

A Quality Matters Event

QM Research  
Online  
Conference



# Active/Applied Research on Online Learning and

February 27, 2025 | Online

# Beyond Automation

Using AI to Create Engaging, Aligned,  
and Inclusive Online Courses

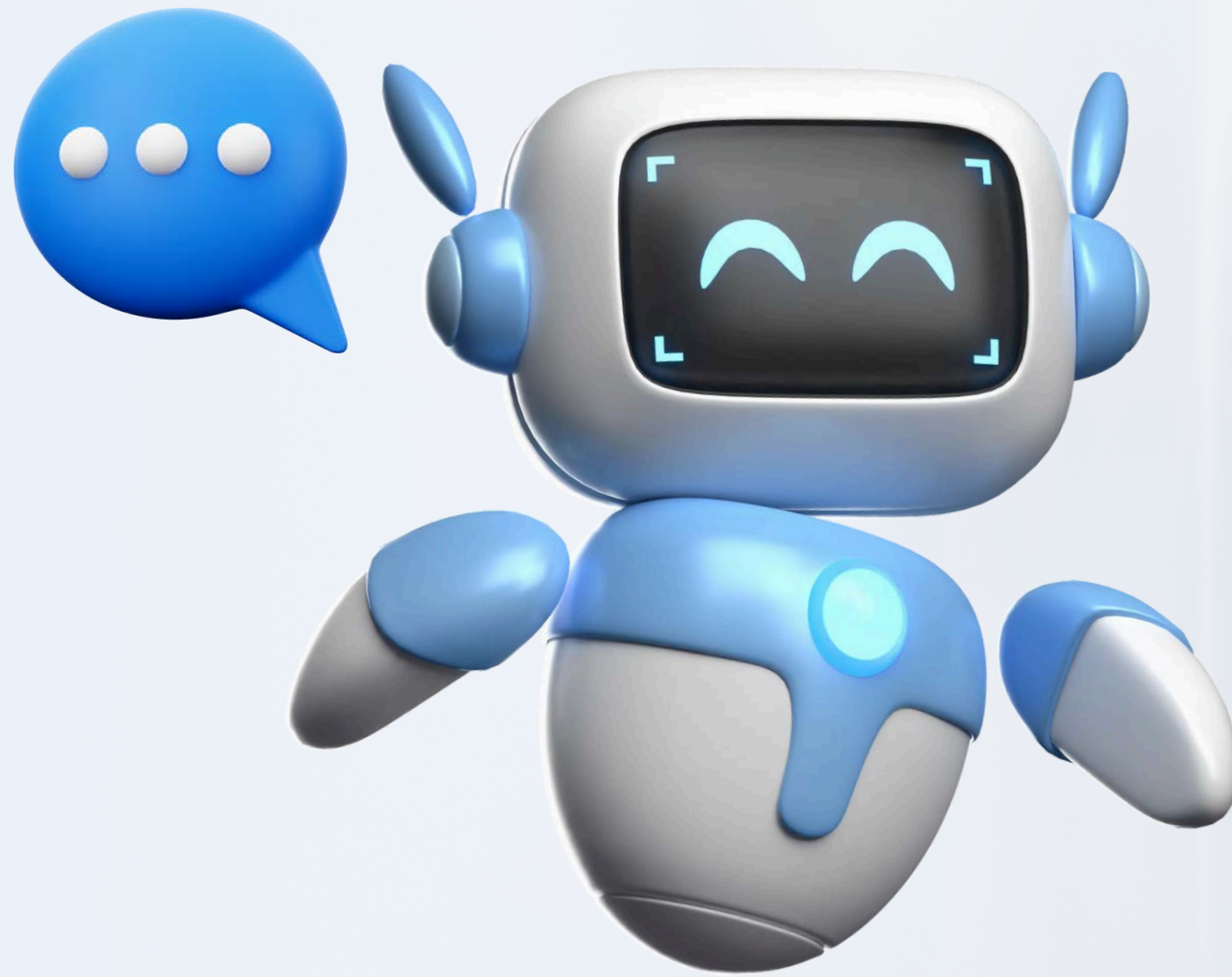
## Siobahn Day Grady, PhD

Director | Institute for Artificial Intelligence & Equity Research  
North Carolina Central University

## Racheal Brooks, PhD

Director | Quality Assurance Implementation Solutions  
Quality Matters

# What excites you most about AI in the next 5 years?



# A Guide for Our Conversation

- **Leveraging AI for Engagement**
- **Ensuring Pedagogical Alignment with AI**
- **Promoting Inclusivity and Accessibility with AI**
- **Ethical Considerations and Practical Strategies**
- **Advancing AI Innovation and Equity**

# Leveraging AI for Engagement



# Enhancing Student Interaction through AI

- Utilize AI-driven chatbots to answer student questions and improve response times
- Virtual teaching assistants can facilitate real-time discussions

## ChatGPT (OpenAI)

- Provides conversational support for FAQs, assignment clarification, and tutoring
- Increases student engagement through immediate, personalized interactions

## Wooclap

- Audience response system for interactive lectures
- Offers live quizzes, word clouds, and open-ended responses



Cao, C. C., Ding, Z., Lin, J., & Hopfgartner, F. (2023). AI chatbots as multi-role pedagogical agents: Transforming engagement in CS education. *arXiv preprint arXiv:2308.03992*.



