

# AI in the Classroom

ACCJC Webinar

April 23, 2025 — 3:00 pm - 4:30 pm PDT

# Welcome!

Please note the following housekeeping items:

- **The chat function will be disabled during this webinar.**
- The session is being recorded and will be posted at [accjc.org/webinar](https://accjc.org/webinar).
- After the event, a post-webinar survey will be available to provide feedback to ACCJC.



*Thank you,  
**Elizabeth Dutton**  
Accreditation Process Director*

# Today's Hosts



**Craig Hayward**  
California Community Colleges Chancellor's Office  
Presenter



**Nickawanna Shaw**  
ACCJC Vice President  
Facilitator

# AI in the Classroom

An ACCJC Workshop

4/23/25

# Agenda

- Who is in the room?
- What is generative AI?
- Why should we care about generative AI?
- How should we use generative AI?

# Who is in the Room?

Quick interactive survey - <https://bit.ly/AI-survey-425>

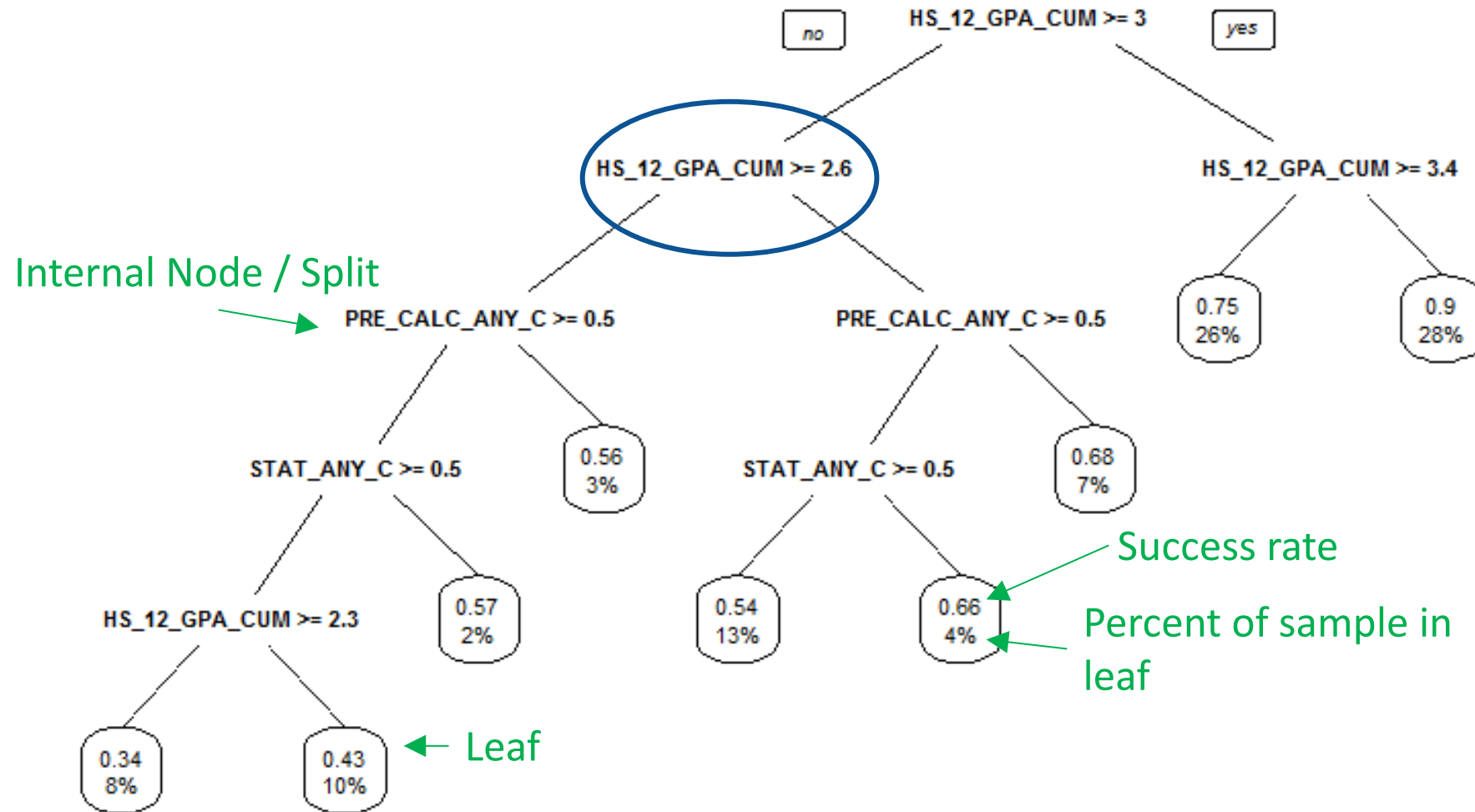
# Your host for this session



- Craig Hayward, Ph.D.
  - Doctorate in Psychology
  - BS in Journalism
- CCC researcher since 2001
- Developed several useful tools:
  - Basic Skills Cohort Progress Tracker
  - Program Pathways Mapper
  - MAP “default rules” decision tree algorithm
  - Developed PPG-1 equity metric for SEA
- Working on
  - Common Cloud digital infrastructure
  - Evaluating applications of Gen AI in higher education
  - The Digital Center for Innovation, Transformation and Equity



# Multiple Measures Assessment Project





What is Generative AI?

# Generative AI (Gen AI) vs. Good Ol' AI

Traditional AI, often referred to as machine learning (ML), has primarily focused on analytic tasks like classification and prediction.

The history of AI development is fascinating and dates back to the 1950's when the term "artificial intelligence" was initially coined. We don't have time to get into it today but there are some great summaries available. I even put a short timeline together here: <https://bit.ly/AI-appendix>

But why is Gen AI so special and how does it work?

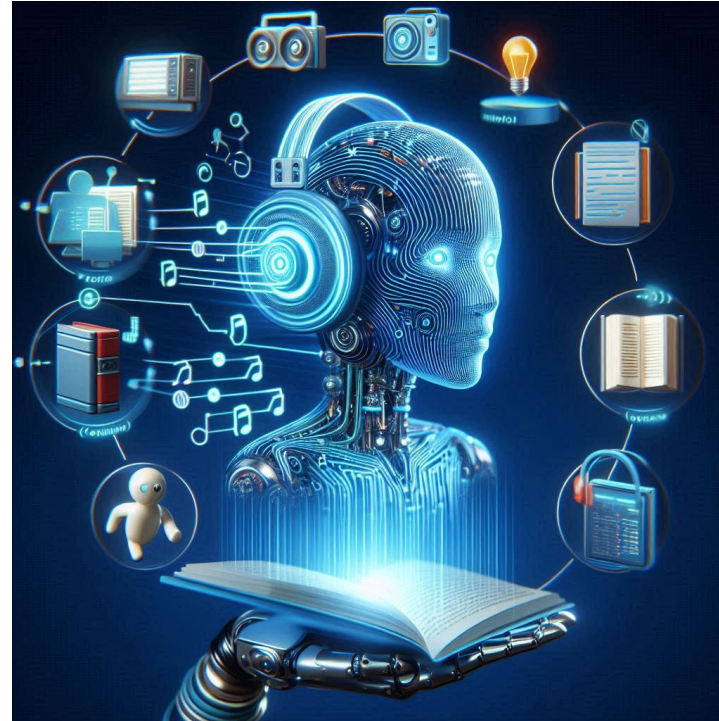
# History of AI, Glossary, etc.

