

AI in Teaching @ IU

No one cared about AI until it
came for their bad pedagogy

scale

Leftwich & Justin Hodgson

Faculty AI use versus Student AI use



Faculty Using AI



Students Using AI

Statistics on AI Skills in the Workforce

- Employer Prioritization of AI Skills
 - 75% of employers now prioritize AI-related skills, includes non-technical roles (SF Chronicle)
 - With more 60% prioritizing AI skills over experience when hiring (Microsoft 2024 World Trend Report)
 - Faculty Belief in AI Literacy
 - 86% of faculty believe AI literacy improves job prospects (SF Chronicle)
-





**The future workforce won't
be about humans vs. AI.
It will be about humans who
know how to use AI.**

Embracing AI: Leading the Educational Evolution

- The question is no longer whether AI belongs in education
- The question is how we will shape its role





The Urgency of AI in Higher Education

Navigating AI in Student Learning

- Emily uses AI as a creative partner rather than a crutch.
- AI tools can enhance critical thinking and writing skills.
- The dilemma of AI use vs. innovative learning.
- Institutions must balance AI with traditional education.
- Promoting effective AI engagement fosters student growth.

Is this cheating or innovative learning?

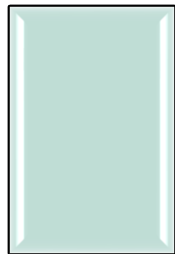


Higher Education at a Crossroads

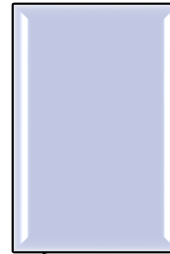
- Generative AI challenges traditional educational models.
- Memorization is not the ultimate goal of learning.
- Three responses to AI: Fear, Indifference, Engagement.
- Universities must adapt to AI's capabilities: Critical thinking and creativity should be prioritized.



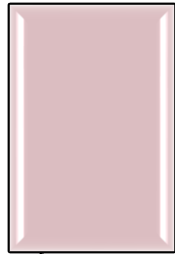
Student Use of AI in Education



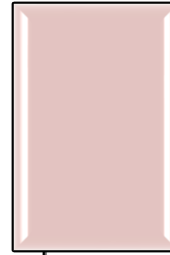
92% of UK undergraduates are using generative AI.



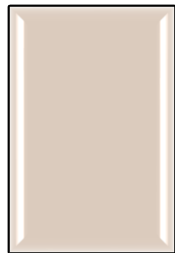
86% of students globally use AI regularly for studies.



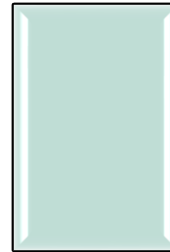
54% of students utilize AI on a weekly basis.



24% report daily AI use for coursework.



51% say AI has improved their grades.

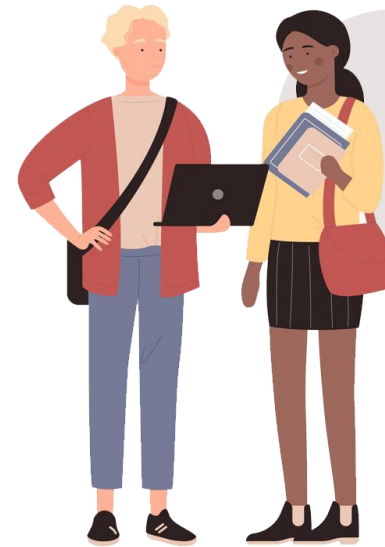


56% believe AI enhances study efficiency.

Student Perspectives

“I delete spaces after periods and purposely misspell words so teachers don’t think my writing was created by ChatGPT.”

“Me too. I also try not to use any sophisticated words, as the AI checkers flag that.”



50%

of students in our focus group reported using *AI Checkers* to make sure their own writing would not be marked as “written by AI.”

"AI is not the enemy of education – it's the catalyst for its evolution."

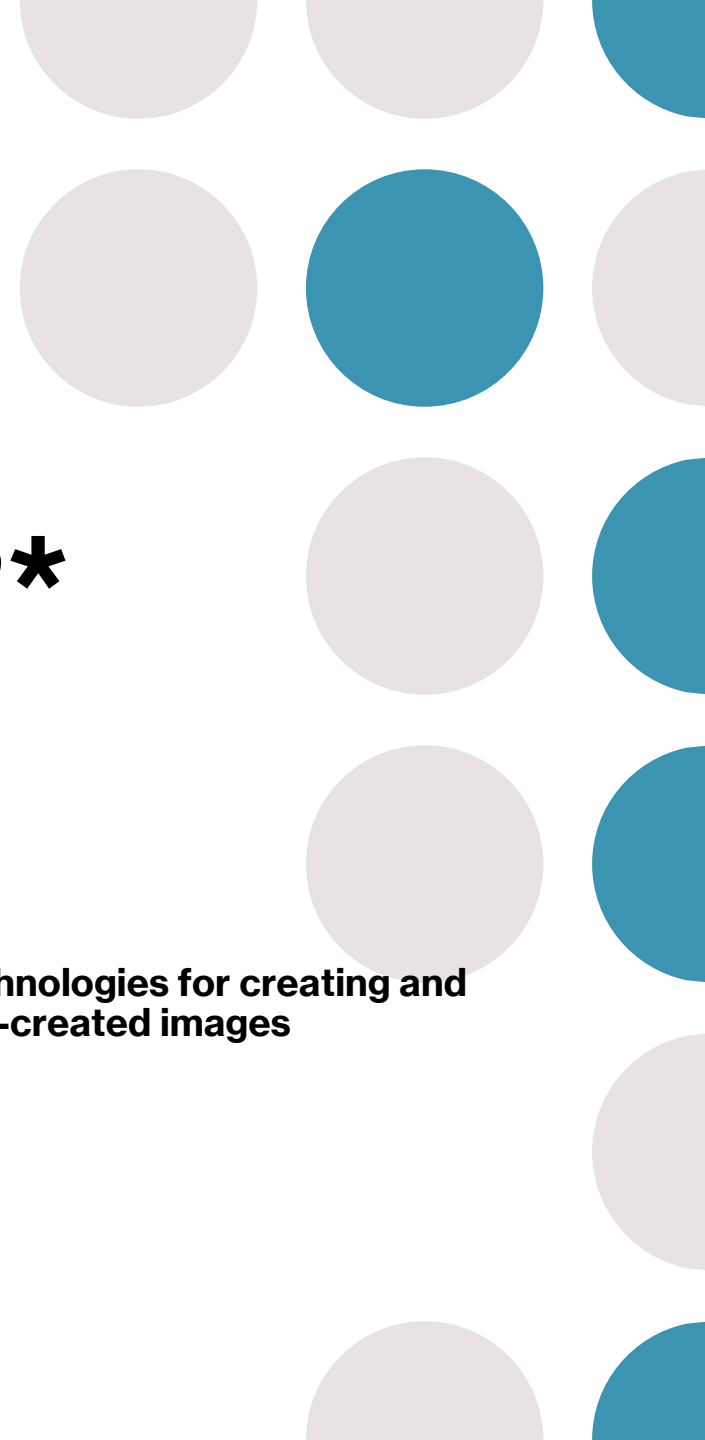
Instead of POLICING AI usage or creating conditions in which students feel the need to introduce errors into their own writing to *prove it was created by a human*, we instead taught them to critically, creatively, and responsibly engage with it?

What if we designed learning experiences where AI wasn't a shortcut, but a tool for deeper exploration?



Is art real?*

***Thanks to Scott Birch in Research Technologies for creating and sharing these Art History images and AI-created images**



1



2



3



4



1



2



3



4



The Changing Role of Faculty in the AI Era



Faculty as AI-Enabled Mentors

AI for role-playing and skill demonstration



I'm a student in a course that has an activity where we're asked to engage in a role simulation exercise to interview prospective applicants. For this activity, I'll be taking on the role of the interviewer and you'll be taking on the role of the individual being interviewed. You'll take on a persona for the candidate given the provided resume information. Since this is a learning activity for me I'll need you to give mostly good answers, but also some not so good ones so that I have a more rounded assessment of the applicant and so it better simulates a realistic interview with a human. Don't break character under any circumstances.

