



# The AI-READY TEACHER

Strategies for Building Adaptive  
Expertise

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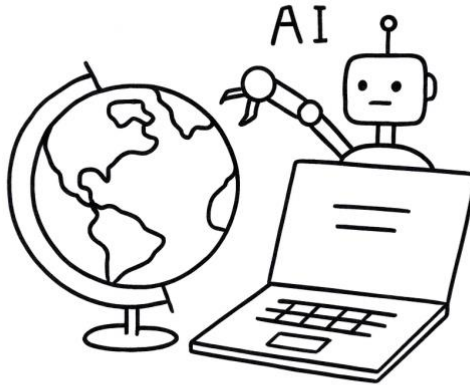
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## Introduction

The world of AI is advancing at a pace we've never witnessed with any previous general-purpose technology. Since OpenAI released ChatGPT on November 30, 2022, we've been watching AI-driven changes unfold almost daily. In education, the ripples keep spreading. We've moved from outright denial and blanket bans to reluctant acceptance to, in some cases, genuine enthusiasm. Whether you see this as threatening or promising, I'm optimistic about generative AI's potential in education and research. I've made it my work to help teachers navigate this landscape and make thoughtful choices about integration.

Given how new this technology is and the pressure on teachers to climb the learning curve quickly, confusion is understandable. Most teachers assume that using AI effectively means collecting tools. I know this firsthand because my social media posts featuring AI tool roundups get far more engagement than anything else I share. But simply stockpiling tools and forcing them into your teaching to prove you're "doing AI" leads nowhere productive. It often creates "[AI Workshop](#)," surface-level integration that looks impressive but doesn't improve learning.



**AI IS CHANGING THE  
EDUCATIONAL WORLD**

My approach centers on developing AI pedagogy instead. This requires building your AI literacy, which rests on three foundations: knowledge, skills, and attitudes. Tools matter, but they're only a small piece of the puzzle. Skills matter more. Without a solid pedagogical foundation, no tool will save you. Think of it this way: handing someone a professional camera doesn't make them a photographer. They need to understand composition, lighting, and storytelling. The camera is just the instrument. The same applies to AI in teaching.

Here's why a tool-focused approach falls short. First, there are hundreds of AI tools available, with new ones launching constantly. You could spend all your time testing tools and

## The AI-Ready Teacher

never teach a lesson. Second, using AI effectively isn't just about technical mastery. It's about pedagogy, about handling the unpredictable moments that arise when students interact with these systems.

As Allen and colleagues (2013) remind us, "classrooms are dilemma-ridden and unpredictable" (p. 115). What works in one situation or with one student won't necessarily work elsewhere. Teachers need to adapt their instruction constantly, responding to the students in front of them and the situations they encounter. This complexity demands flexibility, not rigid adherence to any single tool or approach.

In this uncertain environment, what we need most is the ability to adapt quickly to new developments. This capacity has a name: adaptive expertise (Bohle Carbonell et al., 2014; Hatano & Inagaki, 1986; Fairbanks et al., 2010). Unlike routine expertise, where you get very good at doing the same thing repeatedly, adaptive expertise lets you innovate and adjust when circumstances change.

In this guide, we explore what adaptive expertise means, why it matters for teachers working with AI, and how you can develop it in your own practice. At the end, I've included a section with suggested readings for those who want to explore these ideas further.

## What is Adaptive Expertise?

Bohle Carbonell et al. (2014) define adaptive expertise as the “ability to quickly get accustomed to change” (p. 15). As for Barnett and Koslowski (2002), adaptive expertise is the ability to transfer knowledge and reasoning to novel situations by applying deep, theory-based understanding. Adaptive expertise, they further argue, is characterized by flexibility, conceptual depth, and the capacity to generate new solutions beyond familiar contexts.



Lin and colleagues (2005) describe adaptive expertise as a form of ‘metacognitive expertise’. They explain that the metacognition teachers need is very different from the tidy, step-by-step strategies usually taught in standard programs.

Those approaches assume stable problems and predictable environments, which is rarely the case in classrooms. Students bring different goals, backgrounds, and assumptions, and lessons unfold in ways that can change from day to day. Because of this variability, teachers need what the authors call adaptive metacognition: the ability to revise their thinking, reconsider their intentions, and adjust the learning environment itself, not just monitor the steps of a problem-solving routine.