<https://bit.ly/AI-appendix>



# What is Generative AI?

- "Technology that creates new content based on patterns learned from existing data."\*
- It can generate:
  - Text (essays, code, stories)
  - Images
  - Audio
  - Video

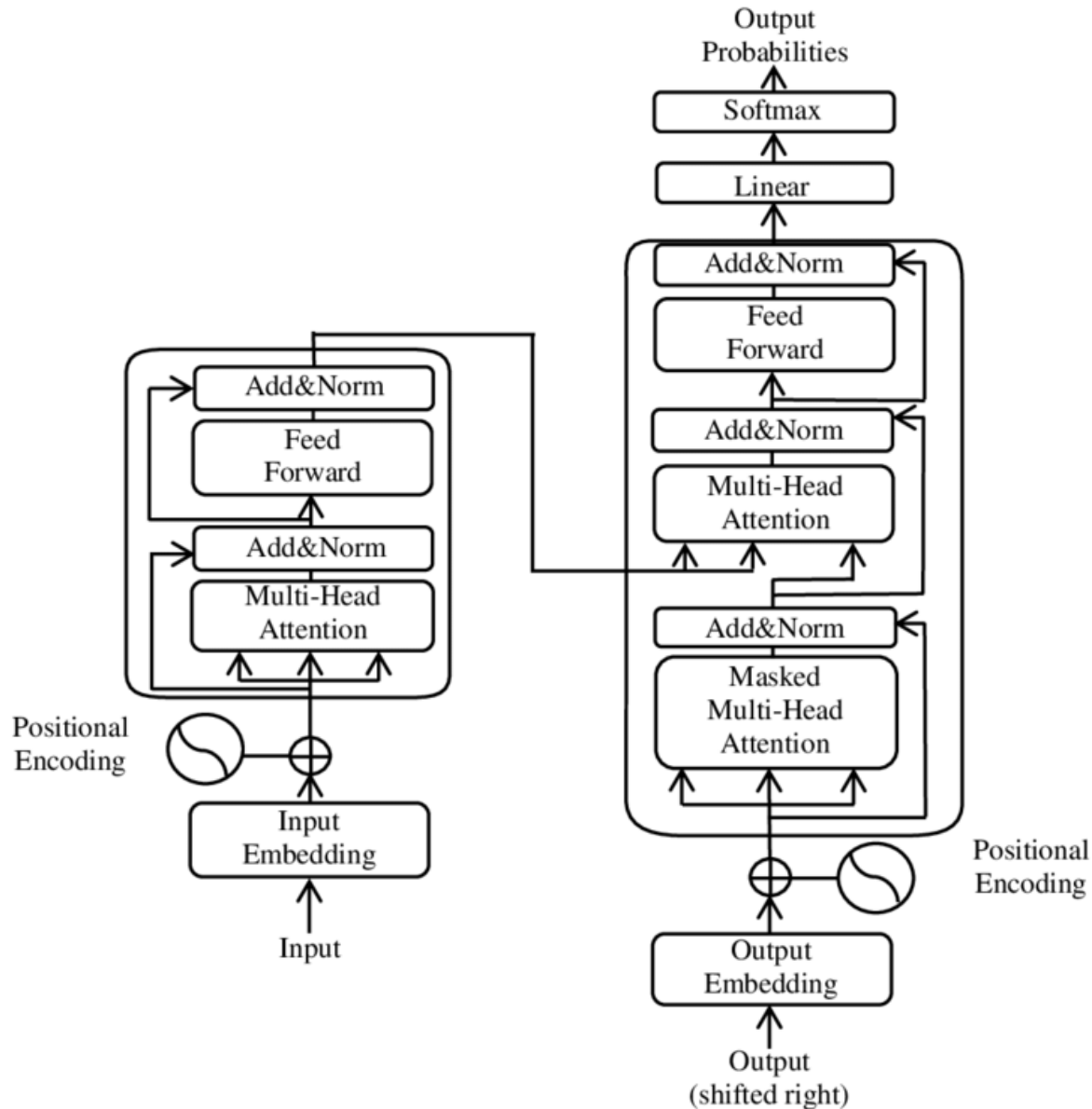


Unlike traditional AI that analyzes, generative AI creates

# More on neural networks

- Generative AI relies heavily on neural networks, specifically a type called "generative models."
- These models learn patterns and structures from massive datasets. Imagine them "absorbing" the essence of the data they're fed.
- Two prominent types are:
- GANs (Generative Adversarial Networks): Two networks work in tandem – one generates content and the other critiques it, leading to continuous improvement.
- Transformers: These excel at understanding and generating text, powering tools like ChatGPT.

# “Attention is All You Need”



"Attention Is All You Need" is a 2017 research paper in machine learning authored by eight scientists working at Google. The paper introduced a new deep learning architecture known as the transformer, based on the attention mechanism proposed in 2014 by Bahdanau et al. It is considered a foundational paper in modern artificial intelligence, and a main contributor to the AI boom, as the transformer approach has become the main architecture of a wide variety of AI, such as large language models.

This paper is now one of the top ten most cited papers of the 21st century, cited over 173,000 times.

# How Does It Work?



Three key steps:

1. Training: AI learns patterns from massive datasets
2. Processing: Uses neural networks to understand relationships and patterns
3. Generation: Creates new content based on learned patterns

# Core Gen AI Technology: Large Language Models (LLMs)

- Process and generate human language
  - GPT-4, for example
- Neural Networks
  - Inspired by human brain structure
  - Enable pattern recognition and generation
- Machine Learning
  - Allows continuous improvement
  - Can be autonomous or include human feedback

# Applications in Higher Education

- **Teaching and Learning:**

- Personalized learning materials
- Automated feedback
- Content creation

- **Research:**

- Data analysis & coding
- Literature review assistance
- Grant applications & research proposal generation

- **Administration:**

- Student support services
- Document processing
- Communications
- Translation
- Robotic Process Automation (RPA)

Why does generative AI matter?

AI makes less experienced employees 34% more productive

# Generative AI at Work

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Erik Brynjolfsson, Danielle Li & Lindsey R. Raymond

New AI tools have the potential to change the way workers perform and learn, but little is known about their impacts on the job. In this paper, we study the staggered introduction of a generative AI-based conversational assistant using data from 5,179 customer support agents. Access to the tool increases productivity, as measured by issues resolved per hour, by 14% on average, including a **34% improvement for novice and low-skilled workers but with minimal impact on experienced and highly skilled workers**. We provide suggestive evidence that the AI model disseminates the best practices of more able workers and helps newer workers move down the experience curve. In addition, we find that AI assistance improves customer sentiment, increases employee retention, and may lead to worker learning. Our results suggest that access to generative AI can increase productivity, with large heterogeneity in effects across workers.

