1

For Further Conversation

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2

“I like, I wish, What if”
(p. 121, Seelig)

3

How do we process all this information and apply it our own teaching/leading situation? For specific strategies, see:
https://www.amle.org/just-did-some-professional-development-now-what/

4

5

q	p
c	d

Which letter does not belong, and why?

6

"We went to school. We were not taught how to think; we were taught to reproduce what past thinkers thought…

Instead of being taught to look for possibilities, we were taught to exclude them. It's as if we entered school as a question mark and graduated as a period "

-- Michael Michalko, *Creative Thinkering,* 2011

7

"[D]ogmatism – the absolute adherence to a prescribed set of beliefs, regardless of circumstances or additional information – is at odds with creative and critical thinking."

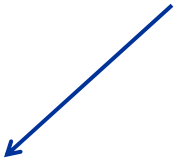
– Starko, p. 6

8

Ideas aren't singular. There are generated and maintained by a network of connections. Exposure to more experiences, perspectives, problem-solving, narratives, and similar improves those connections and yields more ideas.

9

Our future depends on this one here.



10

We are hired for how we are similar to a company, but we advance based on how we are different.

11

Could we teach the differences between architecture in the Middle Ages and architecture in the Renaissance period in such a classroom?

12

How about the principles of algebra here?

13

- In social studies or history, teach it from the modern era backwards to the segment in which you were supposed to start.
- Take a specific theme or topic through the decades you're teaching, then go back and take another them or topic through the same decades and note the connections & influences. Continue with the next topic or theme.

Sample: Innovate with a Normally Chronological Curriculum

14

“[L]earning is fundamentally an act of creation, not consumption of information.”

-- Sharon L. Bowman, Professional Trainer

15

We seek to be Active Creators, not Passive Consumers.

16

Chance favors
the prepared mind.

-- Louis Pasteur

17

Participate in the larger profession.

Professional inquiry via personal action research projects, Professional Learning Communities, subscriptions to professional journals, participation in on-line communities: Twitter (X), Substacks, Blogosphere, Webinars, professional conferences, podcasts, instructional roundtables in the building. We get more ideas/tools, and creative people are inspired by people around them.

18

Share freely.

We are often better served by connecting ideas than we are by protecting them. (P. 22, Johnson) P.61 – "Instead, most important ideas emerged during regular lab meetings, where a dozen or so researchers would gather and informally present and discuss their latest work. If you looked at the map of idea formation…., **the ground zero of innovation was not the microscope. It was the conference table**."

19

"You can't use up
creativity.
The more you use,
the more you have."
-- Maya Angelou

20

Recommended Resources

- "The Intellectual Life of Teachers" –https://www.amle.org/the-intellectual-life-of-teachers/
- *Where Good Ideas Come From: The Natural History of Innovation* by Steven Johnson
- *Turning to One Another: Simple Conversations to Restore Hope to the Future and Leadership* and *The New Science: Discovering Order in a Chaotic World*, both by Margaret J. Wheatley
- A Visual Approach to Algebra by Frances Van Dyke

21

Recommended Resources

- *Creativity: The Psychology of Discovery and Invention and Flow: Living at the Peak of Your Abilities*, both by Mihaly Csikszentmihalyi
- *inGenius: A Crash Course on Creativity* by Tina Seelig
- *Creativity in the Classsroom* by Alane Jordan Starko
- *Metaphors & Analogies: Power Tools for Teaching any Subject* by Rick Wormeli
- *Summarization in any Subject, 2nd Edition*, by Rick Wormeli

22

With unexamined pedagogy and educators who succumb to both anemic creativity and perilous complacency, diverse students wither - and schools fail.

23

With examined pedagogy and resolute, innovative teachers, however, diverse students thrive, and schools flourish.

24

Most classes are set up to meet the needs of the student who gets it first or easiest, not for the ones who learn differently.

We teach <u>all</u> students, not just those who fit easily into current classifications, protocols, and our narrative of humanity.

25

Effective teachers do not teach blind to the students they serve.

26

Nobody cares what you teach.

Seriously, what you teach is irrelevant. Stop championing your effectiveness in terms of what you teach.

27

What we present doesn't matter so much as ***what students carry forward after the experience.***

This is the testimony for learning and for a teacher and school's effectiveness.

28

We're hired to teach the way students best learn, not the way we (or their classmates) best learn.

29

We honor what individual students and their cultures bring to learning's table. Their narratives are legitimate and have a powerful role in students' learning.

30

Push against the natural tendency to see the world only in terms of your own lens.

31

"The world's problems begin with the notion that some lives are more valuable than others."

- Nelson Mandela, Hatang & Venter, 2011, as quoted by Jim Knight, The Definite Guide to Instructional Coaching, 2022, p. 20.

32

Avoid letting low expectations for struggling students becoming your normal. If we work with disenfranchised, struggling, disadvantaged, or under-resourced students, we need to spend some time with enfranchised, thriving, advantaged, and well-resourced students.

It helps.

33

"When you plant lettuce, if it does not grow well, you don't blame the lettuce. You look for reasons it is not doing well. It may need fertilizer, or more water, or less sun. You never blame the lettuce.

- Thich Nhat Hanh,
Vietnamese Buddhist Monk

34

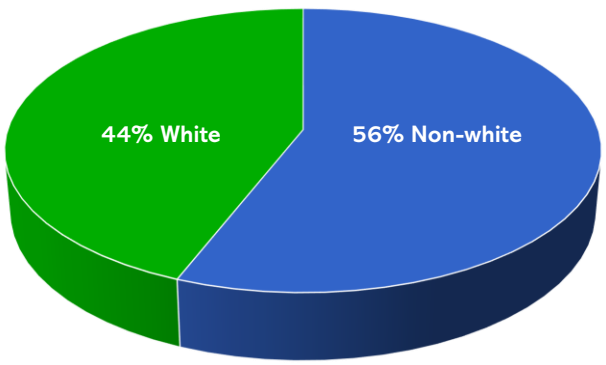
We can be mindful of:

- Diverse levels of background knowledge
- Different levels/types of support needed by students on their way to performance independent of all that support
- Multiple pathways/routes to proficiency, including multiple iterations with feedback
- Students' varying access to resources, tools, finances, child and elderly care
- Language/cultural differences
- Physical and/or mental/academic challenges
- Multiple generations living under one roof

35

As of May 2022, white children were the minority in k-12 classrooms in the United States, and the trend is continuing with white children as the minority group nationwide.

Percent of U.S. Students, k-12



36

22,100,000 (44%) were White,
27,631,000 (56%) were non-white:

- 14.4 million were Hispanic
- 7.4 million were Black
- 2.7 million were Asian
- 2.5 million were of two or more races
- 449,000 million were American Indian/Alaska Native
- 182,000 were Pacific Islander

https://nces.ed.gov/programs/coe/indicator/cge/racial-ethnic-enrollment

37

Learning Differences
Transiency
Interests/Passions
Housing, or lack thereof
Fentanyl/Opioid abuse
Social Media concerns
Immigration Status
LGBTQA+ Community
Race
Religion
Politics
Internet Access
Anxiety/Depression
Poverty
…and more

With all of this, how do we remain equitable?