# Personalized Learning Experiences

- Adaptive learning systems can tailor content based on individual student data
- Supports increased student motivation, improved retention, and enhanced self-paced learning

## Socratic by Google

- Offers AI-powered explanations for a wide range of subjects and disciplines
- Supports students through tailored, real-time help

## Knewton Alta

- An adaptive learning platform that adjusts content based on student performance
- Supports personalized learning paths in order to boost student success



Khosravi, H., Kitto, K., & Williams, J. J. (2019). Ripple: A crowdsourced adaptive platform for recommendation of learning activities. *Journal of Learning Analytics*, 6(3), pp. 91-105, [10.18608/jla.2019.63.12](https://doi.org/10.18608/jla.2019.63.12)

# Strategies to Implement AI for Engagement



- Integrate AI chatbot tools to foster dialogue and provide instant feedback
- Incorporate AI-driven discussion prompts to generate thought-provoking questions for online forums

## Mentimeter

- Provides AI-enhanced polling and quiz features
- Promotes live engagement during synchronous sessions

## Duolingo (AI-driven version)

- Uses AI to adapt language learning based on user progress
- Demonstrates how gamification with AI can improve motivation



Lo, C. K., Hew, K. F., & Jong, M. S. Y. (2024). The influence of ChatGPT on student engagement: A systematic review and future research agenda. *Computers & Education*, 105100.



# H5P

## Best Practices for AI-Driven Engagement

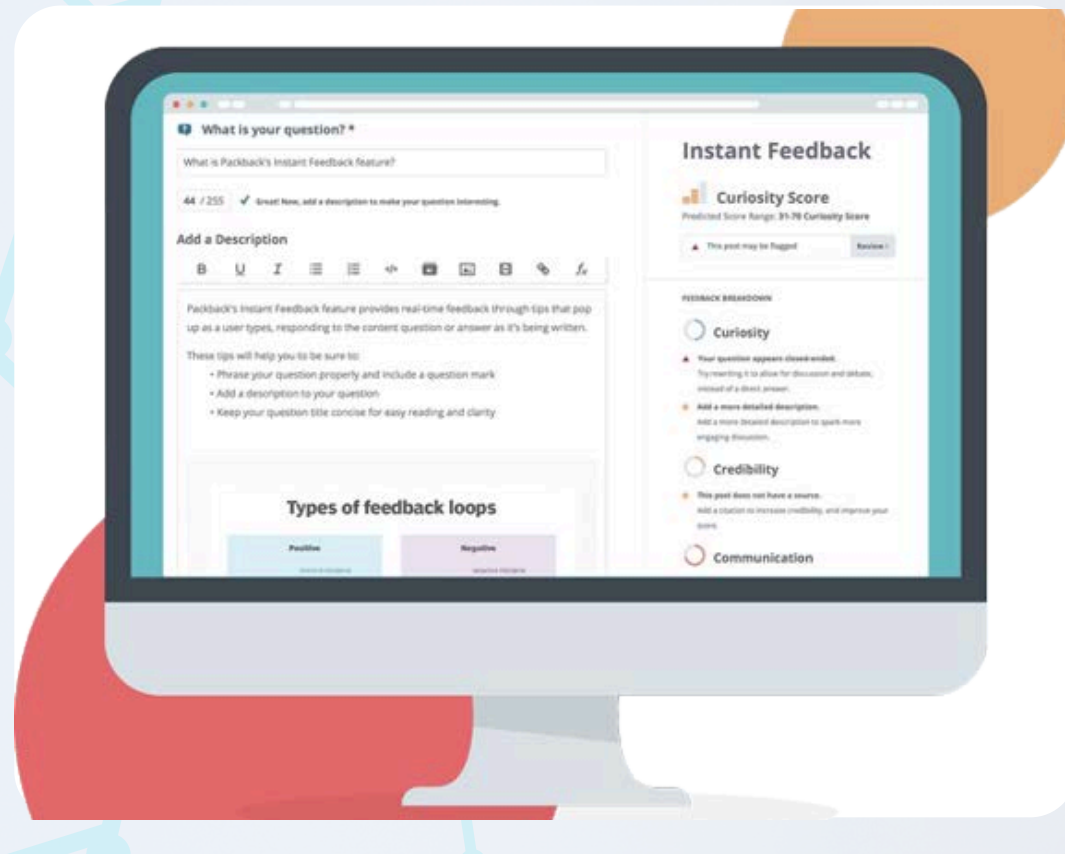
- Use AI to develop interactive content such as simulations or branching scenarios
- Employ video tools with AI analytics to track engagement and refine learning materials to meet students' needs
- Adopt AI that provides immediate, personalized student feedback