You're Brittanie Sunny, applying to be a Mammography Tech.
Here's your resume:

Submit

AI Usage Among Higher Education Professionals

84% of professionals use AI in personal or professional lives (increase of 32 percent)

61% utilize AI for both personal and professional purposes (35% increase from last year)

Saved faculty up to 40% of course preparation time

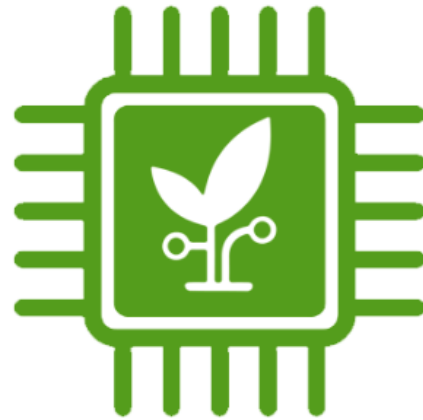
65% of faculty analyze student data using AI

Only 14% of faculty feel confident using AI in teaching

Additional AI Resources @ IU



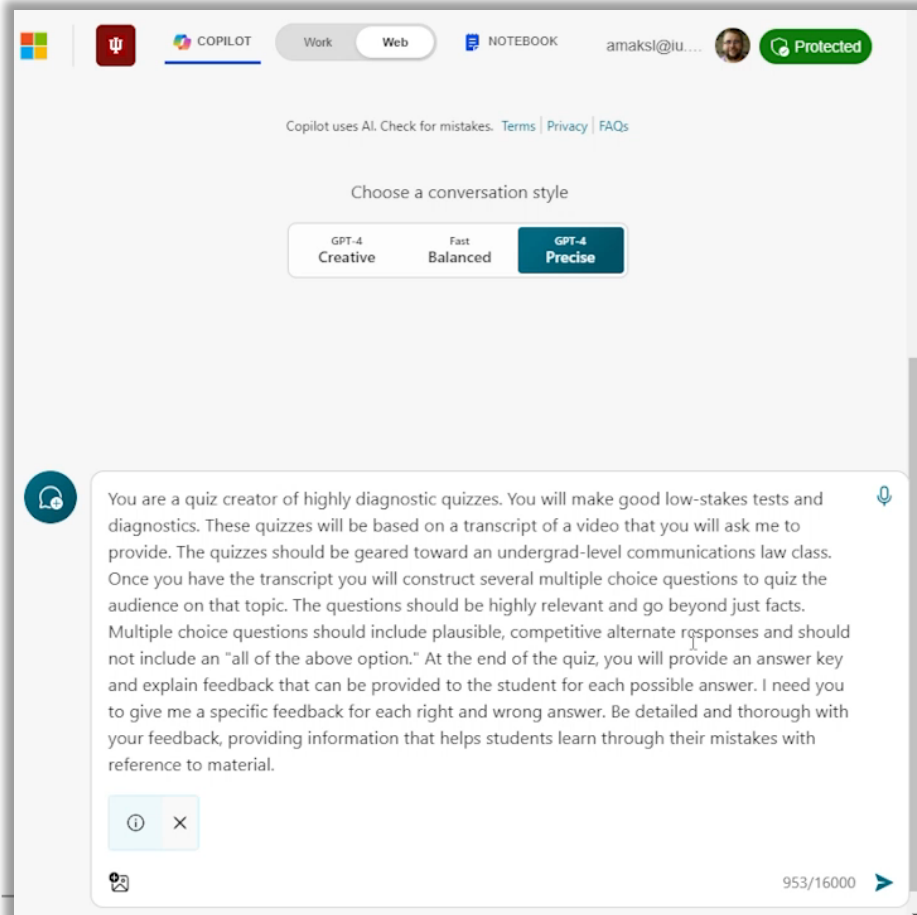
tinyurl.com/GenAITeachingLearning



digital gardener
Ai / Gen Ai Series

Faculty as AI-Enabled Mentors

AI as a teaching assistant



Assist professors in grading

Improve student writing quality

Generate discussion prompts

Adapt course materials dynamically

AI as an Amplifier for Faculty, Not a Replacement

- *Imagine if AI could handle the repetitive tasks—grading, content summarization, administrative burdens—so that faculty could spend more time on what truly matters: **mentorship, discussion, and intellectual growth.***
-

Rethinking Learning and Assessment in an AI-Powered World

If AI can pass our tests, perhaps our tests need to change...



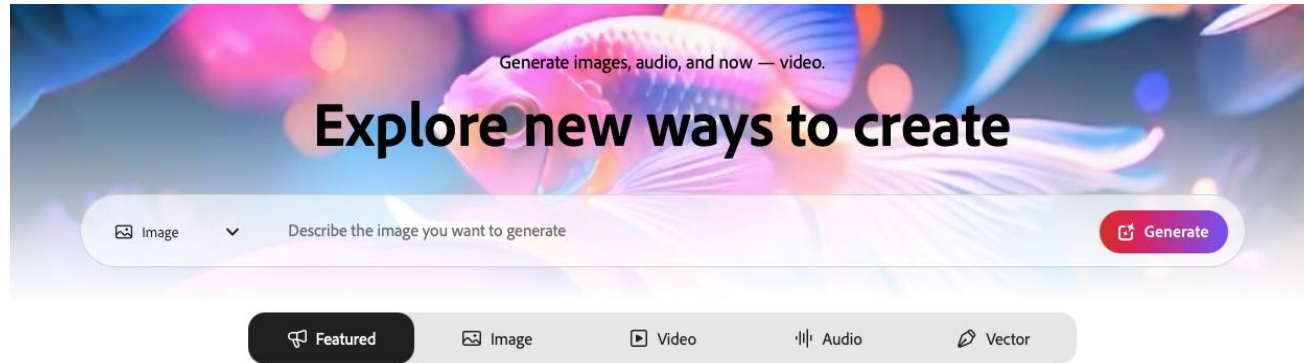


Challenge 1 | Creating Images with Adobe FireFly

- *Accessing Firefly*
- *Demo of moves (basic and advanced)*
- *Select your Challenge Level*
- *Complete the Challenge*



<https://firefly.adobe.com/>



Get creative with Adobe Firefly



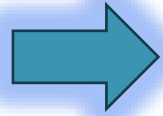
Big bang universe explosion, supernova blast, made out of colorful bath s

 Generate

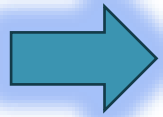
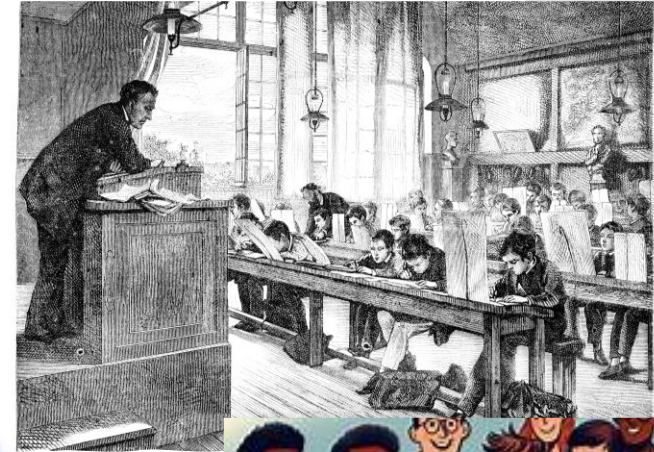
Create with generative AI

Experiment with the latest in generative AI and let us know what you think.

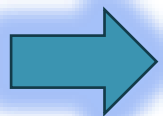
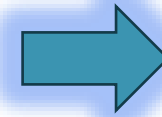
Choose your Challenge Level