38

"Equality is giving everyone the same shoe. **Equity** is giving everyone a shoe that fits."

– Source Unknown

And here, we are not neutral or indifferent.

39

Equity requires us to remove barriers and biases that limit students and their learning in any way.

40

Removing barriers to learning is not enough: We also provide tools and support to teachers and students to make sure every student can engage and learn in the opportunities provided.

41

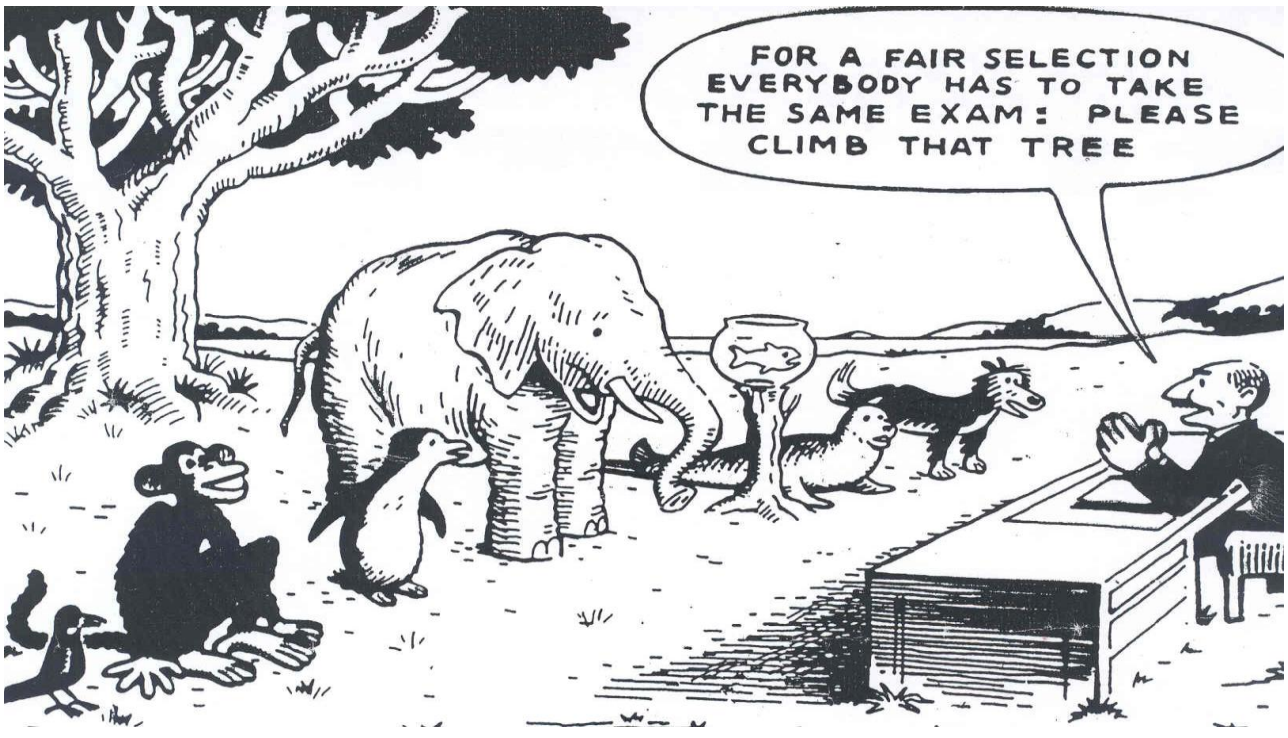
"I can't teach (or grade) like that for those three students because it wouldn't be fair to the others."

42

So, is it fair?

We provide what students need to maximize their learning and achievement, even when it differs from what we do for their classmates. It does *not* mean equal, similar, or same treatment.

43



44

Responsive teaching is not a set of indifferent recipes to follow. It is a set of clear, actionable principles that help teachers respond to students' learning differences to maximize learning (and provide more meaning) over that which otherwise could be achieved.

45

It's what conscientious teachers dedicated to every student's success do in both the larger and smaller moments of their day.

46

Every day we negotiate with ourselves for what level of hypocrisy we will tolerate this day – And some days we are more tolerant than we should be.

So, ask the big questions…

47

- Why is school compulsory?
- Do I conduct myself in such a way that students/colleagues would find feedback from me valuable?
- Is [X] still worth teaching to the next generation?
- Why is this new idea worth imposing on teacher autonomy?
- Whose voice is not heard in our deliberations, and why not?
- How are our current structures limiting effective instruction?

48

- If we do this, what will our students be like in five years?
- Why do we assign homework? Why do we grade students?
- Is this ethical? Does this align with our values?
- Is our over-familiarity with something getting in the way of progress?
- Are we incorporating modern cognitive science?
- Does this thing we do align with our values?

49

To live up to the promise of teaching ALL children, not just the ones who find the classroom a friendly place, with what we know about how the mind learns, and to instruct, assess, and grade ethically, effectively, and equitably, we will have to be ***gently insubordinate***.

50

#1 Most Common Characteristic among the state Teachers of the year:

51

We like orderly schematics and linear progression. It makes us feel like we are productive, and students' learning seems quantifiable.

52

Uneven pacing, varied readiness levels, three steps forward 2 steps back, responding to new variables, shifting priorities, new voices added to the conversation…

Yet, learning is disorderly, and we try to impose order on disorder. How do we build capacity for ambiguity and the dynamic motions of progress?

53

Kids are popcorn, popping (mastering content) at different rates. Popcorn kernels pop at different rates, but when each one pops, it's accorded full status as a piece of popcorn, not something less than popcorn because it popped later than its fellow kernels. We are not beholden to an arbitrary, uniform timeline.

54

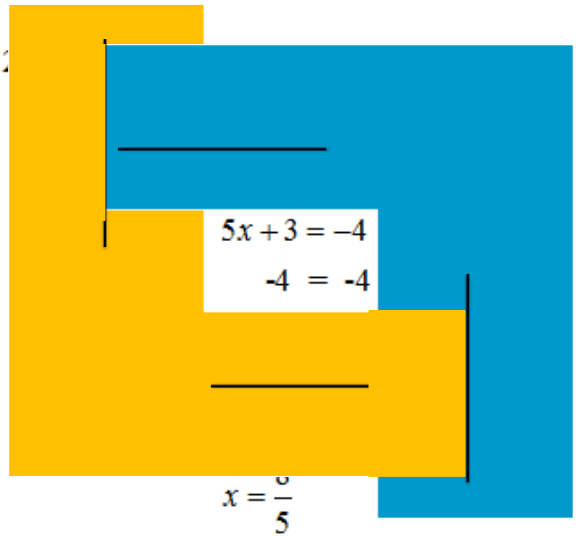
Read complex text aloud with proper vocal inflection and pacing. Students can understand text in readabilities above their own independent, silent reading proficiency when the complex text is read aloud by someone who understands the material and respects the punctuation.