### H5P Interactive Content Tool

- Enables AI-supported interactive video creation
- Increases student interaction with course content

### Packback

- An AI-driven discussion board platform that encourages thoughtful engagement
- Promotes higher-level thinking and student participation



Holcombe, A., & Wozniak, S. (2024, July 1). *Using AI to fuel engagement and active learning*. ascd. <https://ascd.org/el/articles/using-ai-to-fuel-engagement-and-active-learning>

# Ensuring Pedagogical Alignment with AI

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# AI in Curriculum Development

- AI can be used to map learning objectives to assessments, materials, and learning activities
- AI can support course developers in identifying gaps and redundancies in curriculum planning

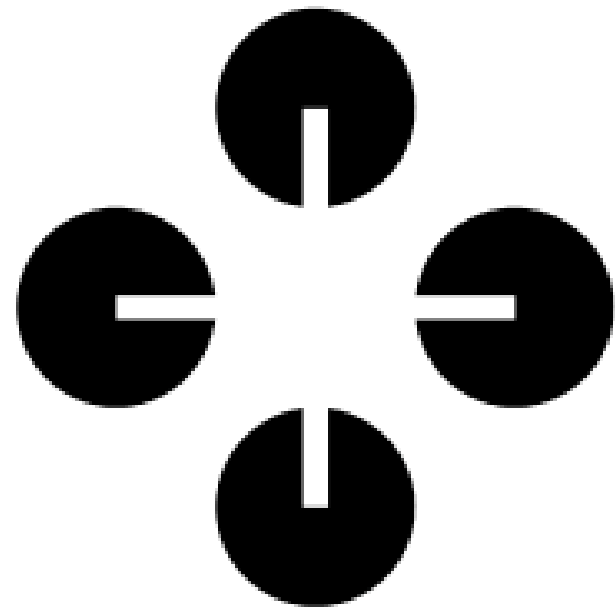
## Coursetune

- Provides AI-assisted curriculum mapping and visualization
- Helps align course content with learning outcomes and accreditation standards

## Sana Labs

- Personalizes learning paths at an institutional level
- Enhances course coherence and curriculum alignment

Fang, B., & Broussard, K. (2024, August 7). *Augmented course design: Using AI to boost efficiency and expand capacity*. EDUCAUSE Review. <https://er.educause.edu/articles/2024/8/augmented-course-design-using-ai-to-boost-efficiency-and-expand-capacity>



# Maintaining Academic Rigor with AI



- AI tools can support robust content development while simultaneously promoting quality
- It is critical to balance AI assistance with faculty expertise

## Grammarly (AI Writing Assistant)

- Provides real-time feedback on grammar, tone, and clarity
- Assists faculty and students in producing high-quality written content

## TestWe

- AI-driven proctoring and secure exam environments
- Promotes academic integrity during assessment administration



Stefaniak, J. E., & Moore, S. L. (2024). The Use of Generative AI to Support Inclusivity and Design Deliberation for Online Instruction. *Online Learning*, 28(3), 181-206.

# Strategies for Pedagogical Alignment Using AI

- Employ AI tools to map course content to learning objectives
- Use AI to develop and refine assessments that accurately measure learning objectives
- Utilize AI for content mapping via platforms that align content with accreditation standards

