

[RE]IMAGINE EDUCATION

A weekly Design.AI newsletter



REIMAGINING LEARNING AND COMPUTING WITH AI

Senior Lecturer Natalie Agus, ISTD

*In Conversation with Dr. Qian Huang, LKYCIC and
Dr. Nachamma Sockalingam, OSP*



This week's issue features Dr. Natalie Agus, Senior Lecturer at the Information Systems Technology and Design (ISTD) pillar, SUTD. A proud alumna of SUTD, Natalie brings a rare blend of academic rigor, digital creativity, and student empathy to her teaching. She teaches foundational courses like Data-Driven World and Computation Structures, and leads advanced courses in Game Design and Development, shaping students' computing journeys across all levels. What sets Natalie apart is how she integrates AI not just into her content, but the process of how students manage time, ask questions, and learn.



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*This newsletter is produced with ChatGPT and other AI tools as super-collaborators. The authors contribute the core ideas, drafts, strategic framing, pedagogical insights, and design direction, while AI supports creative articulation.
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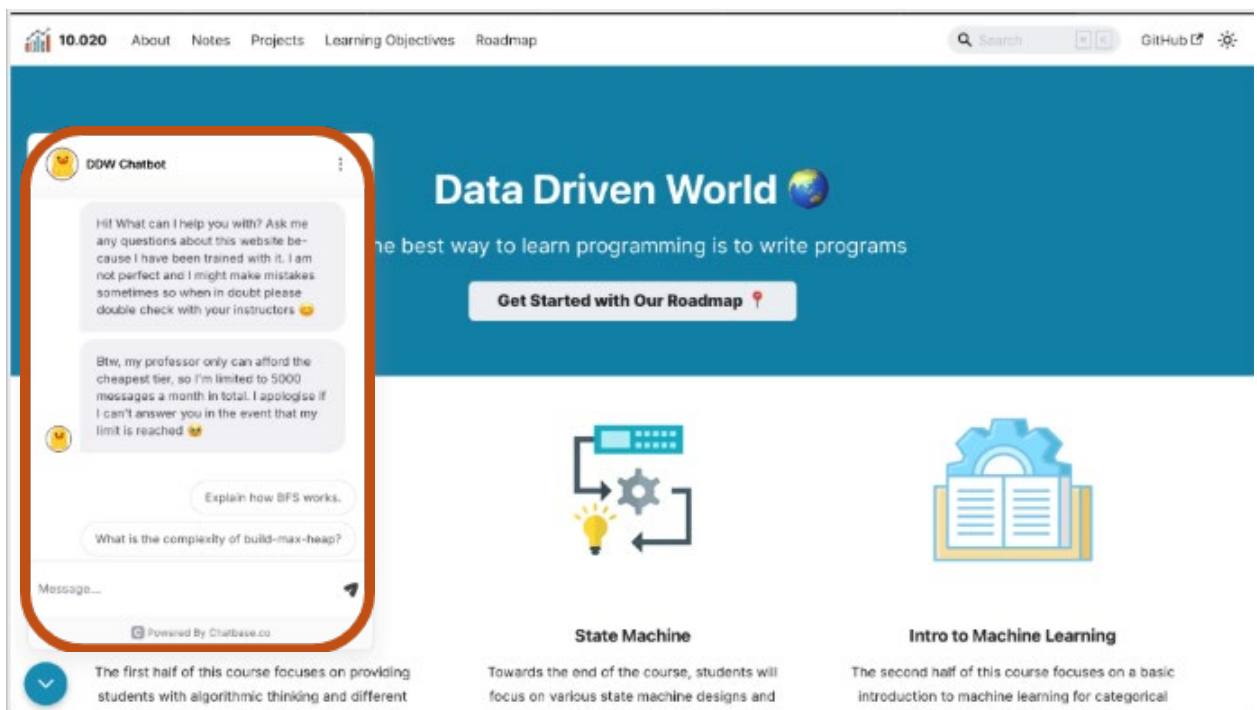
Dr. Nachamma Sockalingam, Office of Strategic Planning



Pioneering AI Chatbots: Pedagogical Insights

Long before ChatGPT became a household name, Natalie Agus was already exploring the frontier of AI-enhanced education. Drawing inspiration from student feedback and classroom challenges, she began experimenting with AI agents using platforms like Chatbase. As early as three years ago, she created custom AI chatbots embedded directly within her course websites, transforming static lecture notes into dynamic, interactive learning tools.