55

Eighty percent of word problems are far more a matter of reading comprehension than they are of math.
Make sure students understand the situation in the word problem, then ask them to employ the math in the service of its solution.

56

What is the value of x when



57

Note:

It is deeply inappropriate to use the characteristics of an extrovert to judge the healthy and positive behaviors of an introvert.

58

Hope is very demanding as it makes things possible and compelling. When there is hope, there is no choice but to forge ahead and commit to the effort.

When we remove hope, there's nothing left to lose, and we find ways to avoid the demands and rationalize our way out of accountability.

59

As needed, then, we scaffold, tier, build capacity for learning, and not limit students to our current notions of what could be.

60

As teachers become more proficient in teaching responsively, they specialize (get up to speed and develop expertise) in the unique natures of the students they teach so as to respond thoughtfully to learning challenges and opportunities.
So, what's important to know about students who…

- Are gifted/advanced?
- Are on the Autism spectrum?
- Suffer from anxiety or depression?
- Are unhoused?
- Has ancestors who were enslaved?
- Have Cerebral Palsy?
- Are English Language Learners?
- Are impoverished?
- Have learning disabilities?
- Have alcoholic parents or siblings?
- Have a high transiency rate?
- Are musicians?
- Are gamers?
- Have to take care of siblings or ailing parents?
- Are artistic?
- Have ADHD or executive function challenges?

61

- The Differentiated Classroom: Responding to the Needs of All Learners, 2nd Edition by Carol Tomlinson
- Leading and Managing a Differentiated Classroom by Carol Ann Tomlinson and Marcia B. Imbeau
- Differentiation: From Planning to Practice by Rick Wormeli
- Fair Isn't Always Equal by Rick Wormeli
- Advancing Differentation by Richard Cash
- Differentiation for Gifted Learners: Going Beyond the Basics, second edition by Diane Heacox and Richard M. Cash
- When Kids Can't Read-What Teachers Can Do: A Guide for Teachers 4-12 by Kylene Beers
- Differentiation in Middle and High School by Kristina Doubet and Jessica Hockett

62

- Differentiated Instructional Strategies: One Size Doesn't Fit All by Gayle H. Gregory and Carolyn M. Chapman
- How to Differentiate Instruction in Academically Diverse Classrooms, 3rd Ed., by Carol Ann Tomlinson
- Culturally Responsive Teaching and the Brain by Zaretta Hammond
- Making Differentiation a Habit by Diane Heacox
- Neurodevelopmental Differentiation: Optimizing Brain Systems to Maximize Learning by Andrew Fuller and Lucy Fuller
- Differentiation in Middle and High School by Kristina Doubet and Jessica Hockett
- Seen, Heard, and Valued by LeeAnn Jung

63

64

In order for someone to accept feedback or take a risk with a new idea, they must admit first that what they were doing was less effective than their ego thought it was.

65

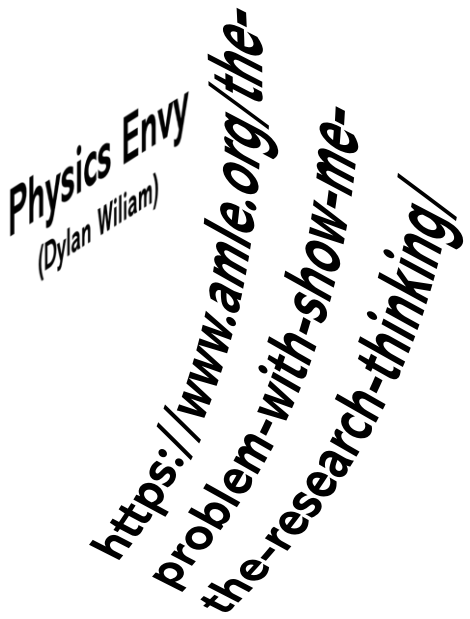
'An Effective "Compass Rose"

66

Wanna know something really scary?

- Most classroom practices we use today, including those that seem effective, do not have robust, peer-reviewed, proper research protocol studies to back them up.
- The majority of cognitive studies that educators cite for why they do what they do in the classroom cannot be replicated by modern researchers.
- The best we can claim is that current is worth considering and that a specific strategy or practice seems to work under these particular conditions.

67



68

"It's not what you don't know that gets you into trouble, it's what you know for sure that ain't so."

- Mark Twain

69

When it comes to teaching and learning, I used to think…, but now I think…"

When it comes to leadership, I used to think…, but now I think…"

70

Education is a social science, and, "Science advances one funeral at a time."

– Theoretical Physicist Max Planck

71

What in teaching, learning, or leadership will you ***unlearn*** at this conference or in the new school year?

72

One from Me, Earlier in my Career:

'Thinking that lack of language proficiency meant lack of thought, knowledge, or know-how.

73

Partial List of Things I've Let Go as an Educator Over the Years

- **"I'm just a teacher."**
- **Oral dictation spelling tests**
- **Needing to grade everything**
- **0's on the 100-point scale**
- **Re-do's for only partial credit**
- **Teaching only to the extent of my own knowledge, not letting students surpass me**
- **Working harder than my students when it comes to their discipline**
- **Being teacher-centered in the classroom**
- **We have to wait until everyone agrees before we move forward**

74

Partial List of Things I've Let Go as an Educator Over the Years

- **Using technology just to use technology, especially when something w/out tech works better**
- **Feeling like a complete failure when I make one mistake during the day**
- **Taking students' comments about me personally**
- **Letting my schoolwork overwhelm my family and personal life**
- **Thinking that only I, the teacher, can give useful feedback.**
- **Of course, others see the logic of my reasoning and find it just as compelling as I do.**

75

Our goal is for students to transcend us, NOT merely get equal to us. Otherwise, civilization grinds to a halt. Let's not limit students to our imperfect imaginations.

76

“We can’t be creative unless we’re willing to be confused.”

- Margaret Wheatley

77

It’s not
an answer chase.

78

It's a question journey.

79

Acknowledge & respond to imposter syndrome.

- Collaboration makes us vulnerable to one another. Some of us are afraid to share our thinking for fear of judgement.
- Some teachers & leaders are afraid they don't have the skills & experience to accomplish stated goals.
- Some of us are barely ahead of our students when teaching something for the first time. We are not completely familiar with our subjects.
- Saying, "I don't know how to do this" feels like admitting incompetence.
- Some teachers & leaders are alternatively certified and may not feel as professionally prepared as others.

80

Do the stuff that scares you.

81

As a new school leader or teacher of any sort, you are allowed to make 6 whopping big mistakes per day. If you make less than that, you're under budget and it was a great day! If you make more than that, wallow in worry for no more than one hour, then return to your regular self. Reset the budget each new day! If you are a veteran, you get 3 mistakes per day.

82

Sample Insights Gained by Letting Go

83

You don't have to have all the answers, nor do you need specific experience with the path(s) ahead. Chances are good that we'll be in unfamiliar territory for years to come.

You.