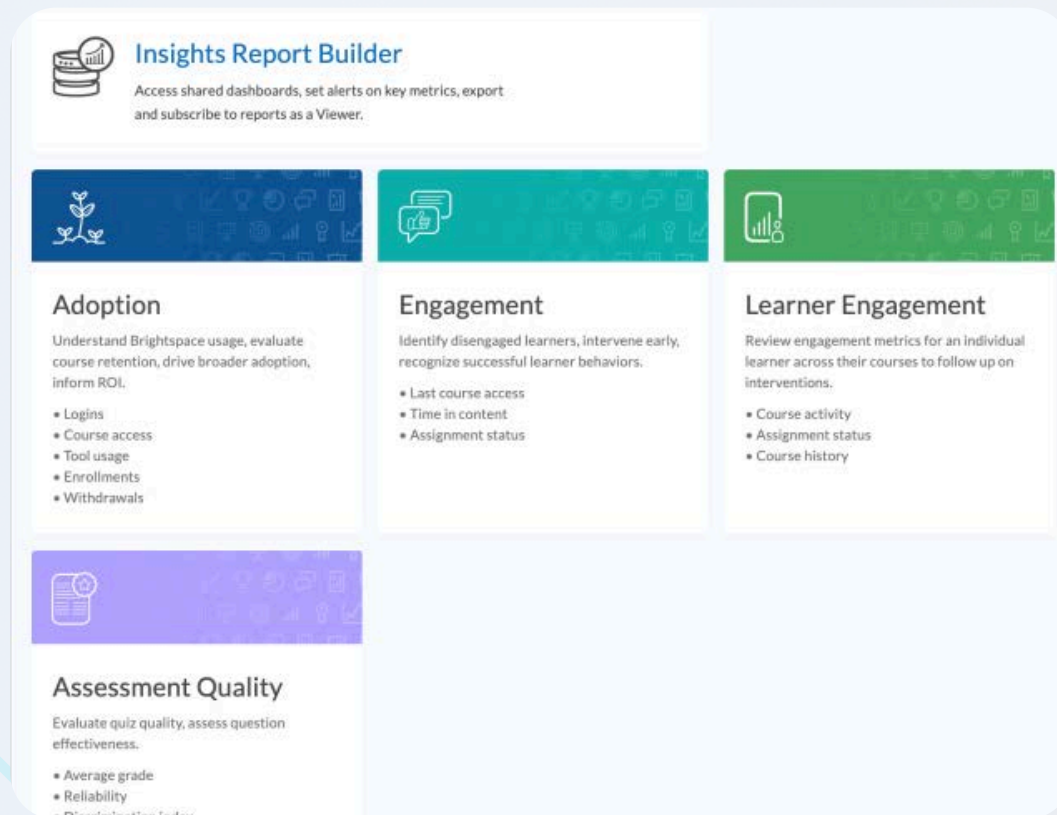
## Brightspace Insights by D2L

- Uses AI analytics to map student progress to learning objectives
- Helps instructors adjust teaching strategies based on data

## Inspira Assessment

- AI-based platform that creates varied and robust assessments
- Ensures alignment of assessments with course goals

Liu, L., Mendoza, R. A., Martin, T. R., & Miori, V. M. (2024, June). Generative AI-Powered Educational Alignment: A Framework for Matching Syllabus Course Topics with Web Description. In Proceedings of the 2024 9th International Conference on Distance Education and Learning (pp. 340-346).





**Otter.ai**

# Best Practices for AI Integration in Course Design

- Ensure human oversight to maintain academic integrity and prevent over-reliance
- Assess AI-generated materials for accuracy and goal alignment
- Use AI to streamline content creation while preserving instructor-student interaction

## Otter.ai

- Transcribes meetings and lectures with AI-driven accuracy
- Facilitates accessibility and aids in content validation

## Perusall

- Allows for collaborative document annotation
- Encourages deep reading and aligned discussions

**Perusall**<sup>®</sup>

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education-where are the educators?. *International Journal of Educational Technology in Higher Education*, 16(1), 1-27.

# Promoting Inclusivity and Accessibility with AI

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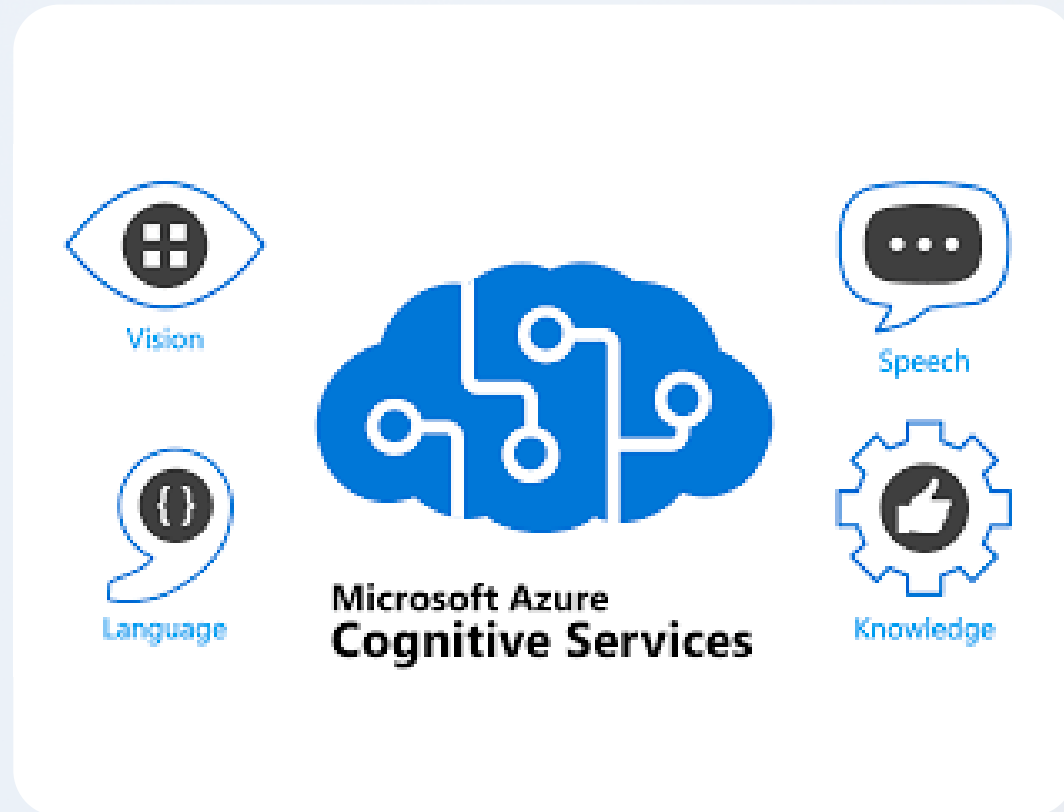
# AI Enhancing Accessibility