Level 1 | Create the Craziest Image you can think of



Level 2 | Try twinning one of these images

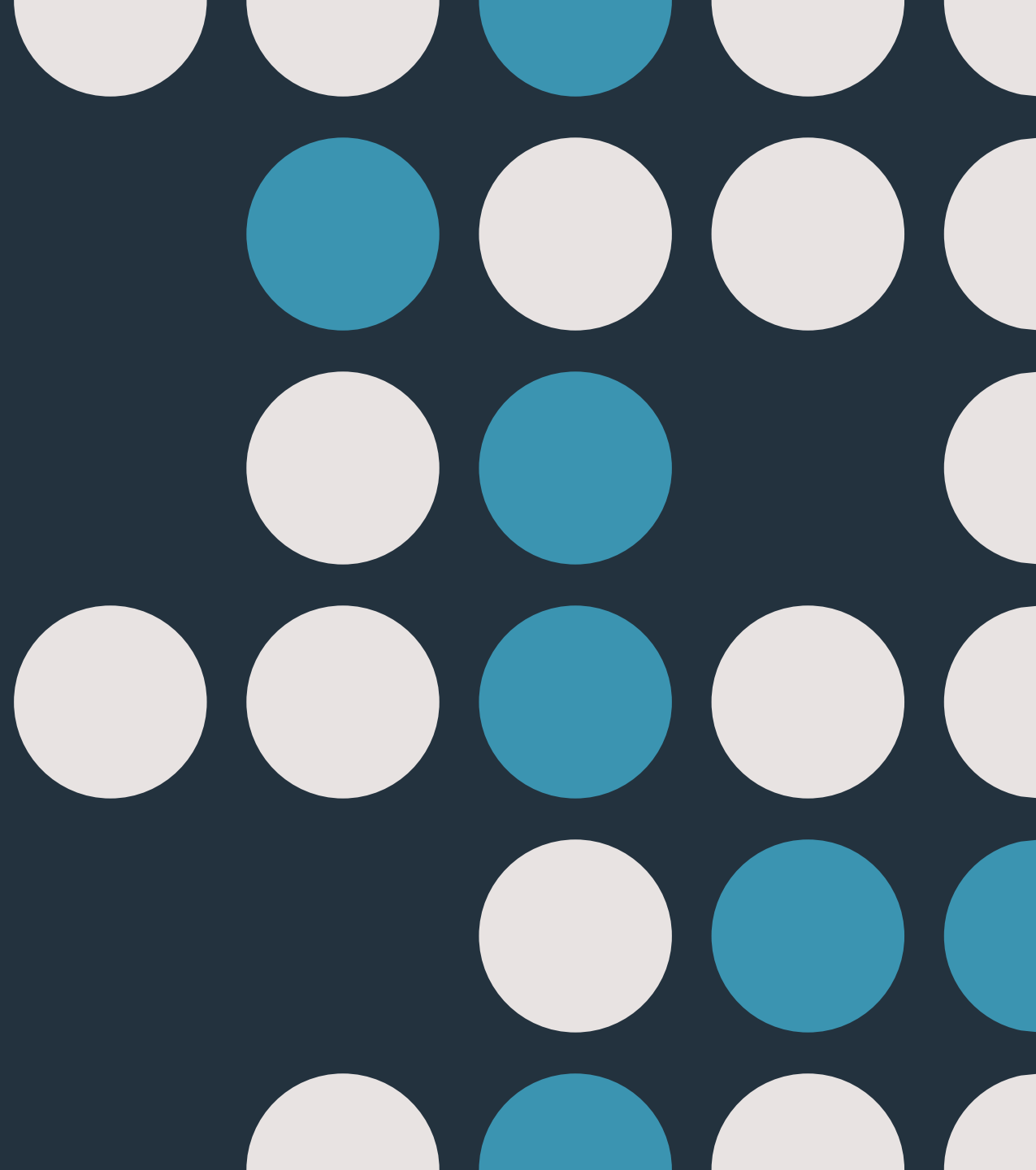


Level 3 | Create an image for a course promo poster

<https://firefly.adobe.com/>

What did you learn?

AI as a Tool for Curriculum Development and Institutional Support



IU's AI Course Modules

Module Content

This module centers on prompt engineering, which involves creating instructions that shape and guide GenAI's output. The aim of this module and prompt engineering is to design precise prompts that achieve the desired results. Incorporating this module into your course can effectively help students use GenAI more intentionally and productively. It will prepare students to use GenAI on specific or general assignments.

Table of Contents

This module includes four content pages:

- **[Basics of Prompt Engineering | About this Module](#)**
This page introduces the module, outlining the learning objectives and key topics covered throughout the module.
- **[Basics of Prompt Engineering | Introduction](#)**
This page emphasizes the importance of crafting specific, well-structured prompts to generate accurate and relevant AI outputs. It introduces key concepts like the difference between general and specific prompts, outlines strategies for effective prompting, and highlights the ability of multimodal AI tools to both consume and produce a variety of content, including text, images, and other data.
- **[Basics of Prompt Engineering | Tips for Effective Prompts](#)**
This page introduces the CORE principles of prompt engineering — Context, Output, Role, and Examples — which guide users in crafting specific and detailed prompts to achieve more accurate and relevant AI responses. It emphasizes the importance of combining these elements to give clear instructions and iterating on prompts to refine AI outputs for specific audiences and purposes.
- **[Basics of Prompt Engineering | Iteration and Revision](#)**
This page emphasizes that prompt engineering is an iterative process, where continuous refinement of prompts is key to improving the accuracy and relevance of AI outputs. It introduces the idea of treating AI as a digital collaborator, providing strategies for giving feedback and revising prompts to achieve better results, while highlighting the importance of being the human in control of the process.

Bringing it all together: Writing comprehensive prompts

To get the most out of AI, combine multiple elements of the CORE principles — Context, Output, Role, and Examples — into a more comprehensive prompt. This approach helps the AI "understand" what you need, who it's for, and how it should present the information.

For example, let's consider the following prompt and explore how the prompt includes all CORE elements.

[Role:] You are a new 8th-grade science teacher. **[Context:]** School starts in one week. **[Output:]** Write a short email **[Context:]** introducing yourself to parents. **[Output:]** This email should be professional but friendly; maybe use an emoji or two. Use some bullets or bolding to highlight key pieces of content and to make the email more reader-friendly. **[Example:]** Some info to include is that you graduated from Indiana University, you won the science fair when you were in 5th grade (that's why you are so into science!), and you love ghost-hunting shows and trying out new pizza places. For teaching, you are very passionate about hands-on learning and building everyday connections.

In this example, each element of the CORE principles is included to ensure that the AI has all the necessary information to craft a tailored response:

- **Role:** Identifying the AI's perspective as a new 8th-grade science teacher helps to frame the tone and content of the email.
- **Context:** Providing context that the school year is about to start and that this email message is intended to introduce the teacher to parents helps frame the purpose of the task.
- **Output:** Specifying that the email should be professional but friendly defines the tone and style of the communication. Adding stylistic elements, like using bullets, bolding, and even emojis, helps define what should be essential elements of the email.
- **Examples:** Including personal details and teaching philosophy offers specific content that should be reflected in the email, helping the AI to create a more personalized and effective message.



Basics | Introduction

Imagine asking a person, "Tell me about business." The response would likely be broad and general, covering a wide range of topics without much depth.

But if you asked, "Can you explain the impact of digital transformation on modern businesses?" you'd get a more focused and detailed answer.

Now, take it a step further. Imagine asking, "Can you provide a three-paragraph analysis of how digital transformation has influenced customer experience strategies in the retail industry, with specific examples from companies like Amazon and Walmart?" With this prompt, the response would be even more targeted and precise, delivering exactly what you need.

The same principle applies to generative AI: the more specific and well-crafted your prompt, the more accurate and useful the output will be. In this module, you'll gain a practical understanding of prompt engineering, a skill that will enhance your academic work and prepare you for professional environments where AI tools are becoming essential. By learning to create effective prompts, you'll be able to generate outputs that are tailored to your specific needs, whether you're conducting research, solving complex problems, or creating content. This skill will set you apart in your studies and equip you with a valuable asset for your future career.



What you'll learn

In this module, you'll gain the foundational skills needed to effectively harness the power of generative AI through prompt engineering. You will enable you to guide AI tools across various platforms — whether you're working with text-based models, image generators, or video-producing AI — to produce accurate, relevant, and creative outputs tailored to your specific needs.

By the end of this module, you will be able to:

- Identify the key elements of effective prompts, using the CORE (Context, Output, Role, Examples) framework, which forms the foundation of prompt engineering.



Basics | Tips for Effective Prompts

The level of specificity in your prompt directly affects the accuracy and relevance of the AI's response. When you provide a vague or general prompt, the AI is left to interpret your request broadly, often leading to outputs that are unfocused, lack the detail needed for practical use, and reflect potential bias present in the training data. On the other hand, detailed and specific prompts give the AI clear guidance, allowing it to hone in on exactly what you need. This results in more tailored and relevant responses that better meet your expectations.

Though there are many approaches to being specific and the detailed, and there's no one "right" way, the CORE principles outlined here — Context, Output, Role, and Examples — provide a structured approach that might serve as a useful mental shortcut as you craft prompts.

C

Context

Provide background information of the task at hand.

O

Output

Clearly and descriptively define what you want the AI to produce.

R

Role

Assign the AI a specific identity or perspective, such as a professional role.

E

Example

Provide examples or reference points to guide the AI's response.

Designing a prompt using the CORE principles

Each part of the CORE principles of prompt engineering can be applied individually, and can also be combined together. Consider these tips:

Context: Setting the scene

- Define the task clearly, including the topic, purpose, and any necessary background information.
- Consider uploading additional documents that you want the AI tool to reference or that you think provide additional background information for the task.
- Specify the intended audience and their level of knowledge or familiarity with the topic.

► [Click here for a Context example:](#)



Using GenAI for Studying and Learning

Imagine you had a personal tutor available 24 hours a day, seven days a week, willing (and even eager) to help you study, struggle through tough concepts, quiz you before exams, and even create practice scenarios tailored just for you. Well, with generative AI, that's not just a fantasy — it's a reality. Whether you're trying to create the perfect set of practice questions or you're hoping to practice what you're learning in a simulated role-playing scenario, GenAI can help. It's like having a study buddy who never gets tired, ready to work at your pace and help you practice applying your knowledge in meaningful ways.

