



Empowering Education with AI: The New Teaching Assistant





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The rise of AI in education

The presence of artificial intelligence (AI) has become ubiquitous in our society, and AI is emerging as a transformative force across various industries in the 21st century. Recent advancements, notably the introduction of user-friendly, large language model chatbots like ChatGPT, have enabled broader adoption of AI technologies. This shift provides equitable access to AI capabilities and fosters a culture of experimentation and innovation.

In education, the integration of AI tools has garnered increasing attention, marking a potential shift in how teaching and learning are approached. AI in education has transitioned from early experiments in computer-based tutoring to sophisticated systems offering personalized learning, automated grading, and virtual teaching assistants, revolutionizing the way students learn and educators teach. As AI continues to mature and demonstrate its efficacy, it has the potential to not only enhance traditional educational methods but also pave the way for entirely new approaches to instruction and assessment. Teachers everywhere face a myriad of responsibilities both inside and outside the classroom, and AI tools offer promising solutions for streamlining tasks such as grading, lesson planning, and individualized student support. But the utilization of AI for education has not yet reached its peak. Although AI's potential is increasingly recognized, full integration and optimization of AI within the classroom are still ongoing processes promising further transformations in the near future.

Indisputably, teachers have the most significant impact on student learning. And it is teachers who are increasingly exploring, defining, and leveraging the potential uses of AI both for enhancing their teaching and for revolutionizing students' learning experience.



Research methodology

In the winter of 2023–2024, we conducted 60-minute interviews with 20 teachers from across the United States to better understand teachers' experiences with AI in the classroom. The teachers sampled in these interviews represent different subjects, grade levels, levels of teaching experience, and districts of varying urban cities and socioeconomic status. The sample also includes a diversity of teaching models—some fully remote, others fully in person, while others were a hybrid of both remote and in-person teaching.

Research objectives

Our objective with this qualitative research study was to:

- Capture and synthesize teachers' perspectives on technology in the classroom – including AI pain points, best practices, and areas of opportunity
- Identify potential teacher personas in tech and AI use
- Uncover areas of opportunity for HMH to support teachers with AI use in the classroom and how these needs may vary by persona

Perspectives on AI in educational settings

Teacher perception of AI

AI remains an emerging technology, and many teachers have only recently started to explore its potential as a tool for education. There is also a notable discrepancy among educators when it comes to how they define and classify AI. The term encompasses a wide spectrum—ranging from basic voice-activated assistants such as Siri, which offers limited functionalities, to intricate interactive artificial environments that mediate human connection and customized content generated through personalized prompts (e.g., ChatGPT). Many teachers still see AI as a recent invention, even though they may have been using AI-powered technology for years without being aware of it.

Challenges of AI use for teachers

When it comes to effectively implementing and utilizing AI tools, teachers face a number of barriers that can impede their efforts to integrate these technologies into their classrooms. These barriers range from ethical considerations about misuse to more practical challenges. We have identified the following four major pain points that teachers face when it comes to utilizing AI in education.

1

Lack of professional development and policy: Many educators find themselves navigating this new AI terrain without clear guidance or established pathways for professional development. When it comes to AI, uncertainty prevails regarding both where to access reliable information, and which sources are most suitable for classroom use. And while educators eagerly await professional development days focused on AI, they are left grappling with a lack of clarity on available resources and best practices and are uncertain about how to proceed in the interim. When teachers wish to discover AI tools but lack formal administrative support and professional development training, they often turn to informal channels (e.g. word of mouth or social media). They, then, explore the functionalities of these tools independently—through platforms such as Facebook, X, and YouTube, and use online resources such as tutorials to determine the effectiveness of each tool.





2

Learning considerations: Some teachers have expressed the worry that by using AI tools, they may be perceived as taking shortcuts or relying too heavily on technology instead of honing their own instructional skills and engaging directly with students. Teachers also express an analogous worry about student learning: Student reliance on AI-generated content could inadvertently foster a student culture of shortcuts and over reliance on AI, leading to a reduction in students' critical thinking.

3

Ethical considerations: The newness of some AI platforms as well as the absence of professional development, regulation policy, and student guidelines for the proper and ethical use of these tools raises concerns about their potential misuses, particularly plagiarism. Teachers raised the concern that students may not be submitting their own work, and the use of AI has made it difficult to track the authenticity of some assignments.