84

"People don't resist change. They resist being changed!"
- Toll, p. 22, quoting Peter Senge

85

In schools, whoever is doing the editing is doing most of the learning. Do not edit student work. Instead, teach them how to find and correct their own mistakes. They will internalize the correction much more solidly; it's active, not passive.

Suggestion: Place a dot or cartoonish eyeballs near the problem in the student's work without identifying specifically the issue or its correction.

86

Position students as agents of their own learning.

- Based on an idea by Susan Brookhart

87

For example, when providing descriptive feedback that builds perseverance and cultivates engagement & perseverance, **comment on decisions made** and their impact, *NOT* quality of work.

88

Daily exercise has dramatic impact on the development of the brain's frontal lobe (Bennett and Kalish, p. 91). This affects decision-making, abstract and moral reasoning, personality, impulsivity control, immediate working memory, insight, and being aware of consequences

89

Avoid adamantly scripted programs. It is not only ineffective, it's arrogant to assume a publisher can respond to all diverse populations and ever-changing daily realities of every classroom using its program.

90

We hire teachers for their expertise, insight, and constructive problem-solving, not to be mere automatons following a, “teacher-proof,” curriculum. Maintaining unquestioned fidelity to a purchased program is questionable itself.

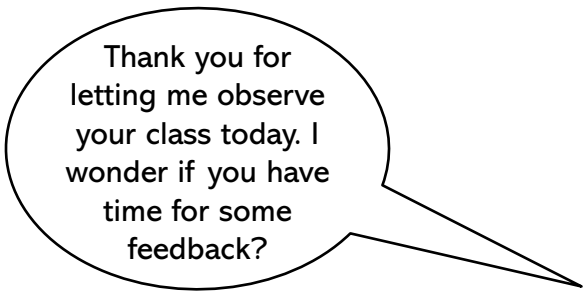
91

Instead, invite teachers to respect the program elements and suggested sequence, and to deviate only as needed to improve the learning for individual students over that which could be achieved when using the program alone.

92

Consider E- or digital portfolios carried over several years. Students maintain science, Spanish, CTE, physical education, math portfolios, and similar over all three years of 3rd, 4th, and 5th grades, for example. When we do this, it doesn't matter what summer or school year a student learns the material, he is given full credit for competencies as demonstrated.

93



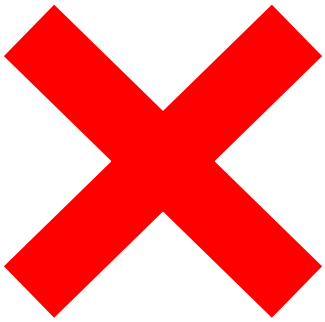
Feedback isn't something to endure; it something to welcome. See it as an indicator of authentic caring. Worry when there's no feedback.

94

Effective teachers remain empathetic with learners, seeing content through first-time eyes. We can be so overly familiar with our content, we struggle to empathize with first-time learners and, as a result, are less effective with students.

95

Grades are not transactions!
Grades are accurate communication,
not compensation, reward, affirmation,
validation, or what a child deserves.



96

Stop & Consider:

Recovering from failure in full teaches more than being labeled for failure ever could teach.

97

Everything is formative until it's not.

To be clear, anything originally designated as summative can become a formative any time we think we can improve learning.

98

Let's see learning clearly: **Re-do's and Re-takes are legitimate practices.**

99

Incompetence in a subject is never maturing, preparatory, or engaging. 'Just sayin'.

100

It is a form of **educational malpractice** to deny students' the opportunity to re-learn and re-assess. Such policies are based on false notions of how to teach responsibility and how professionals become competent in their fields, they lack basis in cognitive psychology research, and they cast real doubt on the teacher's genuine interest in student learning and success. As such, they have no place in an effective teacher's repertoire.

101

Memorization still matters, even in a world in which we can look it up.

www.amle.org/memorization-still-matters/

102

Laziness is not a natural resting state of humans. Our natural state is one of curiosity, a need to belong, to participate, contribute, build, learn complex things, and be successful.

If performance on homework indicates students are out of their depth, and maybe don't belong in the class, students will avoid doing it, choosing instead to self-preserve and save face. They'd rather you thought them irresponsible than find out they can't read on grade level.

103

Quite often, we've advanced in education by transcending the metaphor that guides our current thinking. No one teaching today thinks of a child as a blank slate anymore (John Locke, *Tabula rasa*).

How are our current metaphors for teaching and leading limiting us, and to which metaphors do we turn in order to be effective?

104

From Professor Alane Starko in her book, *Creativity in the Classroom*:

- Gutenberg developed the idea of movable type by looking at the way coins were stamped.
- Eli Whitney said he developed the idea for the cotton gin while watching a cat trying to catch a chicken through a fence.

105

Pasteur began to understand the mechanisms of infection by seeing similarities between infected wounds and fermenting grapes.

Einstein used moving trains to gain insight into relationships in time and space.

106

- **Making connections.**
- **Re-coding something we're learning in terms of something we already understand.**
- **Using the content or skills in the pursuit of something we value.**
- **Using our efforts/talents in the service of others**

107

"…[*B*]y editing the code, to reprogram how cells operate and thereby switch off the cancerous ones. In an interesting example of mixed scientific metaphor, we now hear much talk of using CRISPR—the molecular 'scissors'—to 'edit' genes."

- https://iai.tv/articles/all-science-is-based-in-metaphor-auid-1809

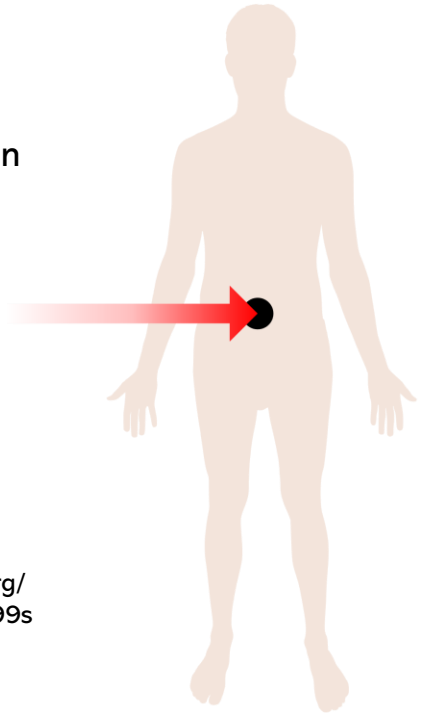
108

This reveals that there is a coevolution of our technologies with the metaphors and models that help us make sense of the world. Our technologies, metaphors, and the desiderata for what we consider a good explanation or description are constantly changing, feeding off one another in a kind of mutually beneficial symbiotic relationship…This is why the philosopher of science Ernan McMullin said that, **"Science aims at ever more fruitful metaphor and at ever more detailed structure."**