Using GenAI in these ways isn't just about improving your performance in one course or one exam — it's a tool that can support you as a lifelong learner. Whether it's breaking down difficult concepts or generating practice exercises, GenAI can help you situate what you're learning in a way that's meaningful to you, making the material more relevant and applicable to your own life. In this module, you'll learn how to use GenAI to summarize information, generate practice questions, and even simulate real-world scenarios, all tailored to your specific needs. By learning these skills, you'll not only enhance your academic success but also gain valuable tools that will support you in learning throughout your life — long after the course is over.



What you'll learn

By the end of this module you will be able to:

- Identify different ways in which generative AI can be used to aid in various evidence-supported studying and learning tasks and what tools and prompts could be used to enhance academic performance.
- Use GenAI tools to generate summaries, provide alternative explanations, and create study resources that will help to identify and explain key concepts.
- Generate and interact with GenAI-driven role-playing scenarios and virtual tutors to apply concepts in course material to relevant contexts.
- Evaluate the truthfulness of GenAI output and apply strategies to help ensure GenAI tutoring sessions provide the most relevant and accurate output.

The goal of this module is to help you independently apply basic GenAI skills to any studying or learning task to help improve your academic success.

How this module is organized

This module is structured around four key evidence-based studying and learning strategies, each presented as a page here on Canvas.

- **Test preparation and practice questions.** Discover how to use AI to create questions that help you self-assess and pinpoint areas for improvement.
- **Summary and alternative explanations.** Learn how AI can simplify complex ideas and provide different ways to understand them.
- **Relating course content to your experiences, interests, and goals.** Explore how AI can help you connect new concepts to what's important and relevant in your life.
- **Simulations and role-playing.** Apply your learning in real-world scenarios with AI-generated simulations.
- **GenAI as a thoughtful tutor and guide.** Learn how to use GenAI as a personalized tutor that helps you deepen your understanding by guiding you through a series of thoughtful questions.



Test Preparation and Practice Questions

Retrieval: The Secret Study Ingredient

One of the most effective learning strategies you can use to enhance your memory is **retrieval practice**. Simply retrieving information improves long-term learning and memory. In the classic study conducted by Roediger and Karpicke (2006), college students read a brief passage and then reread the passage or engaged in retrieval practice (i.e., writing down everything they remember about the passage). After a one-week delay, memory performance was greater under the retrieval practice condition. **Retrieval Practice** has been studied extensively using a variety of materials consistently indicating this is one of the best ways to strengthen memory (e.g., Agarwal, Nunes & Blunt 2021, Carpenter, 2023, Karpicke & Roediger, 2008, Nickl, & Bühl, 2023, Roediger & Butler, 2011 to name just a few examples).

What is Retrieval?

To begin, you study, view, listen or read through the material you want to learn and then you test yourself on the material. Your goal is to gauge how well you can remember what you have been studying. By bringing the material to mind using "practice tests," you determine how strong your memory is for the material. Often, students misjudge how well they can retrieve information because they experience the illusion of knowing better. Truly practicing **retrieval** is the only way to remember rather than just having a false sense of knowing because you are seeing the material.

Generative AI can assist in this process of practice quizzes quickly. You need a prompt and then indicate your answer and feedback. When using this method, it's the answers first, but rather than you check the accuracy of the recall. Bring and demonstrates learning. Below are some prompts you can create quizzes quickly using.

Creating prompts to

To use GenAI effectively for retrieval practice, you need to create prompts that will guide GenAI to

- **Context:** Using the reading, course material, or a specific topic.
 - You may want to share in your own words others' intellectual property rights.
- **Output:** Describe the type of practice you want.
 - Specify formats like multiple-choice, true/false, or short answer.
 - Be sure to request the tool not to use any university data.
- **Learning Level:** Describe where you are in your learning.
 - For example, mention if you're a beginner or advanced learner.



Summary and Alternative Explanations

Using AI to help with reading

Have you read material for a course and then found you are having difficulty understanding or determining what's important? If so, GenAI can help. GenAI can be used to break down a reading into prose that is easier to understand and can help you to process the material so you can identify the key points of the reading. Using AI to make your reading active is a good strategy to ensure you are gaining what you should from your reading (Hutchinson, 2024).

Extensive research has documented that prior knowledge assists reading comprehension (For a review, see Hattari, Alexander, & Lupo, 2023). It is important to activate your prior knowledge and **connect** it to what you are reading. You can do this in several ways. Begin by spending a moment thinking about the context related to your reading. Noting that you are reading an essay activates a certain structure in your memory. Think about the way the text is organized. Think about what you may already know about this topic. Now you are ready to actively read. |

Whether you're tackling a dense philosophy text or a complex scientific article, the following four-phase approach can be applied to any reading. First, break down the text using key vocabulary and summaries. Then, identify and understand major themes. Next, look for patterns or recurring concepts. Finally, test your understanding using AI-generated questions.

Note that these steps are human-centered, asking you to do work before asking for assistance from GenAI.

Remember, the goal is to develop connections between what you know and what you are learning.

Phase 1

Vocab and Summary

Safe and Ethical Use

When testing out these prompts, you should be aware of the risks that **includes some data protection** issues.

Using the **Microsoft Edge browser** to access web pages and PDFs.

Using other tools **may carry with it** the risk of using a non-IU-supported tool to use any **university data**.

Also, note that **you should not submit** your work to GenAI.



Simulations and role-playing

Interacting with partners—whether it's a professor, a mentor, or a peer—can be one of the most valuable ways to learn, especially when you are asked to apply knowledge and skills in. These interactions push you to apply your knowledge, think critically, and refine your skills based on real-time feedback. However, those partners aren't available 24/7. Their time is limited. And sometimes you might feel hesitant to practice with another person when you're just first learning a skill. That's where generative AI can come in.

With GenAI, you can create interactive, simulated scenarios that allow you to engage in meaningful practice any time you need it. What makes these simulations even more powerful is the opportunity for metacognitive reflection—the process of thinking about how you're learning, reflecting deeply on how you approached the task, what decisions you made, and how you responded to feedback. Then trying again, experimenting with different approaches in a safe environment.

What's more, you can design your AI partner to do more than just play a role and practice; you can ask it to provide feedback on your decisions and actions. The real value of these simulations comes from how well you define the role for the AI, the information it has, and the specific task you ask it to complete. But beyond running the simulation, your reflection on the experience—how you engaged with the AI, how the context shaped the simulation, and how you can improve—plays a critical role in reinforcing what you've learned.

Using GenAI as an interaction partner is not a replacement for practicing with a human, of course. But GenAI-powered simulations offer a safe, low-stakes environment where you can practice applying what you've learned, solve complex problems, and explore decision-making strategies—all without the fear of real-world consequences. What's more, these experiences are endlessly adaptable, meaning you can revisit them again and again, refining your approach and testing out different strategies.

GenAI Simulation Examples

Job Interview Practice: Simulate a job interview with AI as the interviewer, asking specific questions and offering feedback on your answers.

Negotiation Practice: Negotiate the terms of a contract with AI as a tough business partner, helping you refine your persuasive tactics and balancing competing demands.

Crisis Management Simulation: Respond to a public relations crisis where AI simulates media inquiries and customer reactions, helping you practice damage control and strategic messaging.

Historical Event Simulation: Take on the role of a leader during a key historical event, with AI simulating the pressures and decisions, helping you understand why historical choices were made.

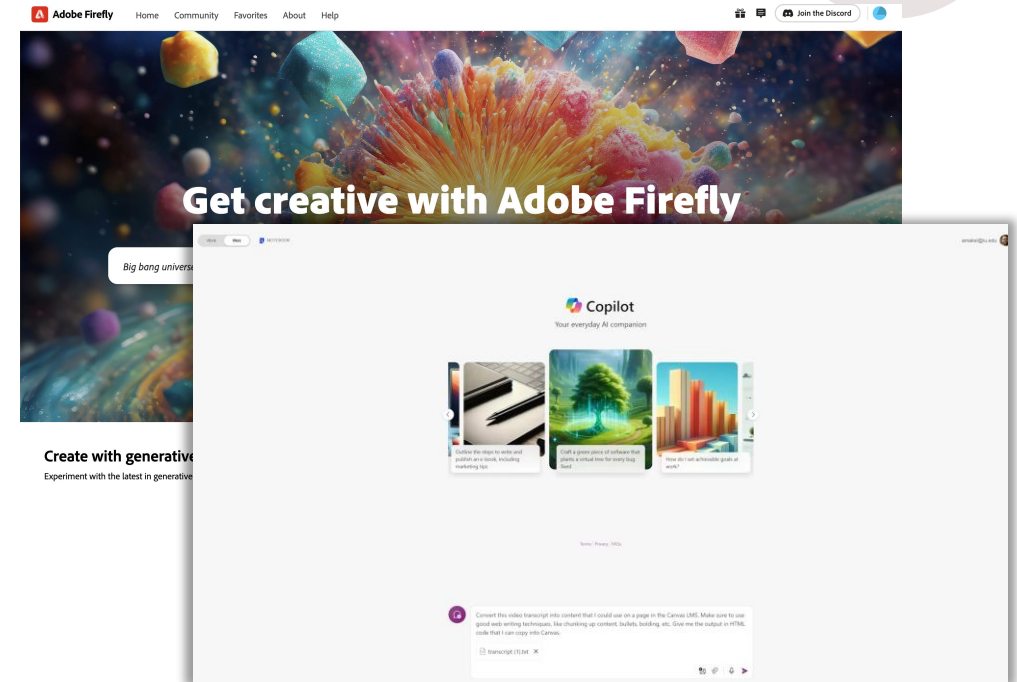
Clinical Diagnosis Simulation: Take on the role of a clinician assessing a virtual patient with AI-generated symptoms, allowing you to practice diagnosing and proposing treatment plans.