<http://www.nber.org/papers/w31161>

# Time to complete decreases and quality of output increases with AI for writing tasks

Experimental evidence on the productivity effects of generative artificial intelligence

We examined the productivity effects of a generative artificial intelligence (AI) technology, the assistive chatbot ChatGPT, in the context of midlevel professional writing tasks. In a preregistered online experiment, we assigned occupation-specific, incentivized writing tasks to 453 college-educated professionals and randomly exposed half of them to ChatGPT. Our results show that **ChatGPT substantially raised productivity**: The average time taken decreased by 40% and output quality rose by 18%. **Inequality between workers decreased**, and concern and excitement about AI temporarily rose. Workers exposed to ChatGPT during the experiment were 2 times as likely to report using it in their real job 2 weeks after the experiment and 1.6 times as likely 2 months after the experiment.

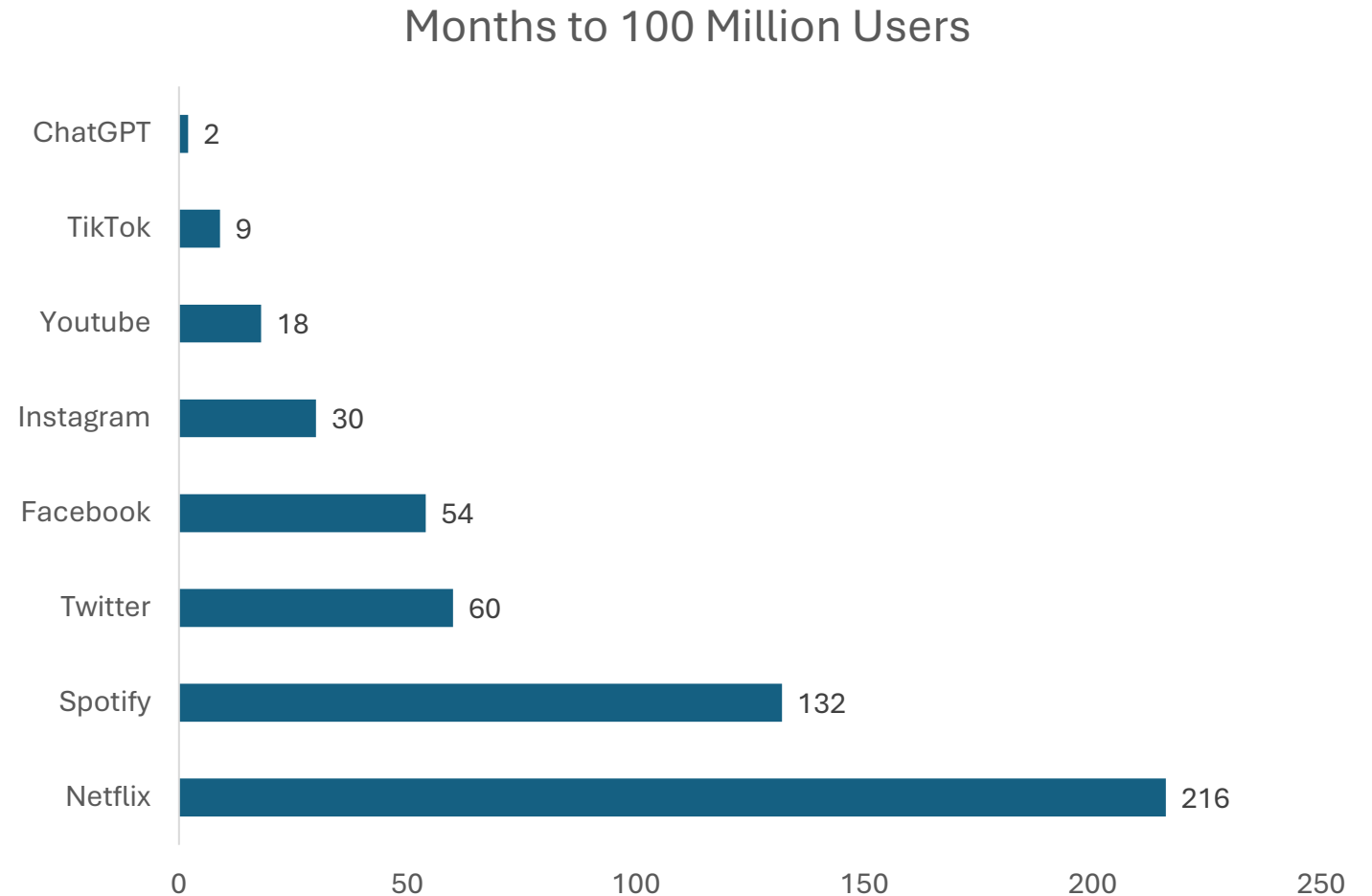
<https://www.science.org/doi/10.1126/science.adh2586>

# RAAM – An acronym for gen AI’s impact

- Rapid evolution/adoption
- Autonomous
- Asymmetrical
- Multidisciplinary

ChatGPT currently has 800 million monthly users.