4

Job security: Teachers are concerned that in the future, AI could ultimately replace them or constrain their professional scope. While teachers acknowledge that AI assistance could be beneficial, particularly on days when substitutes are scarce or when additional classroom support is needed, many teachers are apprehensive that having AI serve as temporary substitutes can eventually become a permanent solution.

Benefits of AI use for teachers

Despite the challenges teachers encounter when integrating AI into their classrooms, the potential benefits make the effort worthwhile. Though AI usage is still in its infancy, teachers are already successfully harnessing its power to enhance the classroom and learning environment. These benefits typically center around the following four key factors.

Efficiency—AI as a time-saver:

Teachers consider the leading benefit of AI to be its ability to help them become more efficient. Across all grade levels, AI is being used to save time by streamlining tedious tasks and processes such as grading and lesson planning. Teachers are then able to reclaim their personal time and spend more of their workday providing students with individualized assistance or tending to their own well-being.

Feedback in real time:

For teachers, AI's ability to provide them and their students with instant feedback on student assessments and writing assignments makes AI tools invaluable to the classroom. Real-time feedback allows teachers to be more adaptive and to address student needs and issues as they occur, and provides teachers with a more immediate understanding of each student's circumstance.

Access to information for teachers and students:

AI tools are providing teachers and students with access to more information than ever before, enabling teachers to tailor instruction to individual student needs, identify areas for intervention, and track progress with greater precision and efficiency.

Engaging and current content:

Teachers often have difficulty keeping students engaged in learning activities, especially when students find the materials currently provided to be outdated or irrelevant to their personal interests. Students learn best when they are given information they can relate to, and AI tools allow teachers to tailor materials and content to relevant student interests, which makes it easier for teachers to capture students' attention. By leveraging AI tools, educators can generate learning materials that incorporate references to music, TV shows, popular movies, and social media trends—references that can help contextualize learning concepts in a way that resonates with students' everyday experiences.



AI's role as teaching assistant



Despite the novelty of AI, there's a growing consensus on its specific applications and functionalities for education, with Alexa, Siri, ChatGPT, Diffit, and Writable emerging as prominent choices for integrating AI into education settings. Past research uses four categories—workflow, instruction, communication, and data analysis—to describe how teachers utilize technology within the classroom (Marker et al., 2018). Using those categories, we can track how teachers describe their use of AI and how those uses might interact with recent AI tools and trends—particularly with ChatGPT, which stands out as a leading example even among the most prominent AI tools.



Workflow: Teachers utilizing AI to streamline workflow tasks typically employ various tools for different purposes. ChatGPT is commonly used to generate detailed lesson plans either from scratch or by enhancing existing ones, ensuring they adhere to school-preferred formats along with containing current content. Additionally, ChatGPT assists in creating assessments, while other programs have the capability to grade and provide immediate feedback on student writing assignments.



Communication: Teachers adept at using AI have begun leveraging ChatGPT to enhance how they communicate with parents and colleagues. This includes refining the tone of emails to sound more professional or appropriate, generating templates for future use, editing grammar and punctuation, and facilitating translation for multilingual parents.



Instruction: To support instruction, teachers commonly utilize AI in various forms, including voice-assisted devices like Siri and Alexa for immediate information, ChatGPT for brainstorming, Writable for providing feedback on student writing, and Diffit for creating assignments that cater to different reading levels. Additionally, these tools can be used to integrate relevant, engaging content and materials into lessons.



Data analysis: Teachers have reported only limited use of AI for data collection, storage, and analysis. However, teachers believe that AI holds potential in several areas. This includes automating the transfer of graded content into grade books, developing tools to compile and analyze various performance measures, suggesting adjustments to instructional techniques to address performance gaps, and providing parents with tailored guidance on how to support students given the performance data.

Though teachers may have had some success thus far in implementing AI into their classrooms, more can be done to refine its application, address potential challenges, and maximize its effectiveness in supporting teaching and learning objectives. Empowering teachers to leverage AI tools in the classroom is crucial for the continual improvement of educational practices, as doing so allows teachers to stay at the forefront of educational innovation and address the diverse learning needs and abilities of their students. Ultimately, AI can be used to empower educators and enable them to fulfill their roles more effectively.