Historical Event Analysis: Explore a historical event, like the Treaty of Versailles, and predict outcomes based on decisions you make.

Customer Service Role-Play: Handle a customer complaint, with AI playing the customer and providing feedback on your response.

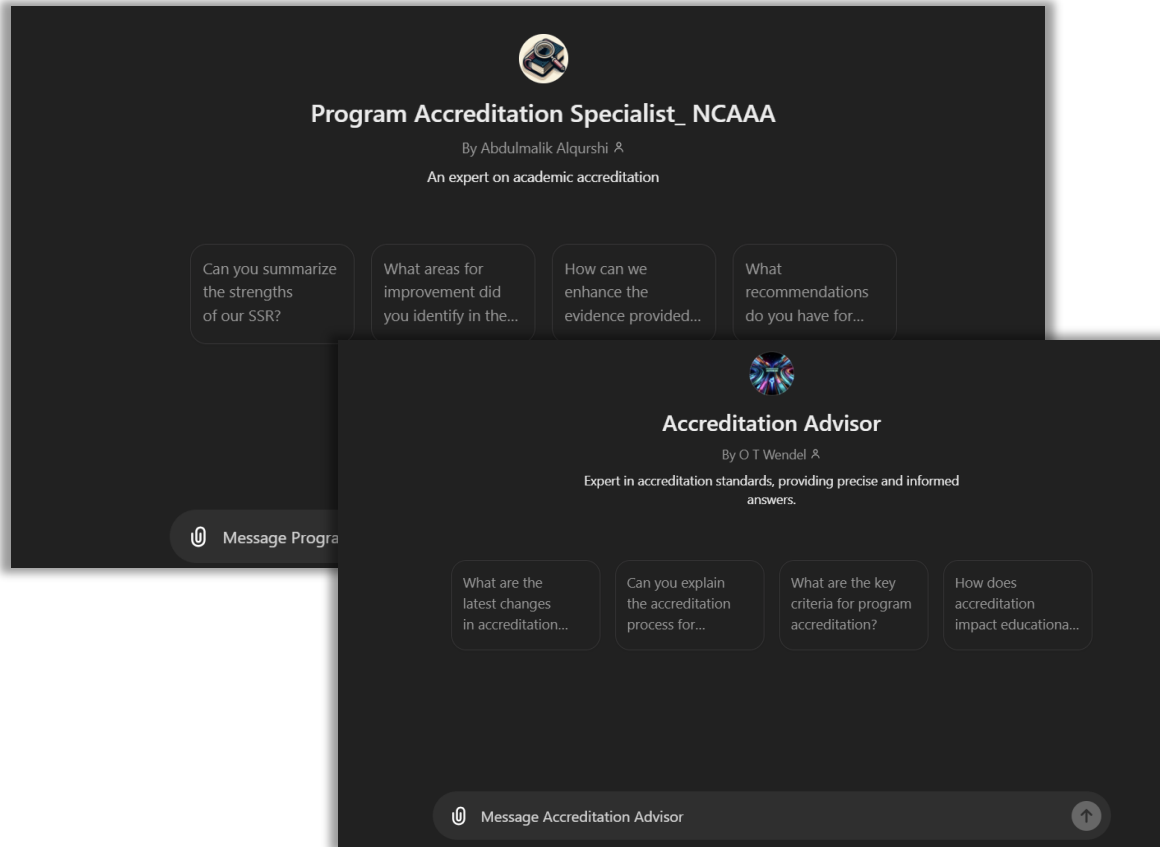
Course content creation

- GenAI can assist in drafting course content, discussion prompts, or study guides, helping faculty create materials more quickly and efficiently.
- It can also help faculty revise content to adjust format
 - Example: Lecture notes → PowerPoint, video transcript → Canvas page, etc.



AI as a Tool for Curriculum Development and Institutional Support

Institutional assessment and reporting



Sample accreditation bots on ChatGPT

- AI can analyze and synthesize large, unstructured sets of data/documents.
- GenAI can help in the drafting of self-study reports.

From 2 years to 29 seconds...

Creating an MBA program structure

I'd like you to take the role of a curriculum advisor for a top tier US MBA program from a leading public university. MBA degrees require learning a lot of classic lessons from multiple business topics and equipping graduates to deal with their future career responsibilities as they advance through management and executive ranks. Consider that the target audience is part-time MBA students in an online program who have 5-20 years of experience and some have domain-specific advanced degrees in other fields. If we assume that the degree is 54 total credit hours and 18 of those are in three, 6-credit blocks called MBA Core1, Core2, and Core3. I want you to advise which topics and in what proportion should be in each of the Core1, Core2, and Core3 courses.



Thought for 29 seconds ▾

As a curriculum advisor for a top-tier MBA program catering to experienced professionals in a part-time online format, it's crucial to design a core curriculum that builds on their experience while equipping them with advanced business knowledge and leadership skills. Given the 18 credits allocated to the MBA Core—divided into three 6-credit courses (Core1, Core2, Core3)—I recommend the following distribution of topics and proportions:

MBA Core1: Foundational Business Concepts (6 Credits)

1. Financial Accounting (1.5 Credits, 25%)

- *Description:* Introduce the principles of financial accounting, including understanding financial statements, accounting cycles, and reporting standards.
- *Rationale:* Provides essential skills for interpreting financial data, crucial for all managerial roles.

2. Data Analysis and Statistics (1.5 Credits, 25%)

- *Description:* Cover statistical methods, data interpretation, probability, and decision-making models.
- *Rationale:* Equips students with analytical tools necessary for data-driven decision-making.

It's all about Prompt Design

Tip 1



**Work
Iteratively**



Tip 2



**ROCKiT
Approach**

ROCKiT

- Role: assign it a role so it operates with a particular perspective or approach
- Objective (or Outcome): describe your goals or objectives: i.e., what you need help doing
- Context: offer relevant context for the role, goal, and/or task
- Knowledge/info: provide additional information, attachments, or content so the LLM has more information with which to work
- Task: tell it what to generate and offer specific steps/guides as appropriate

Example ROCKiT

[Role] You are an instructional designer / curriculum consultant who helps teachers create meaningful and effective assignments that intersect with course learning outcomes.

[Objective] Help me create a multimedia assignment that uses generative AI in iterative ways and allows students to demonstrate knowledge and understanding of course content. The assignment should enable students to meet the specific learning outcome.

[Context] Students are currently working to understand the rhetorical nature of monuments, exploring them through analysis and socio-cultural frameworks.

[Knowledge/info] The learning outcome I want them to engage in this assignment to develop critical thinking skills by applying one of the following 3 concepts from our course reading: The Traditional, Figurative Monument which are monuments that typically represent key figures (leaders, heroes) from a group, nation, culture, etc. designed to offer inspiration or stand for particular cherished values; the Avant-Garde Counter-Monument, which works counter to the traditional frame and offers provocation as a monument rather than consolation or inspiration; and the Site as Monument, which situates actual sites (geographies/locations) of events as monuments (or memorials).

[Task] Offer three possible assignment ideas for this assignment. Once you generate the list, wait for my response to select one of the three prompts before producing the full text of the assignment guide. Be sure to include assessment criteria for the assignment

AI to Support Student Success through Personalized Learning & Support



Student Perspectives

“Teachers should look at GenAI as an enhancement tool.”

“These tools can reduce barriers to creativity.”

“I use ChatGPT to create practice questions for my exams.”

“More professors are starting to help us understand how to use it and that benefits our education.”