- AI can support improved accessibility through the use of automatic captioning, translation, and alternative text generators
- Ability to provide real-time accessibility improvements to course content
- Fosters student motivation by supporting expanded opportunities for self-directed learning through barrier removal

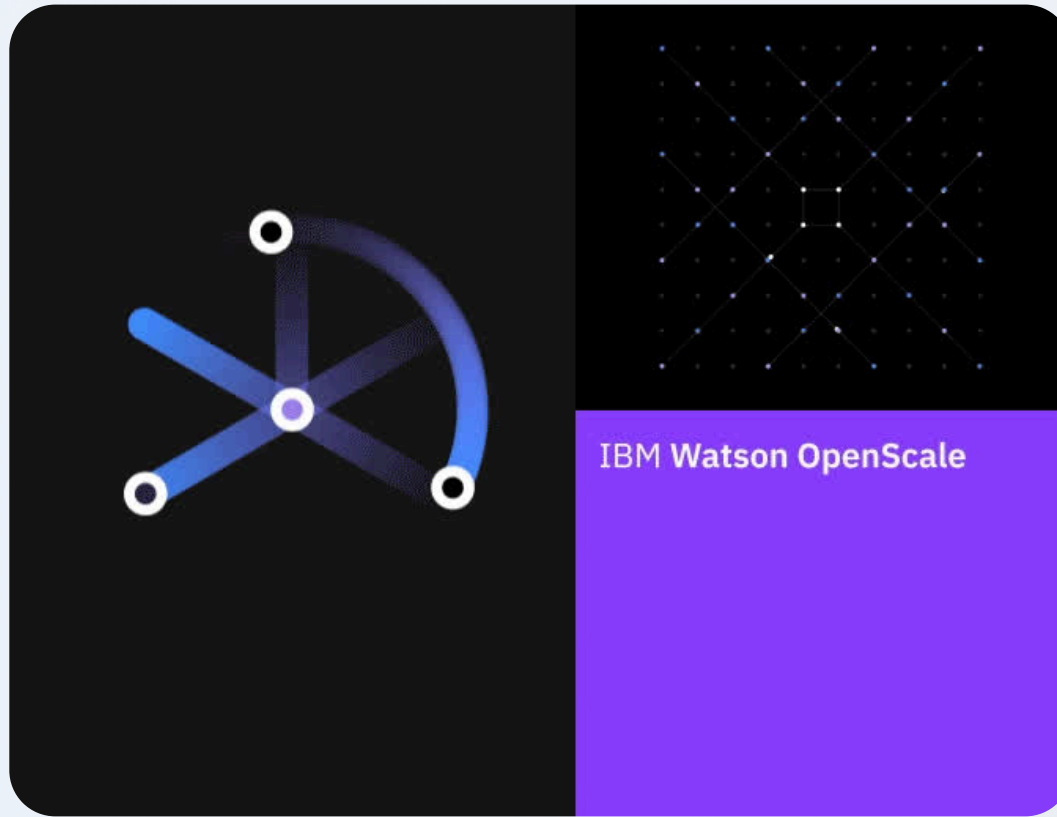
## Microsoft Azure Cognitive Services   EquatIO

- Offers speech-to-text, translation, and accessibility tools
- Enhances content accessibility for diverse learners
- Reads and creates accessible math equations
- Makes STEM content more accessible for students with disabilities

Marino, M. T., Vasquez, E., Dieker, L., Basham, J., & Blackorby, J. (2023). The future of artificial intelligence in special education technology. *Journal of Special Education Technology*, 38(3), 404-416.