- https://iai.tv/articles/all-science-is-based-in-metaphor-auid-1809

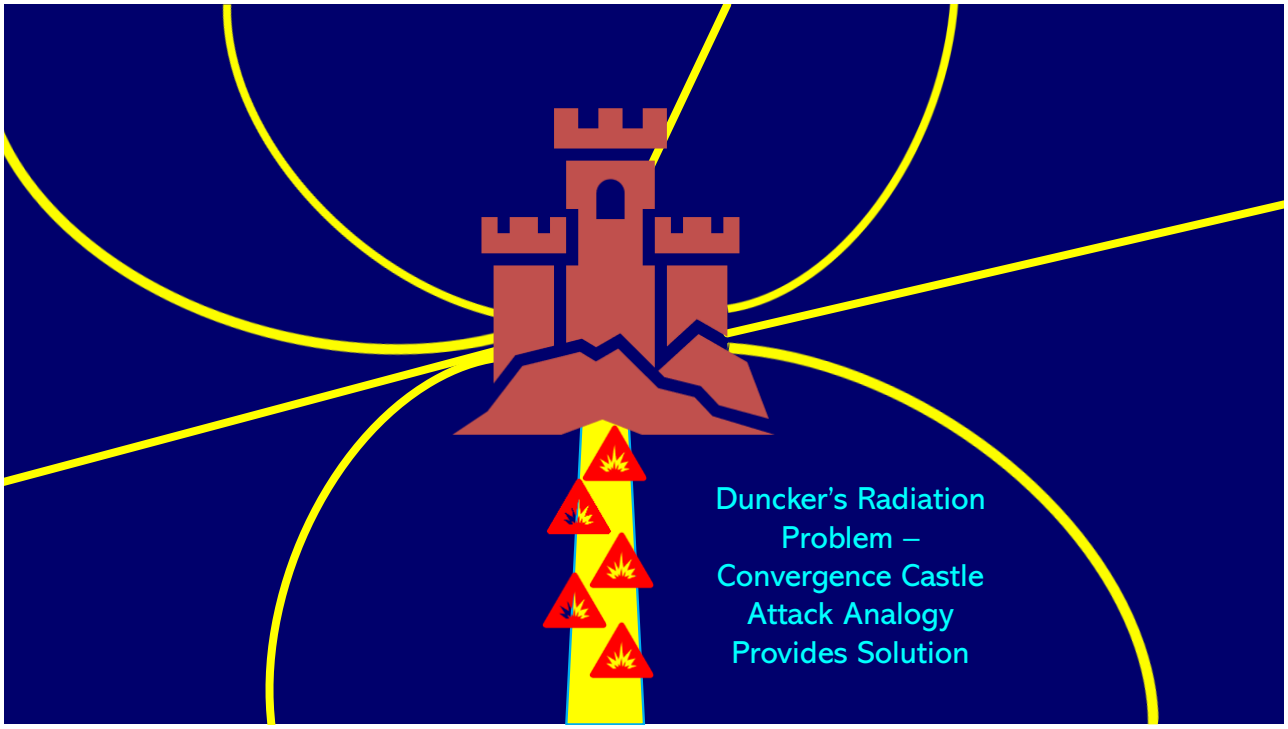
109

Duncker's Radiation Problem



Graphics from:
https://commons.wikimedia.org/wiki/File:Duncker%E2%80%99s_Radiation_Problem.svg

110



111

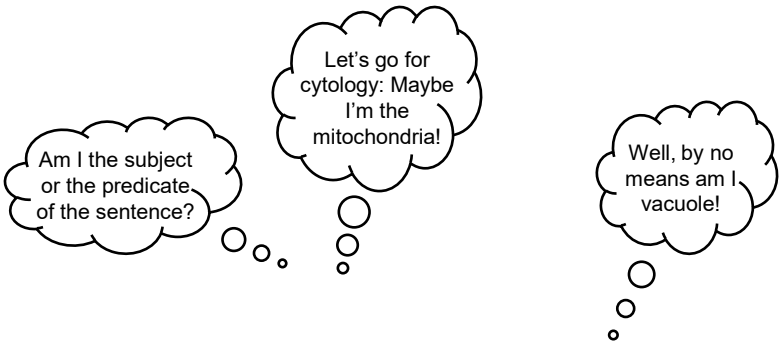
Same Concept, Multiple Domains

The Italian Renaissance: Symbolize curiosity, technological advancement, and cultural shifts through mindmaps, collages, graphic organizers, paintings, sculptures, comic strips, political cartoons, music videos, websites, computer screensavers, CD covers, or advertisements displayed in the city subway system.

The economic principle of supply and demand: What would it look like as a floral arrangement, in the music world, in fashion, or dance? Add some complexity: How would each of these expressions change if were focusing on a bull market or the economy during a recession?

112

Geometric progression, the structure of a sentence, palindromes, phases of the moon, irony, rotation versus revolution, chromatic scale, Boolean logic, sine/cosine, meritocracy, tyranny, feudalism, ratios, the relationship between depth and pressure, musical dynamics, six components of wellness, and the policies of Winston Churchill can all be expressed in terms of: food, fashion, music, dance, flora, fauna, architecture, minerals, weather, vehicles, television shows, math, art, and literature.



Same Concept, Multiple Domains

113

Great Resources on Metaphors

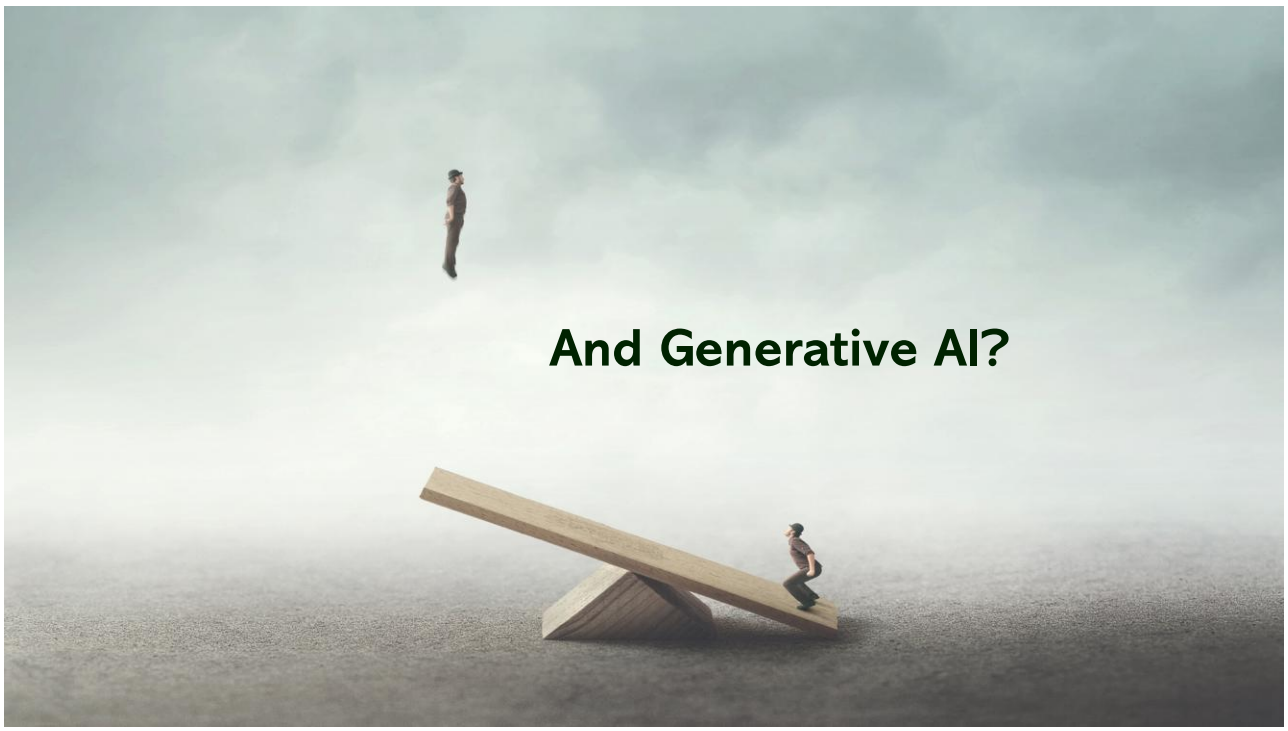
- *From Molecule to Metaphor: A Neural Theory of Language* by Jerome Feldman
- *Metaphor: A Practical Introduction* by Zoltan Kovecses
- *Poetic Logic: The Role of Metaphor in Thought, Language, and Culture* by Marcel Danesi
- *Metaphors & Analogies: Power Tools for Teaching any Subject* by Rick Wormeli
- *I Is an Other: The Secret Life of Metaphor and How It Shapes the Way We See the World* by James Geary