Statements from IUB Students
Student Perspectives Workshop 1.31.25
FACET LEADERSHIP INSTITUTE 2023-2025



Traditional Assessments are no Longer Enough

- Students should be assessed on their ability to analyze, refine, and improve AI-generated content.
 - AI-inclusive assessments increased student engagement by 30%
 - 58% acknowledged using ChatGPT
 - 38% admitted using it without teacher consent
-

Custom course-specific chatbots



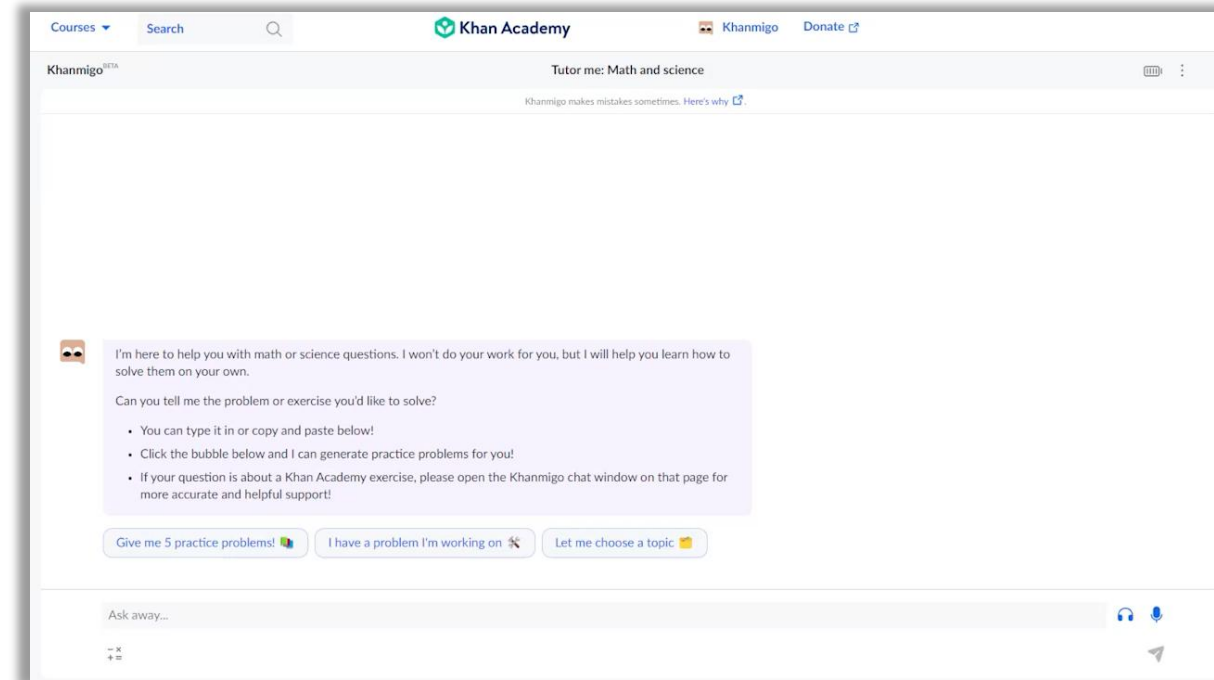
Provide students with course specific-info, integrated into Canvas.



Pointed to specific, trusted sources of information (including Canvas)



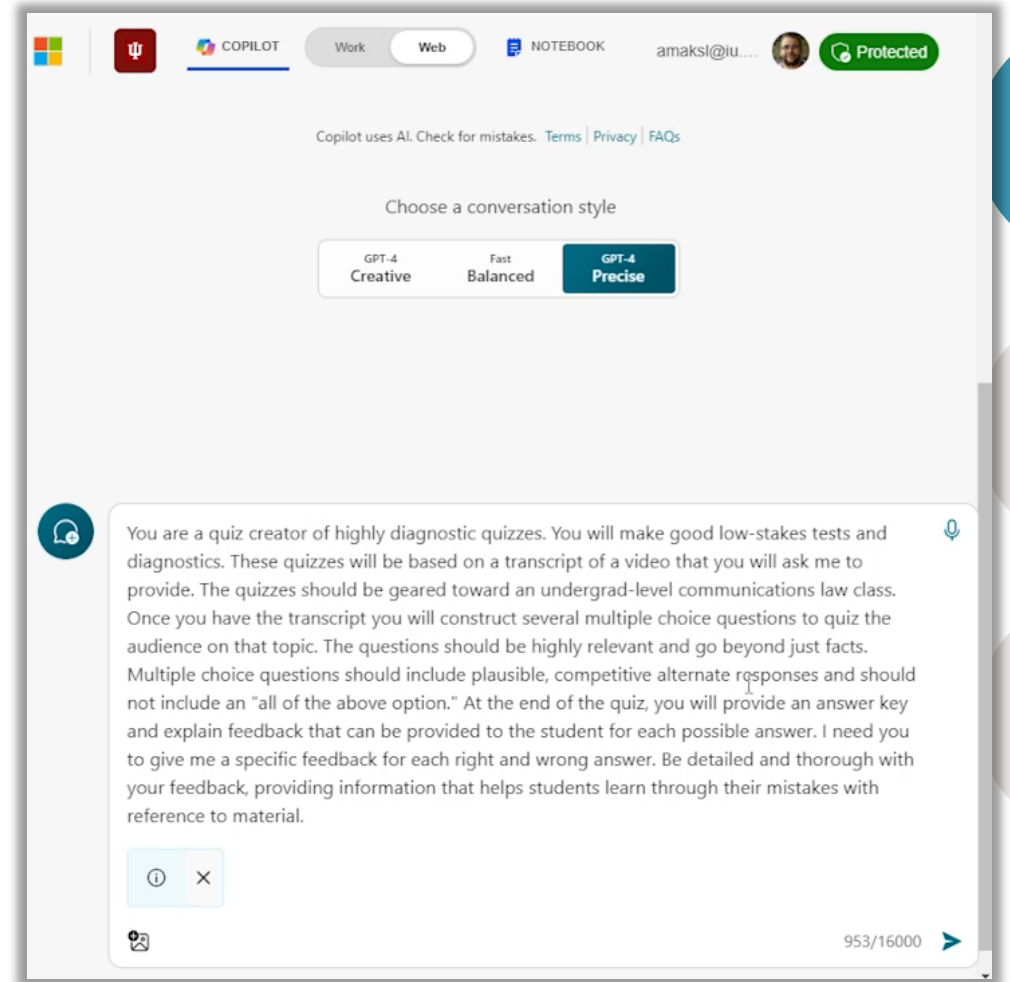
Programmed to guide students to learn concepts, not tell them answers



[Khan Academy Khanmigo](#)

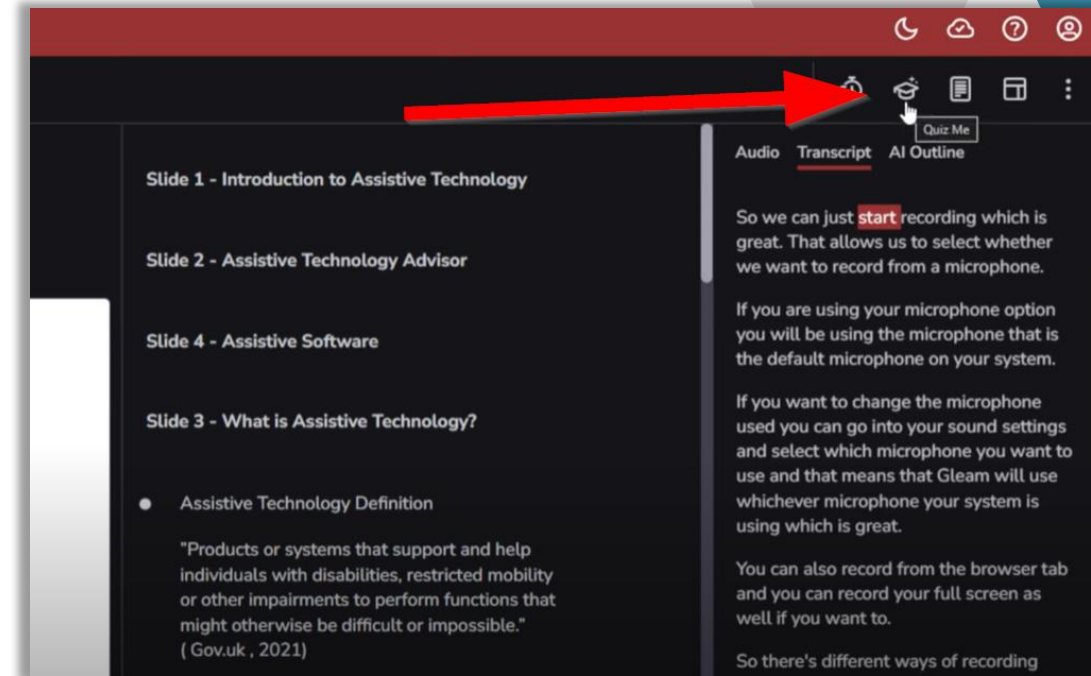
Formative assessments

- Frequent, low-stakes formative assessment is effective but takes significant time to create.
- GenAI can help faculty create practice questions/problems, with *deep feedback* to help students learn.



Formative assessments

- Frequent, low-stakes formative assessment is effective but takes significant time to create.
- GenAI can help faculty create practice questions/problems, with *deep feedback* to help students learn.
- Some platforms allows students to create practice questions from course material.