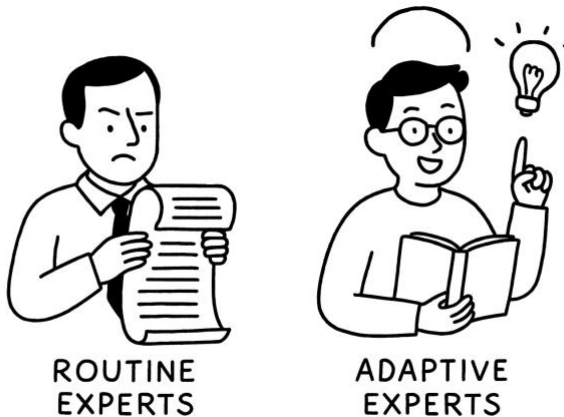
Put simply, adaptive expertise is the capacity to navigate the unpredictable nature of classroom life. Anyone who has taught knows how quickly things can shift: a lesson takes an unexpected turn, a student challenge appears out of nowhere, or a new AI tool produces outcomes you didn't anticipate. Routine expertise helps you keep things running on a normal day. Adaptive expertise helps you respond when the normal day disappears.

### **Routine Experts vs Adaptive Experts**

Researchers have long noted that expertise does not grow along a single path. Hatano and Inagaki (1984) described two distinct trajectories: routine expertise and adaptive expertise. Both develop through repeated engagement with a domain,

but they diverge sharply in how knowledge is organized and used.

Routine experts become highly efficient at familiar tasks. Through repetition, they refine procedures until they can carry them out quickly and accurately. As Holyoak (1991) put it, “routine experts are able to solve familiar types of problems quickly and accurately” (1991, p. 310). The catch is that this efficiency breaks down when conditions shift. When the problem looks unfamiliar, when the usual strategies no longer apply, routine experts often stall. Their knowledge is tied to procedures rather than underlying principles.



Adaptive experts work differently. They also build fluency, but they continually question, compare, and revise their understanding. Hatano and Inagaki (1984) trace this back to Piaget’s idea that learning deepens when people examine how

variations in action lead to variations in outcome. They emphasize that curiosity and the search for meaning fuel this form of expertise: “in order to understand, it is necessary to systematically examine the effects of variations in action upon outcome” (p. 7). Adaptive experts do not simply perform a skill; they investigate it.

This difference becomes most visible when the environment presents novelty. Bohle Carbonell and colleagues (2014) explain that both routine and adaptive experts can perform flawlessly in familiar conditions, but “the difference becomes apparent once confronted with an unfamiliar situation” (p. 15). Routine experts struggle. Adaptive experts draw on a more flexible knowledge base that helps them recover quickly. Their understanding includes why a method works, when it applies, and when it should be replaced.

Holyoak (1991) captures this contrast neatly: adaptive experts “may be able to invent new procedures derived from their expert knowledge,” a level of originality he sees as marking “true expertise” rather than “mere skill acquisition” (p. 240).

For us teachers and educators, the distinction matters every time a lesson unfolds in an unexpected direction, every time a student raises a question that wasn’t part of the plan, and now, every time AI produces an outcome that demands a new judgment. Routine expertise helps when the day runs

## The AI-Ready Teacher

smoothly. Adaptive expertise helps when it doesn't, and classrooms rarely offer many smooth days.

Here is a table I created to highlight the key differences between routine expertise and adaptive expertise in everyday teaching.

