AI in Academics: A Paradigm Shift In Pedagogy

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The Overview

The future of education

Strategies to mitigate the use of AI

Strategies on how you can use AI

The Future of Education → Enhanced by AI Personalized Learning

Flexible Pacing

Individualized Instruction

Student-Centered Learning

Data-Driven Instruction

The Future of Education → Enhanced by AI Adaptive Learning

- Assessments
- Content
- Delivery
- Progress monitoring

The Future of Education → Enhanced by AI Intelligent Tutoring Systems

Cognitive Tutor: A study conducted by Carnegie Mellon University found that high school students who used the Cognitive Tutor ITS for algebra performed significantly better on standardized tests than students who received traditional classroom instruction.

ALEKS: A study conducted by the University of California, Irvine found that college students who used the ALEKS ITS for math instruction achieved significantly higher grades than students who received traditional classroom instruction.

DeepTutor: A study conducted by the University of Memphis found that students who used the DeepTutor ITS for science instruction achieved significantly higher learning gains than students who received traditional classroom instruction.

iSTART: A study conducted by the University of Pittsburgh found that students who used the iSTART ITS for reading comprehension achieved significantly higher learning gains than students who received traditional classroom instruction.

AI and the future of work - what it may look like...

Automation of routine tasks that are consistent and vary little day-to-day and month-to-month.

More demand for Data Scientists, AI Engineers, and Machine Learning Specialist.

More focus on soft skills and care giving fields.

Careers that focus on human-to-human interaction will require more interpersonal skills and interaction.

Careers that require nuanced decision making will be less vulnerable, but still impacted.

AI in Education: Causes for Concern

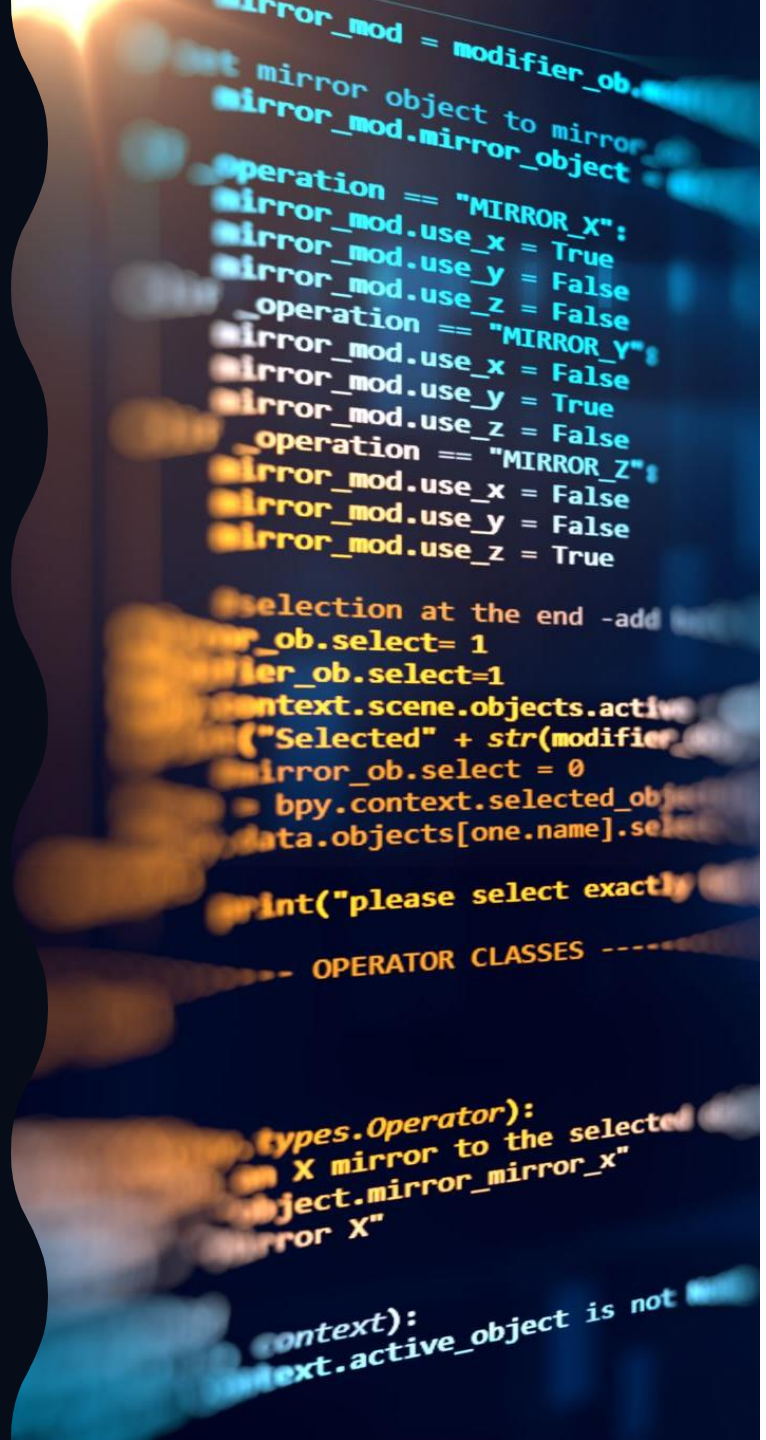
Data Privacy and Security

Bias and Fairness

Integration with Existing Systems

Training and Support

Ethical Considerations



Precarious Pedagogical Precipice: What can we do?