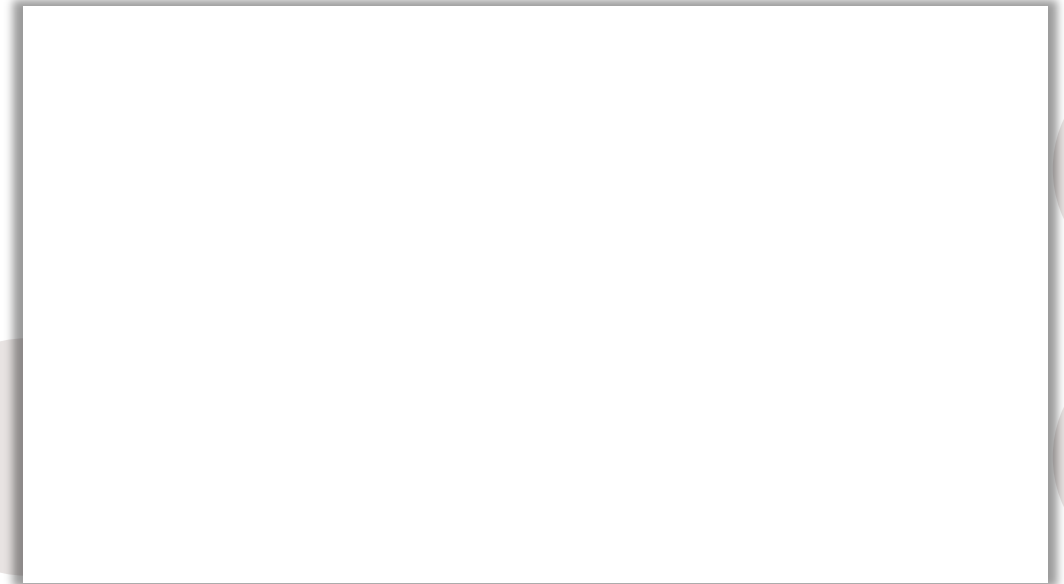


Assistive notetaker software Glean

Streamline and enhance grading process

1. Answer Grouping: Automatically group similar student answers together. Instructors grade a group of similar responses at once

2. AI-Assisted Grading: Multiple-choice or fill-in-the-blank, recognizes patterns and common answers. Speed and consistency of grading.



Automated student support

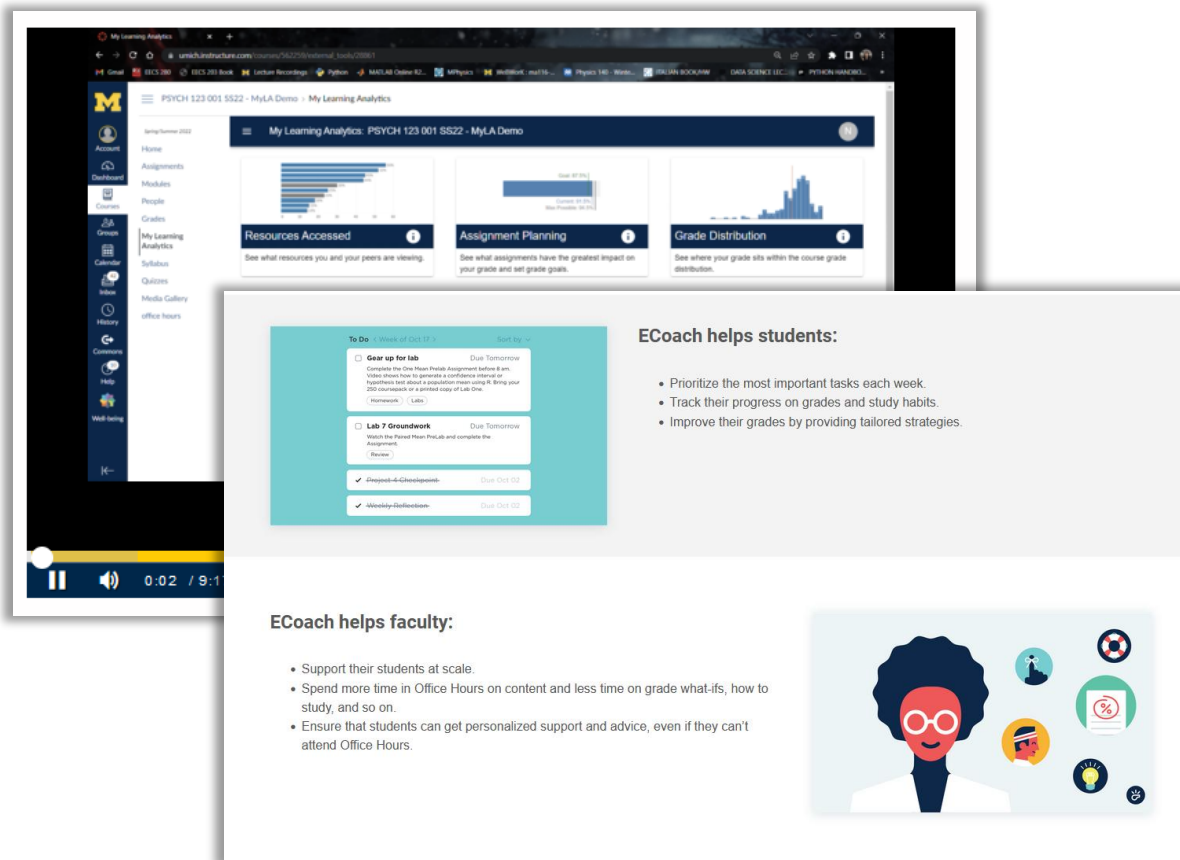
- AI-powered chatbots can offer 24/7 support for non-course academic support,
 - Writing Support
 - Supplemental Instruction
- Chatbots can assist in navigating administrative processes, reducing barriers to success.



Georgia State “Pounce”

AI to Support Student Success through Personalized Learning

Using AI to recognize student needs



- AI can analyze student data and help identify at-risk students, enabling support and intervention
- Empower students by contextualizing that data and through automated coaching help them succeed.

University of Michigan

Ais Role in Scholarship & Research





AI is Reshaping Knowledge Creation and Dissemination

- Reduction in Literature Review Time
- Enhanced Productivity in Technical Fields
- Summaries of Research Meetings
- Dissemination to General Audiences and Media

Turn papers into podcasts

Demonstration

2212.13138 1 / 44 100%

Large Language Models Encode Clinical Knowledge

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Dale Webster¹, Greg S. Corrado¹, Yossi Matias¹, Katherine Chou¹, Juraj Gottweis¹,
Nenad Tomasev², Yun Liu¹, Alvin Rajkomar¹, Joelle Barral¹, Christopher Senturia¹,
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¹Google Research, ²DeepMind

Large language models (LLMs) have demonstrated impressive capabilities in natural language understanding and generation, but the quality bar for medical and clinical applications is high. Today, attempts to assess models' clinical knowledge typically rely on automated evaluations on limited benchmarks. There is no standard to evaluate model predictions and reasoning across a breadth of tasks. To address this, we present MultiMedQA, a benchmark combining six existing open question answering datasets spanning professional medical exams, research, and consumer queries; and HealthSearchQA, a new free-response dataset of medical questions searched online. We propose a framework for human evaluation of model answers along multiple axes including factuality, precision, possible harm, and bias. In addition, we evaluate PaLM (a 540-billion parameter LLM) and its instruction-tuned variant, Flan-PaLM, on MultiMedQA. Using a combination of prompting strategies, Flan-PaLM achieves state-of-the-art accuracy on every MultiMedQA multiple-choice dataset (MedQA, MedMCQA, PubMedQA, MMLU clinical topics), including 67.6% accuracy on MedQA (US Medical License Exam questions), surpassing prior state-of-the-art by over 17%. However, human evaluation reveals key gaps in Flan-PaLM responses. To resolve this we introduce instruction prompt tuning, a parameter-efficient approach for aligning LLMs to new domains using a few exemplars. The resulting model, Med-PaLM, performs encouragingly, but remains inferior to clinicians. We show that comprehension, recall of knowledge, and medical reasoning improve with model scale and instruction prompt tuning, suggesting the potential utility of LLMs in medicine. Our human evaluations reveal important limitations of today's models, reinforcing the importance of both evaluation frameworks and method development in creating safe, helpful LLM models for clinical applications.

Introduction

Medicine is a humane endeavor where language enables key interactions for and between clinicians, researchers, and patients. Yet, today's AI models for applications in medicine and healthcare have largely failed to fully utilize language. These models, while useful, are predominantly single-task systems (e.g., classification, regression, segmentation), lacking expressivity and interactive capabilities [21, 81, 97]. As a result, there is a discrepancy between what today's models can do and what may be expected of them in real-world clinical workflows [42, 74].