## The AI-Ready Teacher

<b>Routine Experts</b>	<b>Adaptive Experts</b>
Rely on well-practiced procedures that work in familiar situations.	Use deep, conceptual understanding to respond effectively to new or unfamiliar situations.
Perform tasks quickly and accurately when conditions match past experience.	Recover quickly when routines fail because they understand why methods work and when to change them.
See variation as a disruption that complicates performance.	Treat variation as information that helps them refine or rethink their approach.
Knowledge is tied to specific tasks and contexts.	Knowledge is organized in ways that allow transfer across contexts.
Struggle when asked to solve problems that differ from their usual repertoire. Holyoak notes they have “modest capabilities in dealing with novel types of problems.” (p. 239)	Generate new solutions and procedures when needed. As Holyoak explains, adaptive experts can “invent new procedures derived from their expert knowledge.” (p. 240)
Focus on efficiency: doing known things well.	Balance efficiency with innovation: improving routines when they no longer fit the situation.
Comfortable when the environment is stable and predictable.	Thrive in complex, shifting environments like real classrooms.
See expertise as mastering a set of skills.	See expertise as ongoing learning, reflection, and revision of understanding.
Tend to default to what worked in the past.	Regularly question assumptions, test alternatives, and adjust based on evidence.

## **Developing Adaptive Expertise with AI: Practical Strategies for Teachers**

I've come to see that developing adaptive expertise with AI has little to do with collecting tools and everything to do with how we think about our own teaching. Tsui (2009) expresses this eloquently when she writes that adaptive expertise grows through “the processes of reflection and conscious deliberation in which practical knowledge is theorised and theoretical knowledge is interpreted in practice” (p. 437).

That line captures exactly what happens when we bring AI into real classrooms. We try something, see what unfolds, question our assumptions, adjust, and gradually build a clearer sense of how AI can support our goals.

With that spirit in mind, here are some practical strategies to help you develop your own adaptive expertise:

### **1. Start with Pedagogical Problems, Not Tools**

I always begin by asking myself what I am trying to solve. Once the problem is clear, I look at AI through that specific lens. This keeps me grounded. It prevents the temptation to force a shiny tool into a project simply because it looks impressive.



## **2. Experiment Deliberately and Pay Attention to What Happens**

I like setting small trials for myself. I might use AI-generated feedback for a writing assignment and compare the results with feedback I normally give. When I try that, I pay close attention to what unfolds. Which parts helped students engage more deeply? Which parts created confusion? What surprised me? I jot down quick notes after each attempt. Those notes slowly become a personal archive that sharpens my judgment about when AI carries value and when it doesn't.

### **3. Focus on Principles Before Procedures**

I stopped trying to memorize every prompt template or workflow. Instead, I work on understanding why AI behaves the way it does. For example, I think about how large language models rely on probability rather than truth, which helps me anticipate moments when the output might sound right but miss the mark. I pay attention to how a slight shift in wording changes the response I get. These principles travel with me from one tool to another, which makes me less dependent on tutorials and far better prepared for new updates.

### **4. Compare Outputs to Sharpen Your Eye**

I often ask AI to generate several versions of an explanation or question set. Then I sit with those versions and study the differences. Which one is clearer? Which one would work better for my task? Which one supports deeper reasoning? This simple routine helps me develop a sharper instinct for quality.

### **5. Engage the Ethical Questions as They Arise**

Before you integrate an AI tool in your instruction, try to pause and ask yourself what a particular use of AI might imply. Does this activity reduce student agency? Does it unintentionally privilege students who have access to AI at home? Does the speed of AI create a temptation for students to avoid productive struggle? These questions don't always lead to clean

answers, but they will keep you grounded in your values as a teacher. They will also help you adjust your use of AI so it aligns with what you care about.



### **6. Treat Failures as Learning Moments**

Plenty of your AI experiments will probably fall flat. When that happens, try not to abandon the idea immediately. Ask yourself where things drifted. Was the task unclear? Did the AI output mislead the students? Did you misjudge where students were in their understanding? These moments will give you raw

material for learning. They will also build your confidence in adjusting, revising, and trying again.

## **7. Learn With Other Educators Who Are Also**

### **Experimenting**

I learn a lot from teachers who test ideas, share their classroom stories, and talk openly about what worked and what didn't. Listening to how others frame problems helps me see my own practice with fresh eyes. Conversations like these keep me from getting stuck in narrow routines and open up new possibilities I wouldn't have imagined alone.

## **8. Revisit Your Approaches Regularly**

Try to look back at your AI use every few weeks and ask simple questions. Is this still helping my students? Has the tool changed in a way that shifts how I should use it? Are my routines slipping into autopilot? This reflection will definitely keep your practice active. It will also help you catch early signs that you're relying on a method that no longer fits the class in front of you.