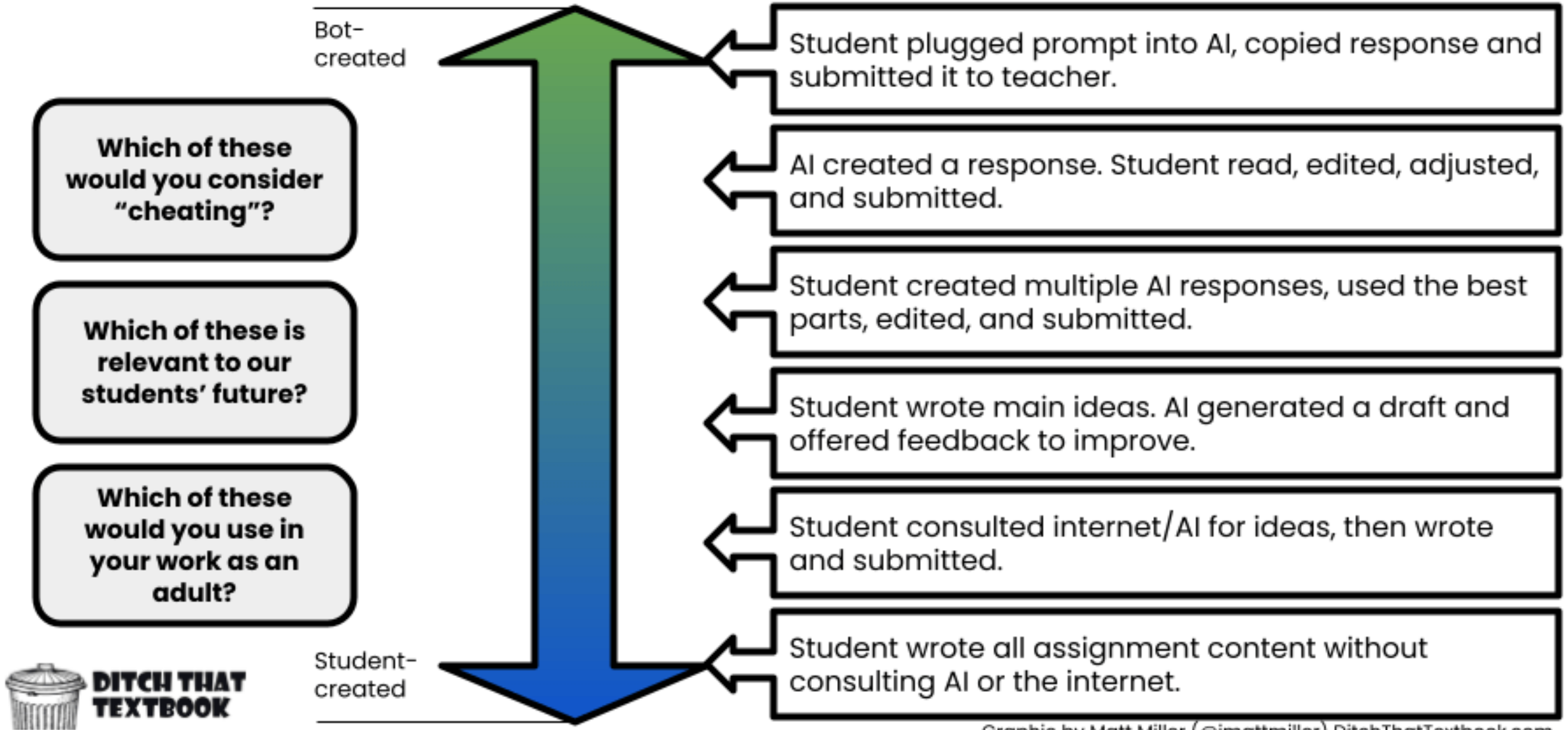
This is not like plagiarism; it is completely different.

- Ineffective Detectors…serious validity and reliability questions.
  - GPTZero
  - Corrector App
  - OpenAI's AI Text Classifier
- The Old Favs still work.
  - Respondus LockDown Browser
  - Respondus Monitor

So…What should we do now?