114

Great Resources on Metaphors

- *Metaphors We Live By* by George Lakoff
- *The Political Mind: Why You Can't Understand 21st-Century American Politics with an 18th-Century Brain* by George Lakoff
- *A Bee in a Cathedral: And 99 Other Scientific Analogies* by Joel Levy
- *On Metaphor (A Critical Inquiry Book)* edited by Sheldon Sacks

115



116

In the modern era,
what does it mean
to learn something?

Your answer changes almost everything when it comes to how we use generative Artificial Intelligence in our classrooms.

117

Sample Definitions of Learning from Researchers and Cognitive Scientists

- "We define learning as the transformative process of taking in information that—when internalized and mixed with what we have experienced—changes what we know and builds on what we do. It's based on input, process, and reflection. It is what changes us."
  –From The New Social Learning by Tony Bingham and Marcia Conner
- "Acquiring knowledge and skills and having them readily available from memory so you can make sense of future problems and opportunities." - Make It Stick: The Science of Successful Learning by Peter C. Brown, Henry L. Roediger III, Mark A. McDaniel

118

Sample Definitions of Learning from Researchers and Cognitive Scientists

- "Learning involves strengthening correct responses and weakening incorrect responses. Learning involves adding new information to your memory. Learning involves making sense of the presented material by attending to relevant information, mentally reorganizing it, and connecting it with what you already know."

  - From *eLearning and the Science of Instruction* by Ruth C. Clark and Richard E. Mayer

119

Sample Definitions of Learning from Researchers and Cognitive Scientists

- "Learning is a change in long term memory." - Kirschner, Hendrick, *How Learning Happens: Seminal Works in Educational Psychology and What They Mean in Practice*
- "Learning is referred to as constructionist learning where learners construct mental models to understand the world around them. In this regard, learning is viewed as a reconstruction process rather than as a transmission of knowledge." - Seymore Papert, 1982
- "The acquisition of knowledge or skills through experience, study, or by being taught." – Oxford Dictionary

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Be vigilant: Is it real learning, or the illusion of learning?

121

The slopes are slippery with Generative AI/Chatbots, and the rabbit holes are very tempting:

"Many students say their first instinct is now to ask ChatGPT for help 'brainstorming.' Within seconds, ChatGPT yields a list of essay ideas, plus examples and quotes to back them up. The chatbot ends by asking if it can do more: "Would you like help writing any part of the essay? I can help you draft an introduction or outline a paragraph!"

- Jocelyn Gecker, APNEWS, "The rise of AI tools forces schools to reconsider what counts as cheating," September 12, 2025

122

"AI systems are made for efficiency, not education. They are designed to optimise task completion, minimise friction, and deliver immediate, seemingly correct answers; all virtues in engineering, but vices in learning. LLMs are engineered for user-friendly problem-solving, not for the cognitively effortful process through which understanding is built…Teachers cannot simply "use AI"; they must understand the difference between AI as **cognitive prosthetic** and AI as **cognitive offload**. The former extends what students can do by supporting the processes that build capability; the latter atrophies those processes by replacing them. One is a scaffold that can eventually be removed; the other is a crutch that makes walking without it progressively harder."

- Carl Hendrick, "The Algorithmic Turn: The Emerging Evidence On AI Tutoring That's Hard to Ignore: Are We Approaching A Turing Test for Teaching?," Nov 08, 2025

123

"As Larry Cuban documented in his work on educational technology, we have repeatedly mistaken the novelty of the medium for the substance of the pedagogy…. Many EdTech interventions have been solutions in search of problems, designed by technologists with limited understanding of how learning actually occurs. They have prioritised engagement over mastery, confusing students' enjoyment of a platform with their acquisition of knowledge."

- Carl Hendrick, "The Algorithmic Turn: The Emerging Evidence On AI Tutoring That's Hard to Ignore: Are We Approaching A Turing Test for Teaching?," Nov 08, 2025

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"In a recent study, Michael Gerlich studied the impact of cognitive offloading and critical thinking. 'The findings revealed a significant negative correlation between frequent AI tool usage and critical thinking abilities, mediated by increased cognitive offloading. Younger participants exhibited higher dependence on AI tools and lower critical thinking scores compared to older participants.' (Girlich, 2025) …**In other words, when students offload cognitive tasks to AI, their critical thinking skills diminish."** – Bergmann, 2025

125

"For some learners, AI isn't just used to help them learn; it is a means to skip the learning and get a higher grade. In an article in *The New Yorker*, Ted Chiang recently wrote: "Using ChatGPT to complete assignments is like bringing a forklift into the weight room; you will never improve your cognitive fitness that way."
– Bergmann, 2025

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Perception, memory, decision-making, language, and cognition all happen with systemic and not-so-systemic, i.e., unpredictable, interactions of millions of neural connections among separately activated portions of our brains.

Thinking about ChatGPT-5.0 and Generative A.I.

127

These "circuits" and chance relationships at the moment of input and subsequent processing are constantly evolving based on 3 elements:

- a student's life and classroom experiences
- current physiological growth
- the significant impact of the endocrine (hormones) system, including the effects of growth in each of the pituitary gland, thyroid, hypothalamus, pineal body, adrenal glands, pancreas, ovaries, and testes.

Thinking about ChatGPT-5.0 and Generative A.I.

128

Students are at the forefront of their own learning, not sitting inertly, waiting for it to be packaged and delivered to their intellectual doorsteps. We don't want to, "short circuit," any of this. Here, learning requires vigorous, frequent, and active engagement, not passive observation, and it happens inside students' skulls, not outside.