Feedback

Transform your content into engaging AI-generated audio discussions

Join the waitlist to experiment with Illuminate.

Join waitlist

Play

Large Language Models Encode Clinical Knowledge

[View Source](#)

Play

Position: Level Operationalized to AGI

[View Source](#)

Code as Policies: Language Model Programs for Embodied Control

[View Source](#)

Play

AI and the Opportunity of Technology

[View Source](#)

The anatomy of a large-scale

Efficient Estimation

Models Encode Clinical Knowledge

00:46 02:28

Making presentations from documents

PATHWAYS TO INCLUSIVE COMPUTATIONAL EDUCATION

Abstract:

This study investigates the integration of computational thinking (CT) into early elementary literacy, focusing on kindergarten to second grade students, using multiple representations to understand their ideas of CT. Through clinical task-based interviews with 12 students, we found that concrete manipulatives, pictorial/graphical representations, and language-based strategies were key to facilitating CT comprehension. The findings indicate no significant gender differences in CT engagement, and instead we need to emphasize the need for inclusive, multi-representational teaching methods in early education. By using multiple representations, we may be able to nurture early STEM interest and confidence in computer science and related fields.

Introduction to the Problem

Importance of BPC in CS Education

Computer science (CS) education is essential for preparing students for the future workforce (Author, 2020). However, CS education lacks inclusivity and excludes certain groups of students, especially historically underrepresented minorities and females (Code et al., 2023). This gap harms the diversity and quality of the CS workforce, and the representation and inclusion of women's perspectives and needs in technology. This exclusion also reduces the potential for innovation and creativity from diverse perspectives in the field (Tissenbaum et al., 2021; Shah & Yadav, 2023).

Addressing the lack of diversity in CS education is not merely a matter of social justice; it is a necessity for fostering innovation and addressing complex global challenges. Diverse teams bring a range of viewpoints and problem-solving approaches, which are invaluable in tackling multifaceted problems in technology and beyond (National Science Board, 2020). Without proactive measures to broaden participation, we risk perpetuating homogeneity within the tech



Create a presentation from
[Special Issue - JRTE \(6\).docx](#)

Here's the outline for the presentation I'm generating:

- Abstract
- Introduction
- Research Questions
- Inclusivity in Computer Science Education
- Computer Science Education in Early Childhood
- Materials and Methods
- Description of Tasks
- Data Analysis
- Theoretical Framework
- Results
- Discussion
- Implications

AI-generated content may be incorrect



Here's a draft of Special Issue - JRTE (6).docx as a presentation.

I've drafted 33 slides and made some changes based on your doc:

- Included speaker notes containing additional details
- Added images to make your deck more engaging
- Applied layouts to organize slides

You can also use **Designer** for adjusting layouts.

AI-generated content may be incorrect



Demonstration

Drafting personalized feedback

I will now **give you some general observations** and you will **create short 1-3 sentence comments** in my conversation **based on the assignment** I share with students. Comments should be **positive, include suggestions, and encourage students to improve**.

 You

new comment. some problems with audio normalization. nice nat sound. avoid the "when asked" transition into acts. use declarative statements to paraphrase what a source says. try to add source info.



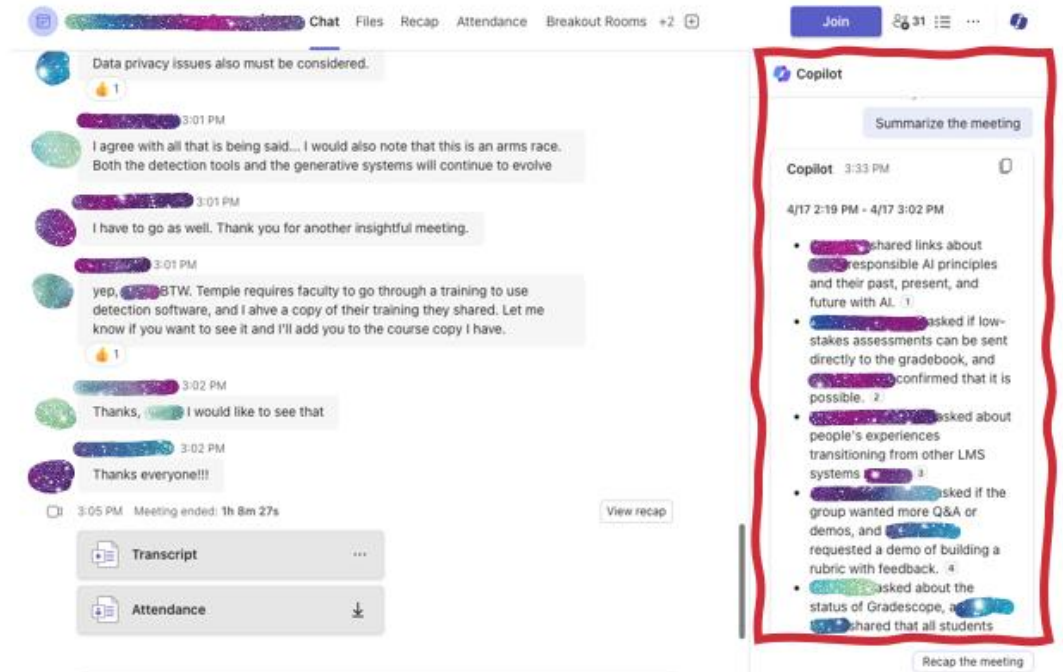
Copilot

"Good start on your audio postcard! There were some issues with audio normalization, so make sure to keep the volume consistent throughout your piece. The natural sound you incorporated was a nice touch! For transitions into acts, try to avoid 'when asked' and instead use declarative statements to paraphrase what your source says. This can make the narrative flow more smoothly. Also, don't forget to include some information about your sources. Keep going, you're doing great!"

- GenAI can help faculty more quickly draft communications and feedback to students.
- The drafts can reference course context and assignment requirements.
- Move from general comment banks to *personalized feedback at scale*.

Automating routine tasks

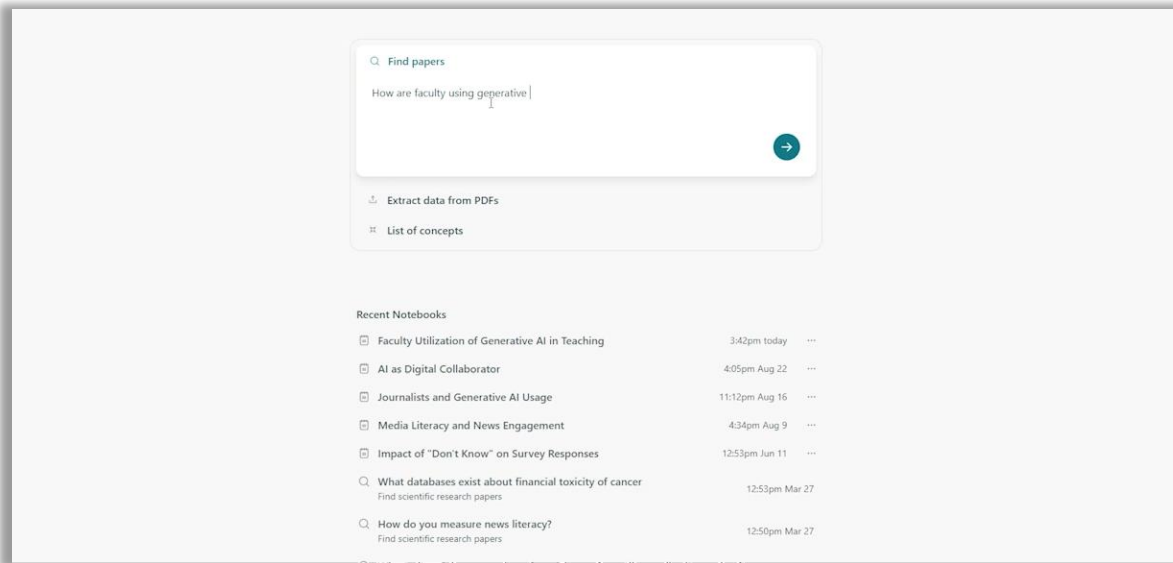
- GenAI can be used to lighten the load in tasks from notetaking, agenda creation, task management, and other time-consuming tasks
- Frees faculty to engage more with teaching and research.



Copilot for Microsoft 365

AI to Enhance Faculty Work

Research assistance



- GenAI can be to find, sort, and organize research.
- GenAI can help to analyze and summarize research materials, leaving more time for faculty to synthesize and interpret literature and data.
- Draft summary research themes from results and/or discussions

Challenge #3 | Social Media

- Brainstorm some potential social media stories that should be shared.
 - Choose a prompt from the list and edit to meet your school or department needs.
 - <https://tinyurl.com/CHEFLC25b>
-



What did we miss?

Thank You!