- Have a frank conversation with students about academic integrity and remind them of University's policies.
  - Specifically, Policy 217, Section 4.
- Ask students pointed questions about integrity and their future.
  - What's the point of pursuing a degree, and taking classes if you don't learn?
  - Taking small shortcuts today, lead to big gaps in the future.
    - Shortcuts = Big Gaps = rough road, so do the work.
- Ask students to reflect and take ownership of their learning.

It's time to rethink "plagiarism" and "cheating"



DITCH THAT TEXTBOOK

Graphic by Matt Miller (@jmattmiller) DitchThatTextbook.com

It is time to rethink our assignments and assessments.

How well do your assignments relate to the learning objectives of the course?

Are the assignments realistic, tied to the real-world and their future career?

Are the assignments varied in nature, drawing on different learning strengths and styles of students?

Are the assignments scaffolded? Are there steps and opportunities for practice and feedback to support and reinforce success?

Strategies to mitigate the use of AI in your assignments.

01

Design, develop, and refine authentic assignments your courses.

- Authentic assignments challenge AI because it working off a confined data set.

02

Look at your students' work in multiple ways.

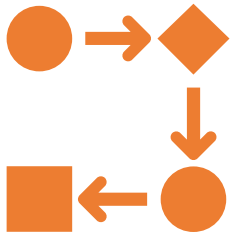
- Utilize different types of assessments (i.e., portfolios, role playing, case studies) makes it difficult for students to use AI to complete assignments.

03

Lower the stakes and lower cheating.

- Large assignments broken down into small chunks provides more feedback opportunities for students, and less reason to cheat.

Strategies to mitigate the use of AI in your assignments.



Have students submit drafts of their work.

Provides opportunities for you to see and analyze changes from one draft to the next. Word allows you to track document changes.

Create assignments that promote higher-order thinking.

AI works well with “General” information, not so much “Nuanced” information.

Strategies to mitigate the use of AI in your assignments.

- Develop assignments that have multiple components.
  - Weak Assignments
    - Single topic research papers
    - Pros and Cons arguments
    - Summarizing passages
    - Single assignment writing prompts

More Robust Assignments: Just-In-Time-Teaching (JiTT) Questions.

They encourage student responses by addressing myths, misconceptions, or biases.

They examine student to examine their prior knowledge and experience.

They are ambiguous and require students to additional information that has not explicitly given in the question.

They require students to formulate responses utilizing underlying concepts in their own words.

JiTT Example

- Are Panda Bears Worth Saving?
  - Why are Pandas not reproducing?
  - Why do they continue to eat bamboo, when their body has not adapted to the high fiber count of the plant?
  - Are they worth the cost? Pandas are rented from China, and cost millions of dollars per year. If a cub is born, there is an additional tax from China.
  - Are Pandas still considered a symbol of diplomacy and goodwill between China and other countries?

More Robust Assignments: Wicked Assignment Design.

Instead of relying on other sources, students are encouraged to take risk and come up with their own solutions.

Breaks the belief that instructors want students to regurgitate or replicate what others have said about the topic.

Students assume authority and ask, “so what?” questions. They must make judgements and decisions on context that may be uncertain or change day-to-day.

Wicked Example

- You are running for president.
  - Explain to your constituents the similarities and differences of Rome and the US.
  - Explain the political, religious, economic and social problems of Rome and how they may or may not relate to the US.
  - Present your information in an intelligent yet personable tone demonstrating conviction and national pride.

More Robust Assignments: Transparency in Learning and Teaching Design (TILT).

Three factors for transparent assignment design: Purpose, Task, and Criteria.

Purpose: Define skills are practiced and what knowledge is gained.

Task: Explain what students are expected to do and how they are to take responsibility for their own learning.

Criteria: Provide a rubric or checklist including examples with annotated feedback.

TILT Example

- In a large introductory STEM and Humanities course (65-300 students).
  - Purpose: Discuss assignments' learning goals and design rationale before students begin each assignment.
  - Task: Gauge students' understanding during class through think-pair-share-analyze-summarize.
  - Criteria: Debrief graded tests and assignments in class.

Be more engaging than AI. Engaging your students in class builds relationships.

- Minute Paper
- Class Content Journals
- Think – Pair – Share – Analyze – Summarize
- Polling Students
- Pause and Reflect
- Intentional Mistakes
- Mind Mapping

Leverage the power of AI in your classroom.

- Feedback Assistant
- Debate Partner
- Additional Point-of-View
- Prompt Generator
- Quiz Creator

Questions for you and your colleagues

- How will I define cheating in my course and my program?
- How are we going to prepare students for AI in our field of study?
- What is something I can do to day to better understand AI and the future of education?
- Who in my department, college, and university can I lean on for curriculum support and guidance?
- How will I approach the use of AI in my courses and my program?

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