Thinking about ChatGPT-5.0 and Generative A.I.

129

If someone or something else does the gathering, processing, and learning, then simply presents it to students for them to stack temporarily in their heads, they don't invest in the content, nor do they find it meaningful enough to retain.

Thinking about ChatGPT-5.0 and Generative A.I.

130

"Not long ago, it was common to hear some educators ask, "Why teach it if students can Google it?" With the commercial deployment of chatbots, some educators ask, "why teach it if students can have generative AI do it?" Cognitive science provides an unequivocal answer to these questions: Students need to develop a broad base of knowledge – in their heads – to learn new ideas and navigate the world they experience." -- EDUCATION HAZARDS of GENERATIVE AI, https://www.cognitiveresonance.net/

131

Urgent Concern with the Loneliness Epidemic, Students Befriending Chatbots, AI Therapy, and Sycophancy

Dr. Ricardo Twumasi: "Sycophancy is the tendency of a chatbot to respond positively to a user regardless of the value and the likelihood of the truth of the statement of the user."

132

Helpful Articles:

"Many teens are turning to AI chatbots for friendship and emotional support - As digital technology evolves, psychologists work to understand how it shapes youth's social bonds and connections," Efua Andoh, American Psychological Association, Vol. 56, No. 7, October 1, 2025, https://www.apa.org/monitor/2025/10/technology-youth-friendships

"An AI chatbot pushed a teen to kill himself, a lawsuit against its creator alleges," Kate Payne, APNews, October 25, 2024, https://apnews.com/article/chatbot-ai-lawsuit-suicide-teen-artificial-intelligence-9d48adc572100822fdbc3c90d1456bd0

133

"Their teenage sons died by suicide. Now, they are sounding an alarm about AI chatbots," Rhitu Chatterjee, NPR, September 19, 2025, https://www.npr.org/sections/shots-health-news/2025/09/19/nx-s1-5545749/ai-chatbots-safety-openai-meta-characterai-teens-suicide

"Examining the Harm of AI Chatbots," Written Testimony from Matthew Raine, Father of Adam Raine, Before the United States Senate Judiciary Subcommittee on Crime and Counterterrorism, September 16, 2025 https://www.judiciary.senate.gov/imo/media/doc/e2e8fc50-a9ac-05ec-edd7-277cb0afcdf2/2025-09-16%20PM%20-%20Testimony%20-%20Raine.pdf

134

"Worldwide increases in adolescent loneliness,"
Jean M. Twenge, Jonathan Haidt, Andrew B. Blake, Cooper McAllister, Hannah Lemon, Astrid Le Roy, 01 December 2021,Wiley On-Line Library, https://onlinelibrary.wiley.com/doi/10.1016/j.adolescence.2021.06.006

"Sycophancy is the first LLM 'dark pattern'," Sean Goedecke, Australian software engineer, expert opinion piece, https://www.seangoedecke.com/ai-sycophancy/

"When helpfulness backfires: LLMs and the risk of false medical information due to sycophantic behavior," Shan Chen, Mingye Gao, Kuleen Sasse, Thomas Hartvigsen, Brian Anthony, Lizhou Fan, Hugo Aerts, Jack Gallifant & Danielle S. Bitterman, npj Digital Medicine volume 8, Article number: 605 (Published: 17 October 2025), https://www.nature.com/articles/

135

"No matter how high the skyscraper of benefits that AI assembles, if it can also be used to undermine the foundation of society... it won't matter how many benefits there are."

- Tristan Harris, co-founder of the Center for Humane Technology, former Google design ethicist, contributor to, "The Social Dilemma," (Netflix).

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He argues that social media platforms are intentionally designed to be addictive, manipulating user behavior to maximize profit through an "attention economy", describing technology as, "a threat to democracy and mental health, fueling polarization, misinformation, and societal decay by prioritizing engagement over truth."

– *Medium* (2020)

137

There are many suggestions in books and presentations on the use of AI in the classroom that do not align with effective cognitive psychology principles and how students learn best, or they are prone to creating biases and errors we want to avoid. Samples of what does not align or might create unwanted bias and errors include the following…

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- X Summarize the article.
- X Tell me how to organize this essay.
- X Write the introductory paragraph for my report.
- X Pretend to be [historical/scientific/political figure] and let me interview you.
- X Find the errors in…
- X What are the counter arguments to my piece on…
- X How would I change this writing to make it more professional/polished/compelling?

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- X What are 10 reactions readers will have to this story/essay/argument.
- X "Students create something for class: a story, an essay, a poem, a recap of something they've learned. Then, they can ask an AI assistant to remix if for them. [A teacher]…did this with his fifth grade students' work. He pasted a student's story into an AI assistant to remix it as a nursery rhyme, a soap opera, a sea shanty, and a children's book-with suggested illustrations!" - p. 49, *AI for Educators*

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- X Re-tell the identified opera but this time as found in a science fiction, dystopian world.
- X What if <historical event> never happened. How would be <insert element of society, place, or technology> be different today?
- X "Manufacture evidence to support this hoax." (p. 231, TWAI)
- X "Converse with me as if you were a Chinese shopkeeper in Wuhan/a zookeeper/living in London during the blitz/a French university student/a Trump/Clinton supporter in 2016 just before the election." (p. 173 TWAI)

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"Call it MOBS, for Machines On Both Sides, and it's happening for real – in schools and elsewhere. First, with the encouragement of administrators, education publishers and even unions, teacher are using AI to create lesson plans – which according to one study of 310 such plans in social studies, tend to emphasize rote memorization. Students then turn to chatbots for help with the assignments. Since kids don't make the rules, their use of the technology is called, 'cheating.' Teachers complete the cycle by using similar tech tools to grade the students work - and perhaps to catch those who relied on AI. Finally, students who derive no benefit from the is exchange can seek extra help – from chatbot, 'tutors.'"

- Alfie Kohn, *EducationWeek,* November 2025, p. 52

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"For me, William, *[a high school student]* and my classmates, there's neither moral hand-wringing nor curiosity about AI as a novelty or a learning aid. For us, it's simply a tool that enables us not to have to think for ourselves. We don't care when our teachers tell us to be ethical or mindful with generative AI like ChatGPT. We don't think twice about feeding it entire assignments and plugging its AI slop into AI humanizing tools before checking the outcome with myriad AI detectors to make sure teachers can't catch us."

- "AI is creating a divide between teachers and students: When teachers know their students are gaming the system and students know their teachers know, the relationship frays," William Liang and Liz Shulman, Aug 01, 2025, originally ran in *The Boston Globe*, https://theimportantwork.substack.com/p/ai-is-creating-a-divide-between-teachers

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William continuing] "When teachers know their students are gaming the system and students know their teachers know, the relationship frays. Why bother listening to feedback when we didn't write the work anyway? Why respect a teacher's guidance when the online "tutor," the one that answers instantly, is open in another tab? Why bother learning when schools are encouraging their teachers to deploy AI tools in the classroom and thereby effectively telling us we don't need to learn?"