# Fostering Inclusive Learning Environments with AI

- Critical to identify and address algorithmic bias in AI-generated content
- Utilize AI to represent diverse perspectives and avoid cultural insensitivity
- AI can support instructors in incorporating Universal Design for Learning (UDL) principles by providing multiple means of representation, expression, and engagement



## IBM Watson OpenScale

- Monitors AI models in production for bias and fairness
- Real-time bias detection and reporting

## Diversity.AI

- Identifies biases in text and media
- Ensures course content reflects diverse perspectives

Saborío-Taylor, S., & Rojas-Ramírez, F. (2024). Universal Design for Learning and artificial intelligence in the digital era: Fostering inclusion and autonomous learning. *International Journal of Professional Development, Learners and Learning*, 6(2).

# Strategies to Improve Accessibility Using AI



- Use translation software to support diverse student populations such as multilingual learners
- Incorporate voice-activated AI assistants to enhance accessibility for students with physical disabilities
- Employ AI tools to automatically adapt open educational resources to more accessible formats

## Sonocent Audio Notetaker

- Supports audio processing and accessible note-taking
- Assists learners with auditory processing needs

## Kurzweil 3000

- Text-to-speech software for to support reading comprehension
- Aids learners with dyslexia and visual impairments



Ingavélez-Guerra, P., Robles-Bykbaev, V. E., Perez-Muñoz, A., Hilera-González, J., & Oton-Tortosa, S. (2022). Automatic adaptation of open educational resources: an approach from a multilevel methodology based on students' preferences, educational special needs, artificial intelligence and accessibility metadata. *IEEE Access*, 10, 9703-9716.



## AI Fairness 360

# Best Practices for Inclusive AI Integration

- Regularly evaluate AI systems for potential bias in educational content
- Use training data that reflects diverse populations when using AI tools

### AI Fairness 360 by IBM

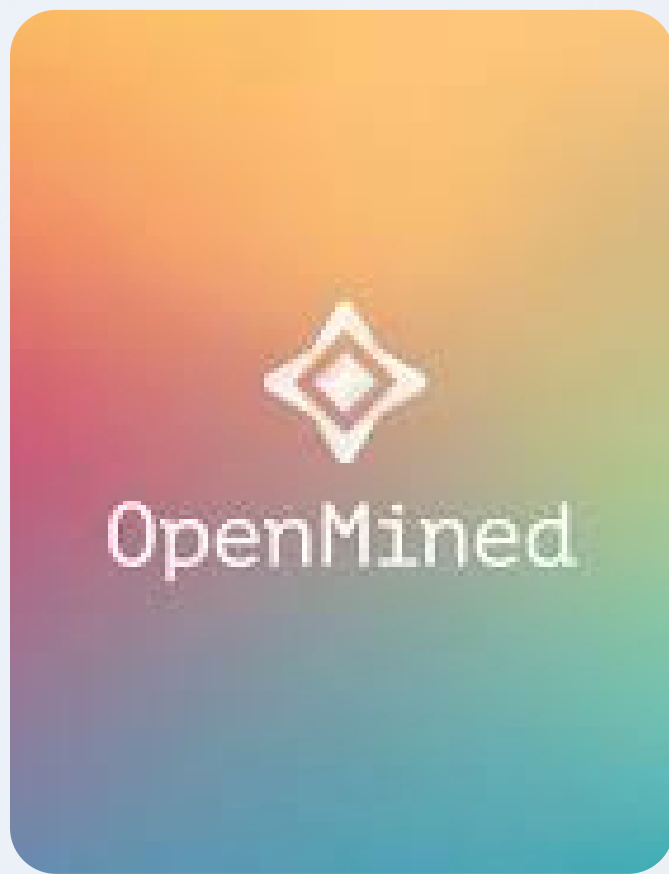
- Open-source toolkit for detecting and mitigating AI bias
- Ensures fairness in AI applications for course design

### Textio

- Provides writing assistance to reduce unconscious bias
- Detects biased language and suggests inclusive alternatives

Mayfield, E., Madaio, M., Prabhumoye, S., Gerritsen, D., McLaughlin, B., Dixon-Román, E., & Black, A. W. (2019, August). Equity beyond bias in language technologies for education. In *Proceedings of the fourteenth workshop on innovative use of NLP for building educational applications* (pp. 444-460).

# Ethical Considerations and Practical Strategies



# Ethical Considerations in AI Use

- Institutions must ensure personal and academic data are collected, stored, and used responsibly in compliance with privacy laws (e.g., FERPA)
- AI systems can inherit biases from training data, leading to unequal treatment or exclusion of certain student groups
- Seek clarity on how AI decisions are made to combat AI system decision-making ambiguity
- AI should not replace critical thinking and original work

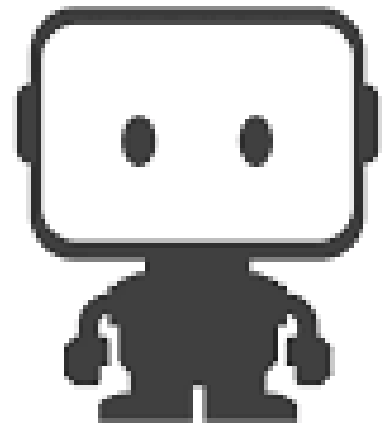
## Fairlearn by Microsoft

- Open-source toolkit that helps assess and improve fairness in AI
- Includes fairness metrics dashboard and bias mitigation algorithms

## OpenMined

- Community-driven platform for privacy-preserving AI applications
- Promotes ethical data handling in education

Floridi, L., & Cowls, J. (2022). A unified framework of five principles for AI in society. *Machine learning and the city: Applications in architecture and urban design*, 535-545.