<https://wisernotify.com/blog/chatgpt-users/>

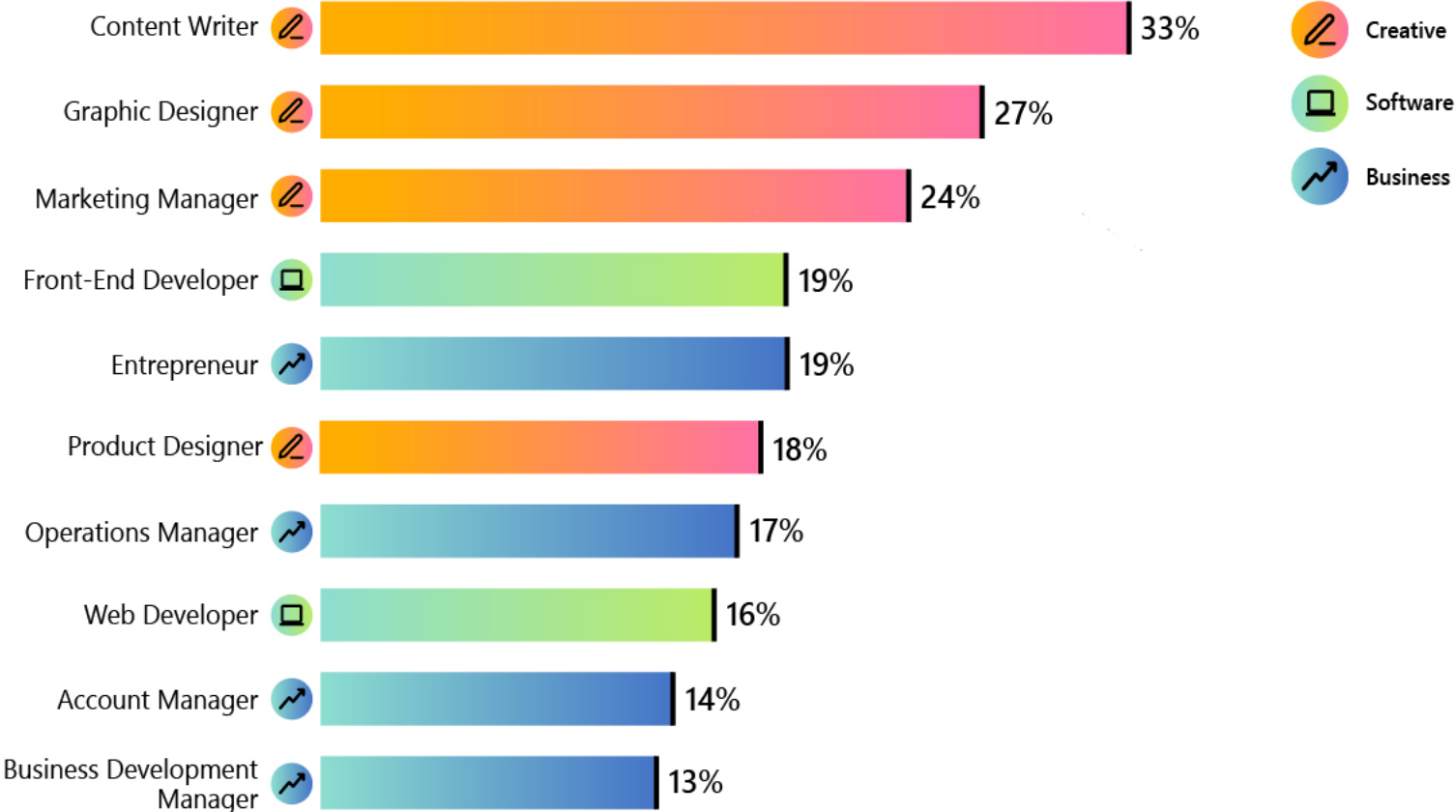


# The Need for AI Literacy

- AI literacy has become a non-negotiable for employers
- According to the 2024 [Work Trend Index Annual Report](#):
  - 66% of leaders would not hire someone without AI skills
  - 77% say AI skills will get new hires greater responsibility
  - 71% say they are more likely to hire a less experienced person with AI skills than a more experienced person without them
- It's not that AI will take your job, rather it's another person with AI who will take your job.

# AI Aptitude Heats Up Across Roles and Industries

AI is going mainstream, and creative professionals are skilling up fast.



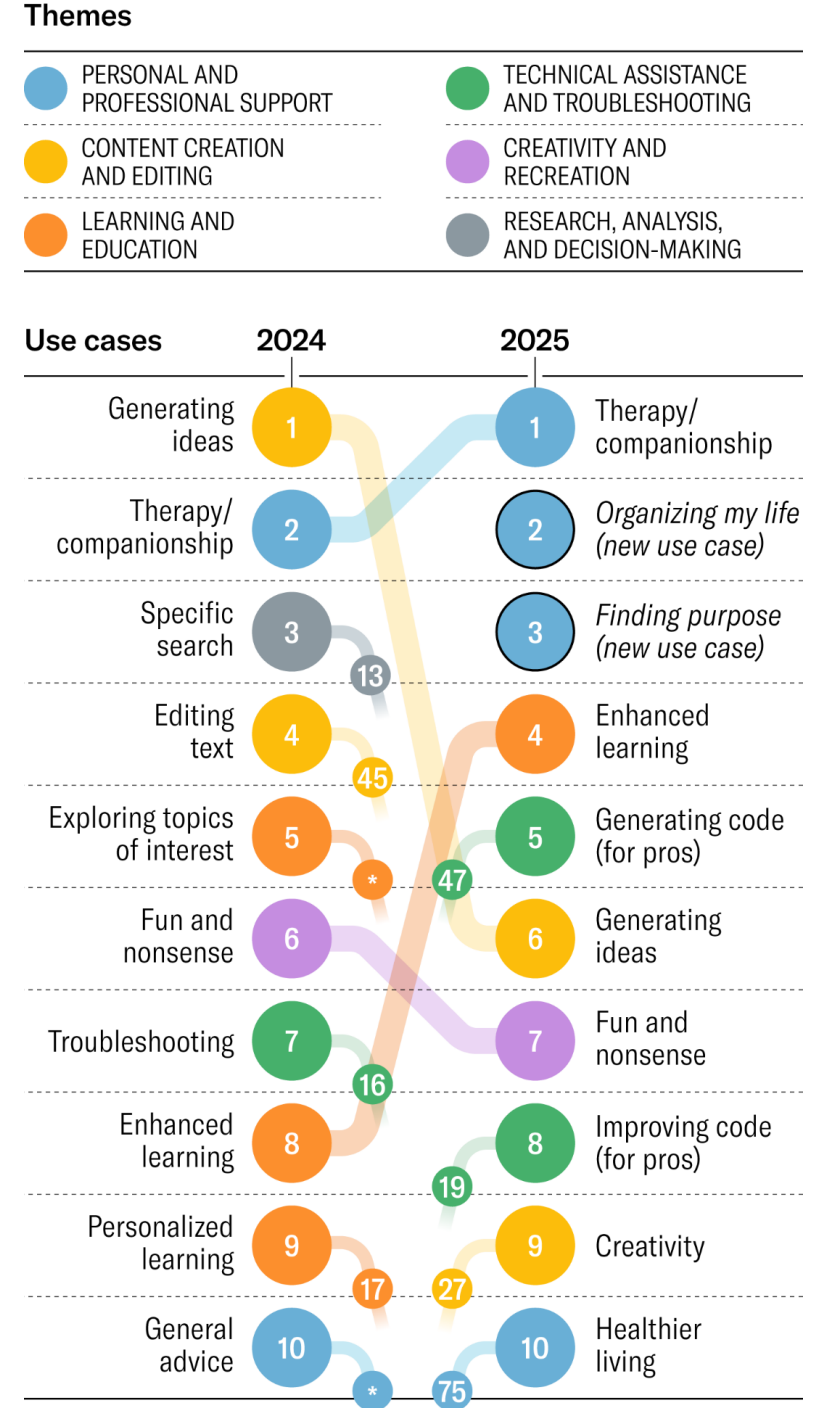
Occupations with the greatest percentage of members on LinkedIn adding AI Aptitude skills to their profiles in 2023

How do we use generative AI?

# How people are really using AI

According to research by Marc Zao-Sanders of Harvard Business Review, this year marks a shift from technical to emotional applications.