Teacher AI personas

Meet our personas

While studying the diverse needs, perspectives, and experiences of educators, we uncovered four different teacher personas, or approaches, for how to use AI within education. The personas were crafted through a combination of examining their perceptions and value of AI, their current usage of tech and AI, and their outlook on AI's benefits and pain points. These teacher personas serve as archetypes capturing the varied profiles and unique circumstances of educators across different contexts, grade levels, and subject areas. By delving into the intricacies of these personas, we aim to foster a deeper understanding of the opportunities and barriers that shape the adoption and utilization of AI technologies in teaching and learning environments.



Digital Pioneer

- Invests in AI tools for potential to improve teaching and education
- Actively uses and researches ways to use AI in education
- Interested in providing students with essential “life tools” and making sure they learn how to use AI safely at an early age



Pragmatic Streamliner

- Focuses on AI tools for potential to save time and make teaching easier
- Open to using AI in any element of teaching that will streamline experience
- Less focused on how AI use can be beneficial for students -- may even be opposed to students using AI



Aspiring User

- Interested in AI tools but faces obstacles in use and implementation
- Researches ways to use AI in education though they may be overwhelmed and lack time or PD to fully implement
- Interested in student benefits with AI but remains cautious on how AI will affect the student learning experience



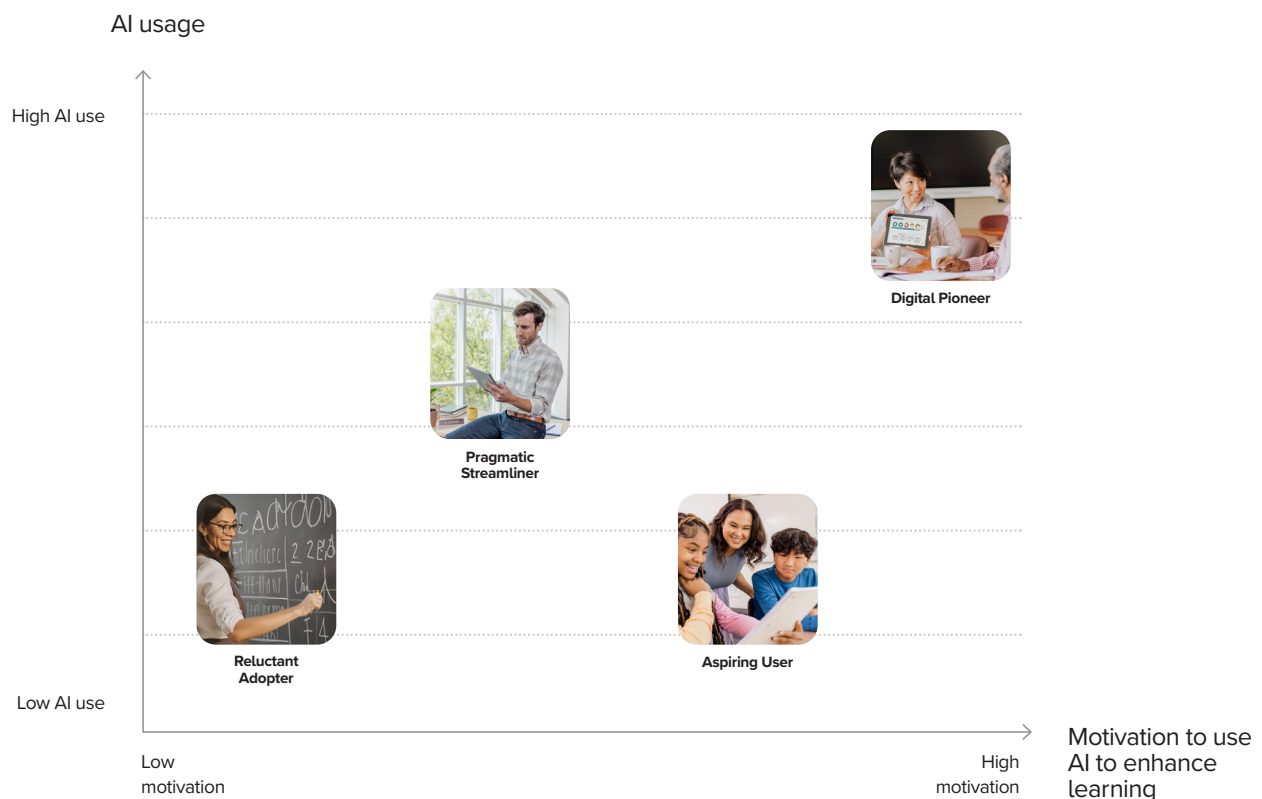
Reluctant Adopter

- Newer to tech/AI tools and more reluctant to learn
- Has distrust towards AI tools and lacks understanding of AI
- See more potential for AI to negatively impact student learning and teaching experience

AI usage and motivation of personas

The graph below shows the relationship between educators' motivation in incorporating AI to enhance students' learning with their actual usage of AI within their classrooms.