## **9. Balance Speed With Understanding**

AI makes many tasks faster, but speed isn't the goal. When you use AI to draft a lesson plan or generate feedback, take time to revisit the underlying reasoning. You want to understand why

a suggestion aligns with your goals. You want to stay connected to the pedagogical moves behind the surface. That balance helps you keep your professional judgment intact while still benefiting from AI's efficiency.

### **10. Build Your Own Decision-Making Framework**

I keep a short set of guiding questions for myself. What problem am I solving? How does this tool support the learning goal? What will I gain or lose from this choice? How will I evaluate the outcome? These questions form a loose framework that supports flexible adaptation. The framework shifts as I learn, but having it in place gives me a clear starting point whenever I consider bringing AI into a lesson.

So, yes developing adaptive expertise takes commitment and curiosity but the payoff is real. Instead of feeling overwhelmed by the constant stream of tools and updates, you start to feel steady. You become someone who can navigate change with clarity and purpose. And that, in the age of AI, is the kind of expertise that grows with you.

## **Conclusion**

We find ourselves teaching in a moment where certainty feels rare. AI is changing the conditions of learning and the shape of the skills students will carry into their futures. The pace feels unusual. The expectations feel heavier. And the world our students are preparing for looks very different from the one that shaped our own education. Holding on to the same methods we used a few years ago won't help them thrive in this new landscape.

AI keeps expanding what teachers can do. Feedback can arrive instantly. Explanations can be adapted to the needs of individual learners. Complex ideas can open up through examples and analogies that once required hours of preparation. These shifts create room for richer learning experiences and make certain supports more accessible than ever.

Yet possibility brings new challenges. Some students may rely on AI to bypass the deeper thinking we want them to wrestle with. Some tools may compress complex learning into neat outputs that look polished but carry little substance. Unequal access may widen existing gaps. Every new capability arrives with questions that demand judgment, caution, and awareness. Technical skill with tools can help, but something bigger anchors this work: adaptive expertise.

## The AI-Ready Teacher

Teachers have always needed the ability to read unpredictable situations, respond thoughtfully, and carry out decisions shaped by classroom realities. AI heightens that need. As Hayden and colleagues (2013) remind us, “the ability to use reflective practices to guide instructional decisions is one hallmark of teacher quality and expertise, leading to teaching that is adaptive, responsive, and highly effective” (p. 396).

That quality becomes even more central when students use AI in ways we don’t foresee, when ethical dilemmas emerge mid-lesson, or when new tools shift what’s possible from one month to the next.

My hope is to see teachers use AI to lift human strengths: creativity, curiosity, judgment, imagination, and reasoning. These are the engines of genuine learning. AI can support students as they generate ideas, but students still need guidance to evaluate those ideas and extend them. AI can summarize information, but students need to interpret, critique, and apply it. AI can make some tasks quicker, but students need opportunities to experience meaningful struggle where growth actually happens. Adaptive expertise gives teachers the ability to steer these choices with clarity.

Ethical practice sits beside all of this. New boundaries appear when AI enters the classroom: authorship, privacy, fairness, data use, and questions about the role of human effort. These

## The AI-Ready Teacher

areas require what Duffy (2005) calls “adaptive judgments,” choices shaped by values, context, and unfolding conditions. Teachers skilled in adaptive practice learn to slow down, read the situation, and ask the questions that matter. Should this tool enter the task? What does this decision mean for student agency? Does this step promote equity? Does it support the kind of learning relationships we want to build? Ethical wisdom grows through teaching experiences, reflective conversations, and careful attention to the lived reality of students.

The broader work of building adaptive expertise asks for patience, curiosity, and willingness to learn through the classroom itself. It grows from reflective habits, from trying something new and observing what happens, from keeping your core values close while exploring possibilities you may not have imagined a few years ago. And it gives teachers a steady center in a technological landscape that changes quickly.

If there is one idea to carry with you from this guide, let it be this: to leverage the educational potential of AI in your teaching, cultivate the habits of adaptive expertise. This is the path that supports thoughtful judgment, stronger learning experiences, and a clearer sense of direction in a time when so much is in motion.

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