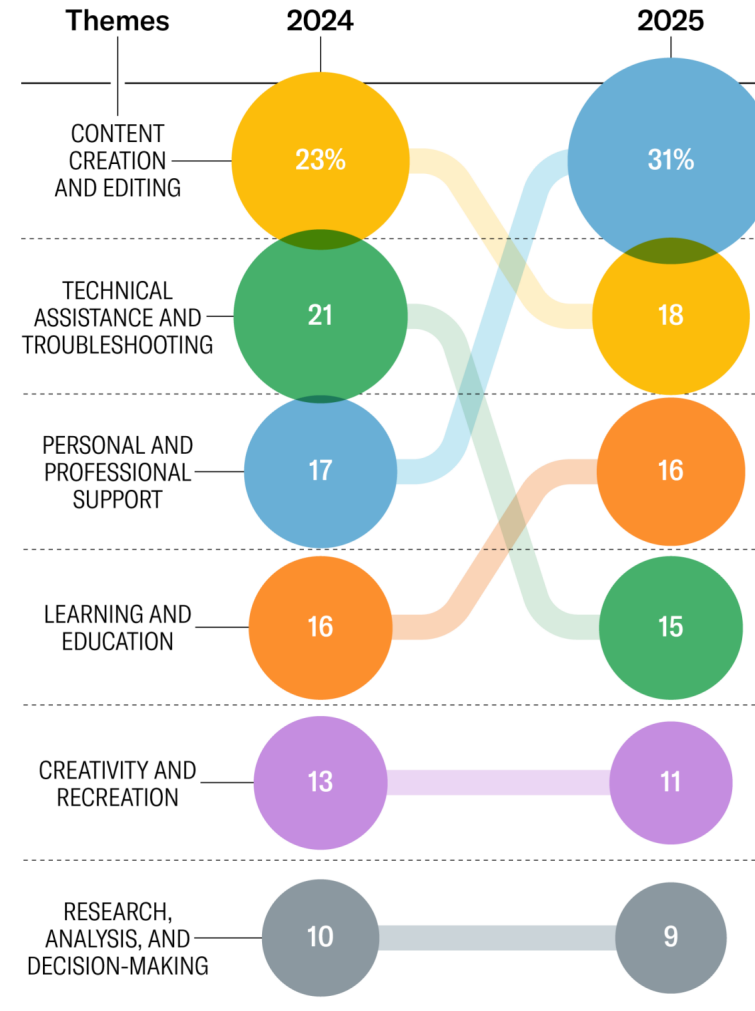
<https://hbr.org/2025/04/how-people-are-really-using-gen-ai-in-2025>



# Themes in Gen AI Use

## Major Gen AI Use Case Themes That Emerged

Use cases have shifted from technical to emotive over the past year.



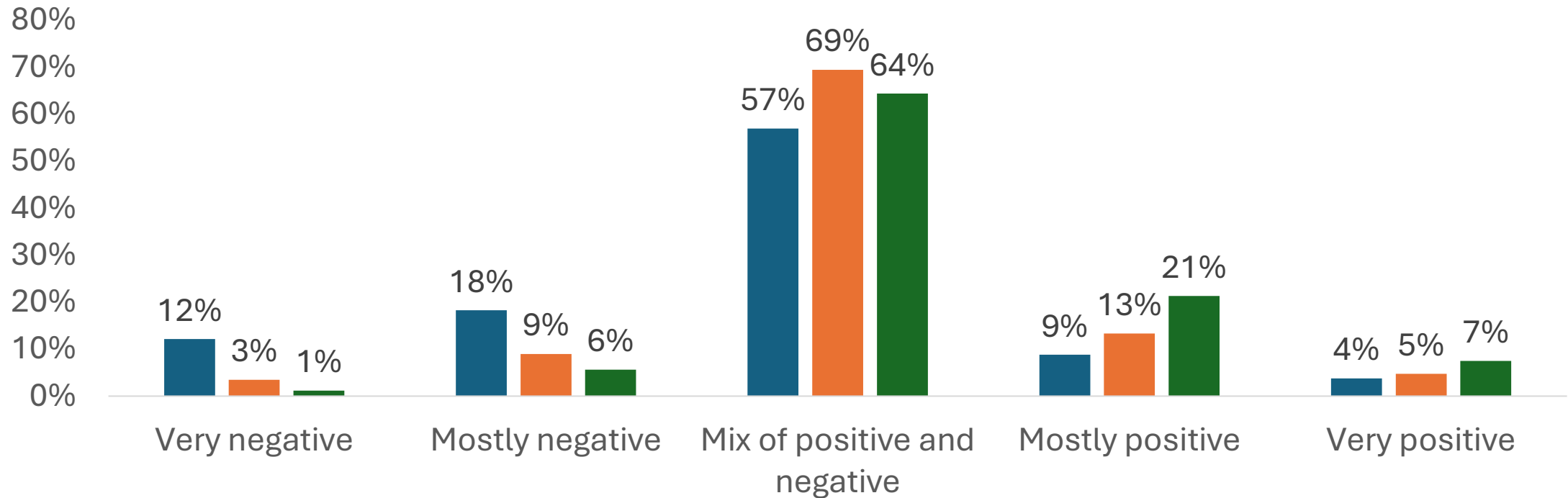
Source: Filtered.com



# Sentiment around Generative AI

## Expected Impact of AI on Education

■ Faculty   ■ Classified Professionals   ■ Managers



Spring 2024 Statewide California community colleges AI Survey (N = 2,707)

# To use AI most effectively, we must create a trusted space

- A coherent, team-based role out of Gen AI will yield the most benefits and provide the greatest protections from harm
- Currently, most Gen AI use is ad hoc and not well coordinated at the institutional level
- Still a great deal of untapped promise for Gen AI in higher education
- Technology and governance are maturing rapidly