Check out the current Data-Driven World course site, which includes the Chatbot (on the left in picture below)



As a result, students could pose questions anytime, reducing barriers for those hesitant to speak up in class. Initially, engagement was so high that question quotas were maxed out monthly. But over time, usage tapered. Some students preferred videos over bots, while others asked only surface-level questions.

The insight gained from this experience was that AI tools must be meaningfully and pedagogically integrated, not just technically deployed, to stay relevant. Natalie noted that students' usage preferences and patterns change with technology trends. She emphasizes aligning tools with course objectives, learner behaviour, and motivational scaffolding.



Changing Dynamics: Working with AI

The rise of ChatGPT is shifting the learning dynamics even more.

“Students now come to office hours with better questions,” she notes.

Why? Because they have already asked ChatGPT the simple ones.

Rather than seeing this as a loss of direct interaction, Natalie frames it as a new sequence of learning:

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1. Student ↔ AI – for initial idea exploration and low-stakes help

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2. Student ↔ Student – for peer feedback and collaboration

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3. Student ↔ Teacher – for high-level guidance and conceptual clarification

This layered approach allows students to build confidence privately, before engaging publicly—a crucial shift for learners hesitant to “lose face” in front of teachers.

Learning Is Changing: From Memorization to Abstraction

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In a world where AI can recall any fact, Natalie argues that abstraction rather than just memorization and knowing is the true currency of 21st-century learning. She explains that “AI can give you all the knowledge in history or geography—but you need to distil it, connect patterns, and ask what it really means.”

This philosophy underpins her entire teaching strategy. Whether students are studying how to execute instructions or how Python structures data. Natalie’s goal is not rote recall—it is helping them transform knowledge into insight.

Teaching with Empathy, Connecting with Students

From embedding chatbots in course sites to rethinking learning dynamics, Natalie models empathetic and intentional pedagogy. Her approach is not only AI-aware—it is human-centered. Informed by these, she redesigned her courses using a flipped learning model—pairing pre-recorded lectures and AI chatbots with in-class time dedicated to hands-on projects, consultations, and deeper discussion.

Far from replacing human interaction, AI in Natalie’s classroom frees up time for it. By offloading repetitive tasks like content updates or proofing lesson materials, she reclaims time for mentorship, project work, and face-to-face consultations. In an era where automation often feels impersonal, Natalie flips the script: AI lets her be more present, more responsive, more human. .



"AI takes care of things that would otherwise take me hours, such as proofreading. Now, I have more time to meet my students face-to-face. This approach lets me prioritize what matters most: that personal connection", she explains.

Scoping Ambition with AI: Making Project-Based Learning More Realistic

Natalie extends her AI-enhanced pedagogy into project management as well. In her Game Design and Development course, students take on the challenge of building a playable game within a 72-hour "game jam" midterm.

But before the coding marathon begins, she sets a critical checkpoint: students must vet their game idea and project management with ChatGPT.

"I told them—run your concept through the AI and see if it actually fits within 72 hours," she says. "That includes sleeping, eating, and debugging time."

The AI becomes a reality check, helping students critically evaluate the feasibility of their ideas and avoid overly ambitious pitfalls. It supports the shift from just thinking big to thinking wisely, a vital design and life skill.

AI in Grading: A Multi-Agent Check on Bias

Natalie also leverages AI in her grading. Grading design and programming work can be subjective and time-consuming. Natalie takes an innovative approach: She evaluates first, and simultaneously submits the same student work to three different AI models, such as Claude, Gemini, and ChatGPT, and compares their evaluations to her own.

"If their grades tally with mine, it gives me confidence that I am not biased and have been consistent over time," she says.

This triangulated method helps identify outlier cases needing closer review while maintaining grading fairness. Yet, human judgment remains essential. Natalie is the evaluator, but AI helps her check her grading patterns. This is a creative way of checking human bias using AI, while there is an ongoing debate about the bias of using AI to grade. It is how we use AI.

Designing with Empathy, Teaching with Intention

Natalie's work offers a compelling model for educators navigating the AI era. We need to continually explore, experiment, evaluate, and meaningfully integrate technology in teaching. Her methods are not driven by trends, but by thoughtful responses to real student needs. Starting small, building on, infusing technology in multiple aspects of teaching, and being creative, she reminds us:

"AI is not a shortcut to good teaching—it is a tool for augmenting and amplifying what matters in good teaching."