**DataRobot**



# Practical Guidelines for AI Integration

- Create clear institutional and course guidelines on ethical use and data privacy with AI
- Engage students in AI transparency by explaining how AI is used in course delivery to build trust
- Ensure AI tools support, not replace, human judgement in educational decisions
- Select AI tools that are accessible to all learners, including those with disabilities

## DataRobot

- Provides transparent AI model explanations
- Enhances understanding of how AI decisions are made

## ConsentKit

- Manages consent for data collection
- Ensures compliance with privacy laws and ethical data use

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nature machine intelligence*, 1(9), 389-399.

# Advancing AI Innovation and Equity

# The Current State of Diversity in AI



## Women are underrepresented

Women make up 6% of AI researchers and developers at top tech companies.



## Racial minorities are underrepresented

Black people make up less than 2% of employee technical roles at Google and Facebook.



## Lack of diversity leads to bias

Homogeneous teams can lead to biased algorithms that disadvantage women and minorities

Findings from the CSET [July 2023 Data Brief](#) and [Time](#)

The current lack of diversity in AI workforces risks perpetuating historical biases and exclusions through algorithmic systems.



# The Current State of Diversity in AI



## Elite Universities Represented

62% percent of AI Researchers were concentrated in 10 elite universities and top companies.



## Citations

By comparison with the most-published and highest-h-indexed researchers, the most-cited researchers were disproportionately more likely to work in companies rather than at universities.

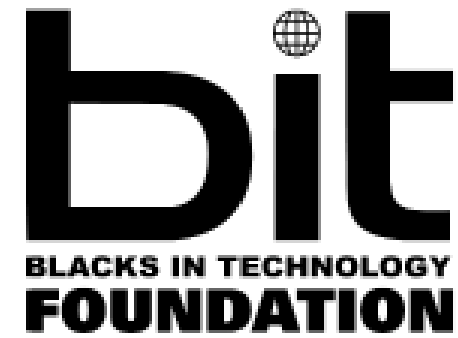
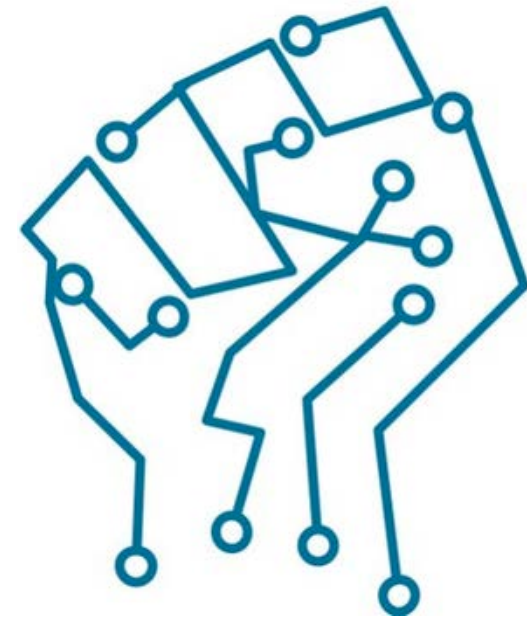


## Positions of Top Researchers

Held positions at universities while publishing their work during the past decade, though some had spent time at major tech companies such as Google and Microsoft.

Findings from the CSET [July 2023 Data Brief](#)

The current lack of diversity in AI workforces risks perpetuating historical biases and exclusions through algorithmic systems.



**DIVERSITY.AI**  
Inclusion | Balance | Neutrality

**POCIT**  
PEOPLE OF COLOR IN TECH

**tech exchange**



# Organizations promoting Diversity in AI

Blacks in AI

Diversity.AI

Blacks in Technology.

People of Color in Tech

Google Tech Exchange

Women in Machine Learning + Data Science

Khipu AI

Findings from [Obviously AI](#)

# Steps to Increase Diversity

## Set Measurable Diversity Goals

Define specific, measurable goals for improving diversity such as increasing underrepresented groups by a certain percentage over a timeline.

## Update Hiring and Recruiting Practices

Implement unbiased and inclusive recruiting tactics like removing names/gender from applications, diverse interview panels, skills-based assessments.