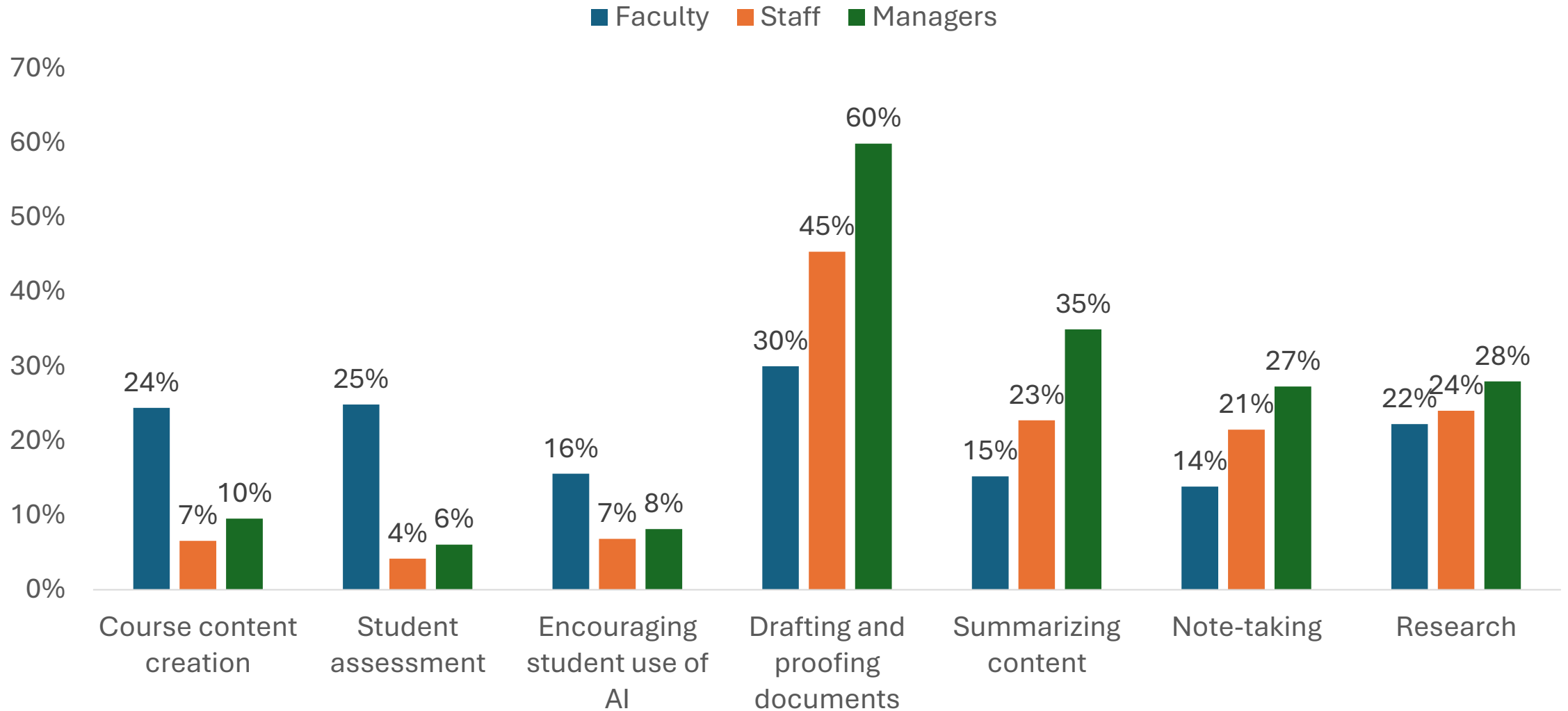
# The Four Pillars of Responsible AI

- Fairness
- Efficacy
- Transparency
- Accountability

# H.U.M.A.N.S. Principles

- **Human-Centered Approach** – Right to opt out, where appropriate, and have access to a person who can quickly consider and remedy problems they encounter. Keep humans in the loop.
- **Universal Support** - Equitable access to tools, training and solutions that minimize bias and improve outcomes.
- **Managed Privacy Controls** – Empower students, faculty, staff and administrators to have agency over how data about them is collected and used and set parameters that shield them from abusive data practices via built-in protections.
- **Algorithmic Discrimination Protections** - Systems should be designed and used in an equitable way that protects users from bias by algorithms. When bias is found/reported, steps should be taken to avoid repeat incidents.
- **Notice and Explanation** – Students, faculty, staff and administrators should know that an automated system is being used and understand how and why it contributes to outcomes that impact them.
- **Safety and Security** – Students, faculty, staff and administrators should be protected from unsafe or ineffective systems.

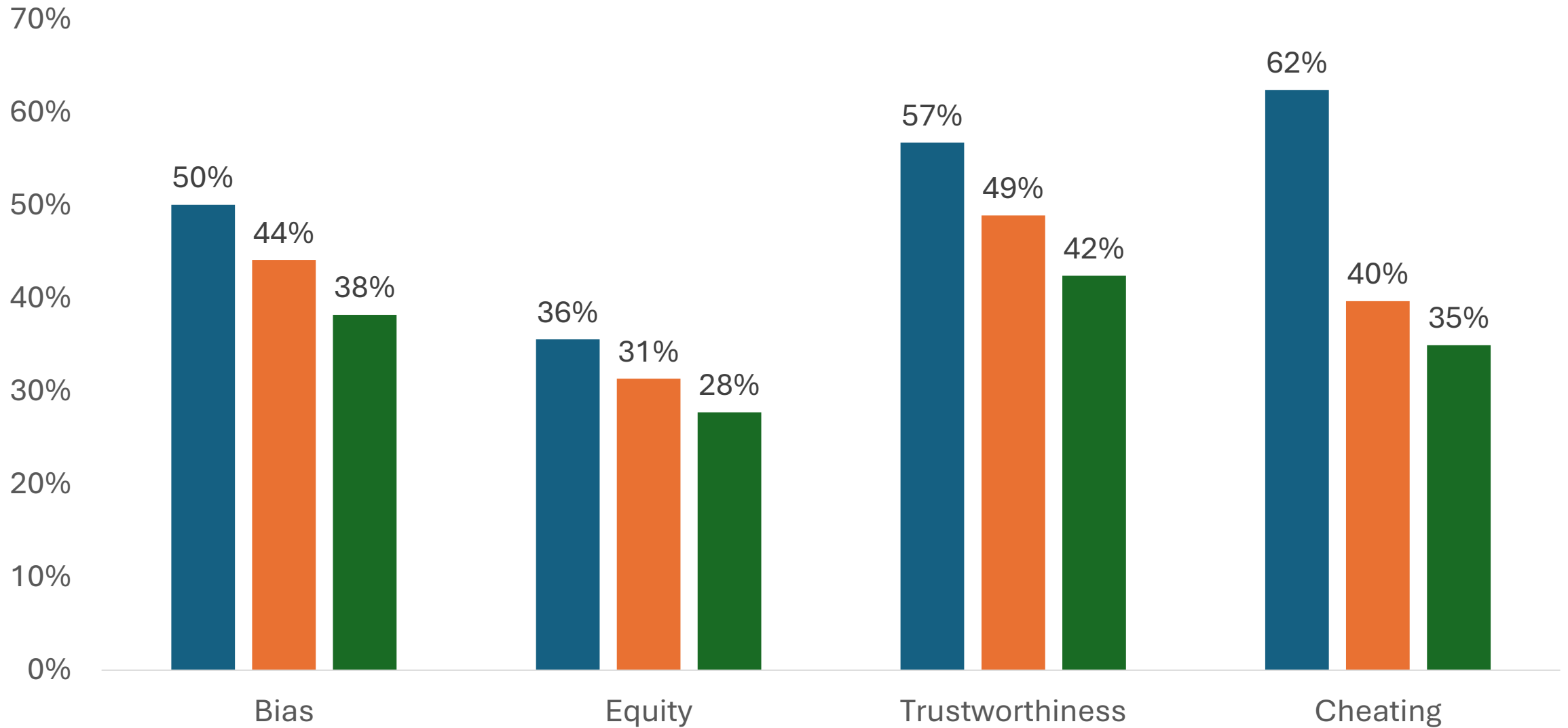
# How are we using AI?



Spring 2024 Statewide California community colleges AI Survey (N = 2,707)