- **Digital Pioneers** are highly motivated to learn the newest AI innovations by researching AI tools on their own time outside of school and thoroughly embrace technology in education. Digital Pioneers implement the most recent AI tools through trial and error and can demonstrate how to incorporate the AI tools into their classrooms to other educators.
- **Aspiring Users** are eager to innovate and are interested in learning about AI's capabilities, but they are faced with time and resource constraints that ultimately hinder their usage of AI within their classroom. Although Aspiring Users are open and want to explore AI's capabilities, they lack the time, knowledge, and building blocks to effectively make it a reality.
- **Pragmatic Streamliners** are able to adopt the AI tools provided by the administration with a practical mindset, seeing the tools as a means to streamline and automate their tasks like grading and lesson planning. The Pragmatic Streamliners' main motivation for embracing AI is efficiency and convenience, and they, therefore, readily apply the AI tools as provided.
- **Reluctant Adopters** approach the new AI tools with a level of skepticism, seeing them as a potentially disruptive tool that may undermine essential skills students need to build. Reluctant Adopters may stick with tried-and-true methods and are concerned about AI's impact on students' empathy, creativity, and critical thinking in the classroom.



Key takeaways

As AI tools become more prevalent in the educational sector, teachers will need a solid support system with ample resources in order to effectively integrate these tools into their teaching practices and navigate any challenges that may arise along the way. After consulting with teachers across the United States and considering their unique perspectives, we were able to uncover five best practices (or lessons learned) for how AI tools can be successfully implemented in the classroom while also ensuring that teachers are properly supported.

1

Quality professional development: Despite the increasing presence of AI in education, many educators feel unequipped to maximize its benefits. Left without proper training and guidance, teachers struggle to grasp the capabilities and functionalities of AI tools. To tackle these issues, districts and schools must prioritize comprehensive professional-development training and establish clear policies for implementing AI tools.

2

A universal platform: Teachers find themselves juggling an array of tools, platforms, and resources that each serve a specific function within their teaching practice. While these tools enhance teaching and learning experiences, the fragmented nature of the educational-technology landscape can overwhelm teachers and hinder their ability to leverage these resources effectively. In response to these challenges, many teachers express a strong desire for a universal platform—a one-stop solution that consolidates all essential tools and functionalities into a single interface.

3

Guidelines on appropriate AI usage: Teachers need to provide students with explicit policies and guidelines about AI so that students can better leverage its benefits. Teachers can then promote AI-enhanced teaching and learning while also mitigating the negative effects of students' over reliance on AI-generated content, particularly when it replaces student-created work.

4

Integration with current instructional resources: In an educational landscape inundated with resources, educators often rely on familiar platforms and publishers to provide high-quality materials and support for their teaching. If trusted platforms and publishers integrate AI technology into their established resources, educators will be more likely to view AI favorably—as a credible tool that complements existing teaching practices instead of a disruptive and unfamiliar innovation. This integration would allow teachers not only to leverage AI insights and features within their existing workflows and materials but also to avoid the need for separate AI solutions.

5

Increased engagement and interaction: Teachers recognize that one of the most promising opportunities presented by AI is its potential to enhance student engagement across all subjects and grade levels. Achieving sustained engagement with students can be a formidable challenge, particularly in an era marked by competing demands for students' attention. With its ability to personalize learning experiences, adapt to individual needs and preferences, and offer immersive and interactive content, AI holds immense potential to captivate students' interest.

Conclusion

Teaching is a complex job that requires continually striving to provide rigorous, evidence-based instruction that targets the needs of diverse learners while also meeting state standards, managing students' behaviors, and fostering students' social and emotional learning. Although educators express a range of views about AI and the opportunities and obstacles for its current use, we are hopeful that educators can harness its benefits so that AI becomes a truly personalized teaching assistant that can revolutionize teaching and learning throughout the 21st century.

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