## Foster an Inclusive Company Culture

Promote inclusion through diversity training, employee resource groups, mentoring programs, and policies that support work-life balance.

# AI Needs Diversity to Succeed

## Lack of Representation

AI systems built without diverse perspectives suffer from bias and fail to serve underrepresented groups.

## Broader Understandings

Teams with diverse backgrounds bring different lived experiences that allow for more thoughtful and well-rounded AI.

## Mitigating Bias

Diversity helps identify blind spots that lead to biased outcomes, allowing teams to proactively address them.

## Better Decisions

Research shows that diversity improves decision making, critical thinking and innovation.

## Inclusive Products

Diverse teams build products that work well for diverse users, improving user experience.



# Siobahn Day Grady, Ph.D.

My vision for an inclusive future in technology is realized by promoting educational opportunities across multiple platforms – from community organizations to academic research and philanthropic endeavors. I am committed to the future of STEM, and have established six merit-based, STEM-centric endowed scholarships at all of the HBCUs within the University of North Carolina System, effectively easing the financial strain on deserving students.

I actively assist through promoting a more diverse and inclusive future through:

Role Model IF/THEN Alumna

Mentorship

Research (LAIER)

Scholarships

Outreach/Broadening Participation in Computing



Established in 2020, the Laboratory for Artificial Intelligence and Equity Research (LAIER) is developing a community of researchers. Our team comprises enthusiastic contributors highly motivated to work with new ideas. The LAIER will encompass work on a diverse set of topics within artificial intelligence related to the following:

- Machine learning
- Human-computer interaction
- Diversity and inclusion

The interdisciplinary research approach of LAIER provides a rich and diverse learning experience to graduate researchers. We engage in collaborative analysis, journal publications, audience participation, and workshops.

#### Critical Areas of Development:

- Representation/Exposure
- Mentorship/Mentoring
- Research
- Professional Development



**NCCentral**  
UNIVERSITY

Institute for Artificial Intelligence  
and Equity Research (IAIER)

# NCCU's AI Institute - A Game Changer

## The Institute for Artificial Intelligence and Equity Research (IAIER)

- Founded with a \$1M Google.org Grant
- The first AI Institute at an HBCU

### Mission:

Advancing AI with a focus  
on equity, and innovation

### Key Focus Areas:

- Ethical AI & Policy
- AI for Social Good
- AI in Workforce Development



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# Research & Innovation at IAIER

Interdisciplinary Research	NCCU's Unique Approach
<ul style="list-style-type: none"><li>○ AI &amp; Social Equity</li><li>○ AI &amp; Cybersecurity</li><li>○ AI in Biomanufacturing &amp; Health Sciences</li><li>○ Assistive AI for People with Disabilities</li></ul>	<ul style="list-style-type: none"><li>○ Collaboration across law, business, and STEM fields</li><li>○ Community-driven AI solutions</li></ul>





# AI & Workforce Development - Preparing the Next Generation

Building AI Talent Pipelines	Creating AI Career Pathways
<ul style="list-style-type: none"><li>○ Engaging 200+ students in AI Research &amp; Training</li><li>○ Hands-on learning data science, AI ethics, and engineering</li><li>○ Internships, mentorships, and corporate partnerships</li></ul>	<ul style="list-style-type: none"><li>○ Collaborations with industry leaders (Google, Cisco, OpenAI, FICO, Anthropic)</li><li>○ AI upskilling programs for students and professionals</li></ul>



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Working with Industry & Government

Tech Partnerships:

- Google, FICO, Cisco, OpenAI, Anthropic, Museum of Life and Science, and more



# Partnerships & Collaborations

## Federal & State Funding for AI Research & Workforce Programs

### Academic & Community Collaboration

- NCCU's Technology Law & Policy Center
- NCCU's Cybersecurity & Data Science Programs
- Local Businesses & community AI workshops



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# The Future of AI at NCCU

## Expanding AI Research & Training

- More funding & research initiatives
- Growing student & faculty involvement

## Strengthening AI Workforce Development

- Creating AI certification programs
- Offering AI workshops & online courses
- Positioning NCCU as a National Leader in AI Equity



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## Call to Action - How You Can Get Involved

<b>Students:</b>	<b>Industry Professionals:</b>	<b>Community &amp; Policy Leaders:</b>
Join AI courses, Research labs, and mentorship programs	Partner with NCCU on AI Innovation & Workforce Development	Advocate for equitable AI policies and funding

# Thank you!

## Q&A | Closing Remarks

Stay Connected: Follow NCCU & IAIER for updates!

### NCCU IAIER



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<https://www.nccu.edu/research/institutes-and-special-facilities/iaier>

### QM Consulting



consulting@qualitymatters.org



<https://www.qualitymatters.org/qa-resources/consulting>