## Percentage of "Extremely Concerned" by Role

■ Faculty ■ Staff ■ Managers



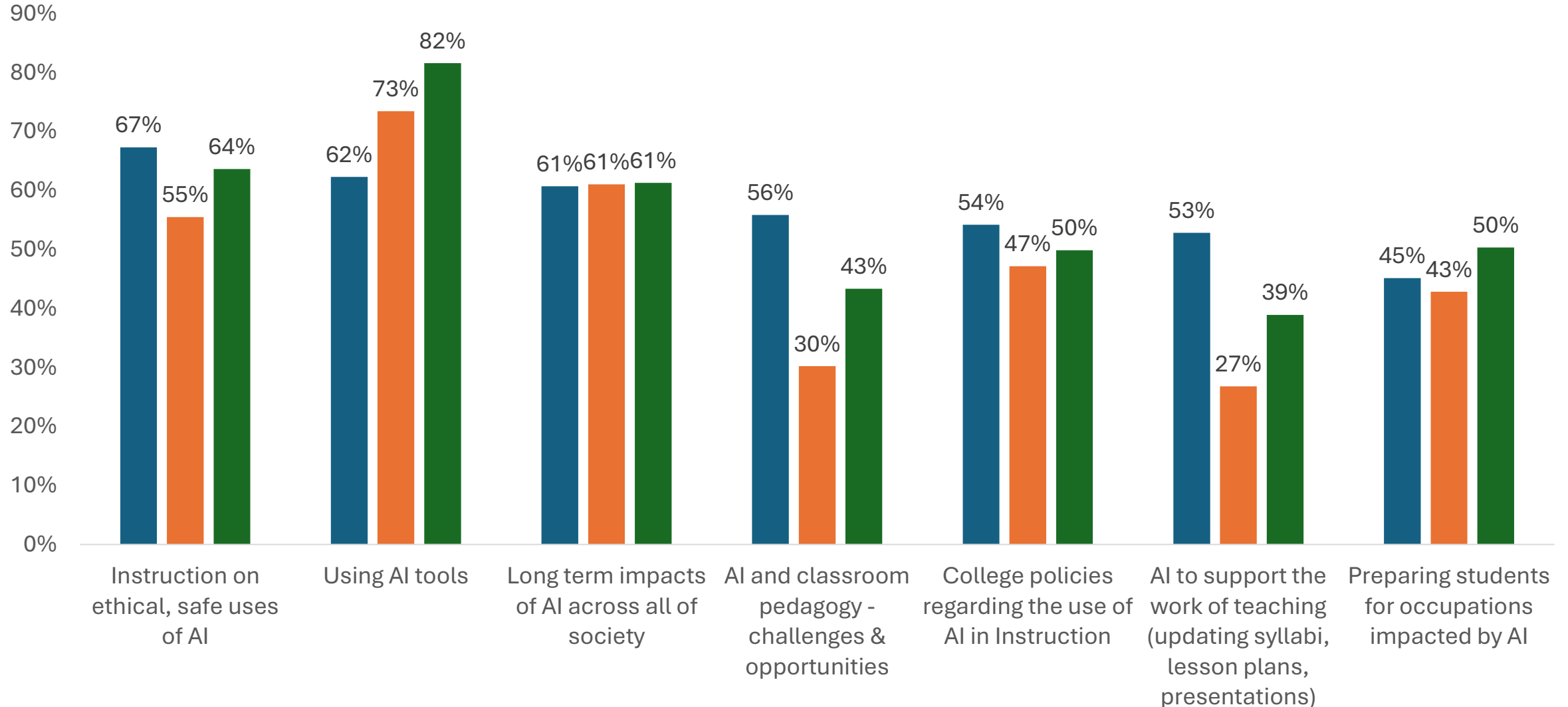
# Top Five Areas of Faculty AI Interest Nationally

- Developing policies and best practices for responsible AI implementation.
- Addressing resistance and supporting faculty in integrating AI into teaching and learning.
- Innovative approaches to embedding AI concepts across various fields.
- Understanding the AI-related competencies employers seek.
- Identifying and accessing high-quality, affordable AI learning resources.

Based on National Applied AI Consortium Community of Practice (CoP) survey

# Areas of Professional Development Interest

■ Faculty ■ Staff ■ Managers



Spring 2024 Statewide AI Survey (N = 2,707)

# Six Fundamentals of AI Literacy

1. Have a foundational understanding of how AI technologies, including GenAI, function.
2. Prompt GenAI and other AI-powered tools to produce accurate and useful responses.
3. Be able to explain relevant frameworks for the ethical use of AI, both generally and specifically at the campus.
4. Evaluate the relevance, bias and accuracy of AI generated outputs, correcting these issues when they are found by fine-tuning prompts and editing outputs to ensure that they are reliable and free of bias.
5. Recognize that although GenAI tools can mimic human behavior, they are not self-aware or capable of human thought and their output is fundamentally different from human communication.
6. Understand how the benefits of using AI as well as strategies for mitigating the potential harms of AI can change over time and remain committed to continuous learning and updating of skills.

# Ways we can use Gen AI in higher education

- Once we have created a trusted, data protected environment for deploying Gen AI tools, there are many ways it can help us bridge the gap between the level of achievement, support, and operational efficiency we aspire to and what we are currently able to achieve, including:
  - Support multiplier for student support services
    - Counselor to student ratios typically challenging
  - Embedded, customized AI tutors
    - Include time to ramp up, ample professional development, and options to opt-out
  - To speed up degree award and transcript evaluation
    - Support speedy and efficient transfer processes!

# AI-Supported Academic Advising: Exploring ChatGPT's Current State and Future Potential toward Student Empowerment

Akiba & Fabroni, 2023

<https://www.mdpi.com/2227-7102/13/9/885>

Artificial intelligence (AI), once a phenomenon primarily in the world of science fiction, has evolved rapidly in recent years, steadily infiltrating into our daily lives. ChatGPT, a freely accessible AI-powered large language model designed to generate human-like text responses to users, has been utilized in several areas, such as the healthcare industry, to facilitate interactive dissemination of information and decision-making. Academic advising has been essential in promoting success among university students, particularly those from disadvantaged backgrounds. Unfortunately, however, student advising has been marred with problems, with the availability and accessibility of adequate advising being among the hurdles. The current study explores how AI-powered tools like ChatGPT might serve to make academic advising more accessible, efficient, or effective. The authors compiled a list of questions frequently asked by current and prospective students in a teacher education bachelor's degree program in the United States. Then, the questions were typed into the free version of ChatGPT, and the answers generated were explored and evaluated for their content and delivery. ChatGPT generated surprisingly high-quality answers, written in an authoritative yet supportive tone, and it was particularly adept at addressing general and open-ended career-related questions, such as career outlook, in a clear, comprehensive, and supportive manner using plain language. We argue that AI-powered tools, such as ChatGPT, may complement but not necessarily replace human academic advisers and that these tools may very well serve to promote educational equity by empowering individuals from a wide range of backgrounds with the means to initiate effective methods of seeking academic advice.

# Establish an evaluation framework

- Before implementing a new GenAI technology, first clarify how you will measure its impact on key performance indicators in addition to internal metrics such as number of students served and student satisfaction or rating of the service itself.
- If deploying GenAI to assist with advising and support tasks, what important activities and metrics would it impact?
  - More educational plans completed?
  - Higher student satisfaction with student support?
  - Greater utilization of support services and financial aid?
  - Higher retention and persistence?

# AI Tutoring & Class Assistants

# Evaluating the Effectiveness of LLMs in Introductory Computer Science Education: A Semester-Long Field Study

Authors:  [Wenhan Lyu](#),  [Yimeng Wang](#),  [Tingting \(Rachel\) Chung](#),  [Yifan Sun](#),  [Yixuan Zhang](#) | [Authors Info & Claims](#)

[L@S '24: Proceedings of the Eleventh ACM Conference on Learning @ Scale](#) • Pages 63 - 74 • <https://doi.org/10.1145/3657604.3662036>

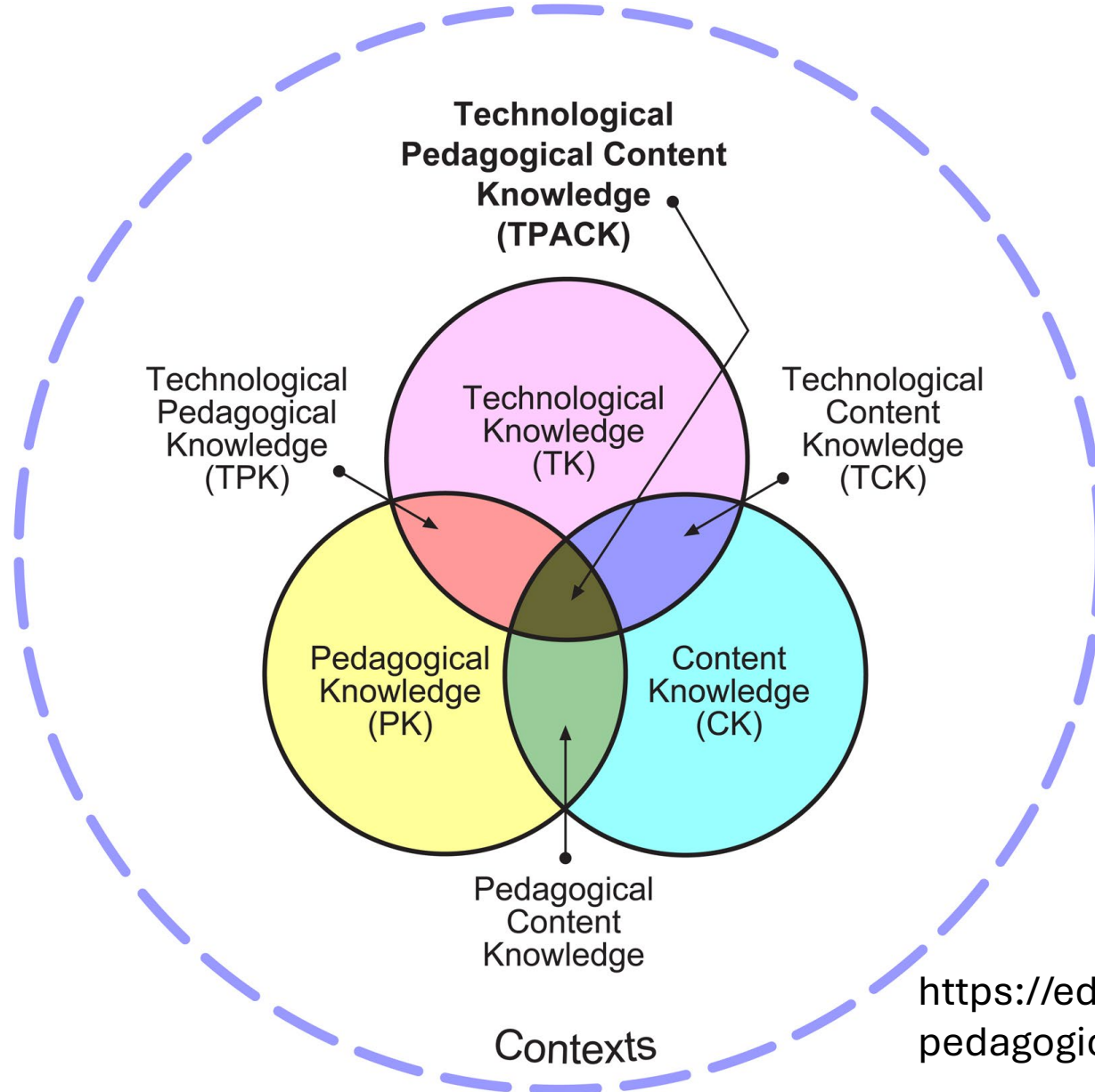
<https://dl.acm.org/doi/10.1145/3657604.3662036>

An emerging body of work has looked into using LLMs in education, primarily focusing on evaluating the performance of existing models or conducting short-term human subject studies. However, very little work has examined the impacts of LLM-powered assistants on students in entry-level programming courses, particularly in real-world contexts and over extended periods. To address this research gap, we conducted a semester-long, between-subjects study with 50 students using CodeTutor, an LLM-powered assistant developed by our research team. Our study results show that **students who used CodeTutor achieved statistically significant improvements in their final scores** compared to peers who did not use the tool (the "control group"). Within the CodeTutor group, those without prior experience with LLM-powered tools demonstrated significantly greater performance gain than their counterparts. We also found that students expressed positive feedback regarding CodeTutor's capability to comprehend their queries and assist in learning programming language syntax. However, **they had concerns about CodeTutor's limited role in developing critical thinking skills**. Over the course of the semester, students' agreement with CodeTutor's suggestions decreased, with a growing preference for support from traditional human teaching assistants. Our findings also show that students turned to CodeTutor for different tasks, including programming task completion, syntax comprehension, and debugging, particularly seeking help for programming assignments. Our analysis further reveals that the quality of user prompts was significantly correlated with CodeTutor's response effectiveness. Building upon these results, we discuss the implications of our findings **for the need to integrate Generative AI literacy into curricula** to foster critical thinking skills and turn to examining the temporal dynamics of user engagement with LLM-powered tools. We further discuss the discrepancy between the anticipated functions of tools and students' actual capabilities, which sheds light on the need for tailored strategies to improve educational outcomes.

# Ongoing AI Class Assistant Evaluation

- 280 instructors in pilot
- Currently collecting data for the first 40 classes held in fall 2024
- Have held multiple instructor sense-making sessions to better understand how AI is being used
- One instructor included an assignment for students to analyze their experience with the AI class assistant.
  - Enhanced understanding was mentioned spontaneously by 45%
  - Encouraged critical thinking was mentioned by 39%
  - Supported learning was mentioned by 36%.
- Based on the results, will work to find mechanism to make available to more/all colleges and classes.
  - Previous pilots found that the average grade increased by one grade point (e.g., C → B)

# The need for professional development



<https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/>

# Operational Efficiencies

# Operational efficiencies

- HR increasingly leveraging AI
  - Recruitment – helping to identify talent
  - Workflows – improving engagement and saving time by automating repetitive workflows
  - Well-Being – help employees identify, set, and track mental and physical health goals
  - Training – In-house training opportunities for promotion
- Need for an ongoing risk and reward evaluation

# Operational efficiencies: Transcript Evaluation

**WILHELM:** What about examples of the use of AI in the registrar's office?

**DYER:** Transcript processing. We recently implemented a tool that uses AI, so it's taking what used to be a very mundane task and speeding it up.

A way I would like to see AI used in our registrar's office is just for exceptions, like data cleanliness. There's so much coding that happens in that department that then affects the entire university. I envision somehow utilizing AI to tell us where those problems are, where those roadblocks are happening, where the data is not what we're expecting it to be. But we're not there yet.

# AI Policy – We need these to create a trusted space for the AI work

- Academic integrity
- Data security and privacy
- [Ethical and responsible use](#)
- Pedagogy
- Syllabus
- General use
- [WCET AI Policy Center](#) contains examples for all these areas

<https://bit.ly/WCET-AI-Policy>

# A couple of additional free resources...

- Elements of AI – An introductory but fairly detailed tour of the underlying principles of Gen AI provided by the University of Helsinki. Good for a general audience.
  - [https://bit.ly/Helsinki\\_AI](https://bit.ly/Helsinki_AI)
- AI for Everyone – A free Coursera course with Andrew Ng which covers AI basics, terminology, societal implications, and applications of AI.
  - [https://bit.ly/AI\\_Everyone](https://bit.ly/AI_Everyone)

# Thank you!

Craig Hayward, Ph.D.

<https://www.linkedin.com/in/craighayward/>

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