- "AI is creating a divide between teachers and students: When teachers know their students are gaming the system and students know their teachers know, the relationship frays," William Liang and Liz Shulman, Aug 01, 2025, originally ran in *The Boston Globe*, https://theimportantwork.substack.com/p/ai-is-creating-a-divide-between-teachers

144

Some of the Cool Things Generative AI Can Do For Educators

- Track data
- Help students self-monitor learning progress
- Supplemental subject tutor (individual and small group)
- Take notes
- Estimate/predict
- Model concepts, ideas, data sets
- Create a virtual lab to test ideas (p. 71, *AI for Educators*)
- Create discussion prompts & analogies appropriate for today's students

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Some of the Cool Things Generative AI Can Do For Educators

- Automate tasks
- Classify/Organize
- Provide some or initial feedback
- Summarize research articles for teachers to consider
- Explain text in annotated asides
- Analyze student work and identify patterns where they are confused and need additional instruction
- Generate examples at different levels of proficiency for a standard

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Some of the Cool Things Generative AI Can Do For Educators

- Help teachers figure out how to explain something rather complex to students: To get ideas on how to be clearer, ask the chatbot, "Explain [X] to me as if I was 10 years old."
- Create more choices for students' processing and expression of course content
- Create manageable options for asynchronous learning and assessment
- Help design unusual applications of content, such creating a themed, escape room dedicated to unit content

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Some of the Cool Things Generative AI Can Do For Educators

- Provide tools for students to use as THEY design infographics or a Magna/anime graphic novel depicting content
- Identify groups/cultures/gender not equally represented in assignments and graphics
- Visualize data (Re-express it in graphic representations) to see patterns and issues otherwise not detected

148

Some of the Cool Things Generative AI Can Do For Educators

- Create multiple, alternative versions of the same test when doing re-assessing
- Create the design sequence or map for a project, such as using GANTT models ["11 Gantt Chart Examples For Project Management, Bronywn Kienapple, 5/10/23, https://venngage.com/blog/gantt-chart-example/
- Create and Curate primary sources and on-line tutorials for students
- Customization of learning and assessments for individual students

149

Consider…

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Teachers are stressed out. Do not make the mistake of thinking that we can give teachers even more responsibilities and more children to teach because AI can do so much more of their jobs for them. Instead, change the conditions of teaching so that teachers can be effective with students and still retain mental and physical health…You know, something reasonable and doable.

151

Teachers' expertise in their subject areas and their dedication to academic standards increase the likelihood of honest, versatile, and effective use of AI tools. Absent subject expertise and dedication to standards, teachers are more likely to use AI in ways that actually diminish their instructional effectiveness, assessment design, and connections with students.

152

In order to move content to long-term memory, do not short-cut anything that is an important thought process for students to experience Never let A.I. think for a student what she can think for herself.

153

Ask students to create the first draft of anything on their own without benefit of AI.

154

Regularly re-visit what learning really means in your subject area, how it is achieved, and how it is demonstrated accurately. Any one of these can change in the era of generative AI.

155

Move away from emphasizing and reporting what students do, and instead, emphasize and report what students learn, making sure that expressions of student learning demonstrate what students know and can do independently.

"If only the outcome matters, students will rightly be tempted to use AI. If we want students to value the learning itself, we need to clarify the value of the process." (p. 192 TWAI)

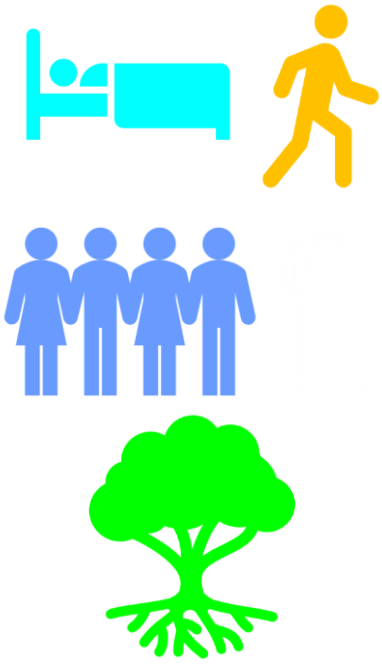
156

Grade your students' work, don't outsource it. When we grade students' learning ourselves, we create advocating relationships with the students, thinking deeply about the most helpful feedback and what their efforts mean for next steps in instruction.

157

"Real relationships have friction, and that conflict and disagreement are useful. We learn from each other and learn to trust as we overcome difficulty. AI could easily diminish the incentive to interact with an inconsistent, sensitive, or emotional human." (p. 29, TWAI)

158



In a world of screens, assist students and their families as they try to increase these five important elements in students' learning and maturation

159

Access to generative AI tools is an advantage for many students whose families and situations can afford that access. What do we do, then, with our students living in poverty who do not have access or the capacity to pay for that access? Allowing and encouraging student use of AI makes an already widening gap between the haves and have-nots even wider.

160

AI can often amplify bias. Remain vigilant about the misinformation, biases, and stereotypes perpetuated by AI that we and students use.

[Suggested resource - https://www.amle.org/five-ethical-considerations-to-keep-in-mind-before-using-ai-in-your-classroom/]

161

What is lost when teachers primarily use AI to generate lesson plans?

- Content intimacy, extensions, nuance, tangential thinking, critical-thinking, & wider connections and parallels
- Instructional versatility in the moment of teaching students

The lack of intellectual wrestling with content and how to teach it to diverse students limits teacher effectiveness in the actual moments of teaching.

Additional and quite serious concern when it comes to plagiarism: Where did AI get those lesson ideas, and are we comfortable using strategies developed by others, taken without their permission, attribution, or compensation, and claiming these ideas as, "our," lesson plans?

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Sample Privacy Concerns

Feeding student work into AI detectors helps AI learn. It draws upon those examples as it responds to current and future prompts. Students' work used in this way may be put to other purposes and is not protected. There are privacy, copyright, and plagiarism issues every time we or students use AI to generate something.

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Sample Privacy Concerns

Before getting too far into AI, know the major laws and regulations governing student privacy, including the Family Educational Rights and Privacy Act (FERPA - https://studentprivacy.ed.gov/ferpa) and the Children's Online Privacy Protection Act (COPPA - https://www.ftc.gov/legal-library/browse/rules/childrens-online-privacy-protection-rule-coppa).

164

"…[C]hildren under 13 are not allowed to use ChatGPT because if OpenAI knowingly collects data from this age group, they would violate COPPA."
"If a teacher uploads a spreadsheet of student names and grades to a GenAI chatbot and prompts it to write feedback emails to each student, this could violate…FERPA because the teacher would be giving away students' education records to the GenAI company without their permission."

– Torrey Trust, Robert W. Matoy, "AI and Ethics: What School Leaders Need to Know," *Education Leadership*, ASCD, February 2025, Volume 82, Number 5, p. 31

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"Many of the popular GenAI technologies were trained on copy-righted text and media without permission from, or compensation to, artists and authors (Chesterman, 2024), in addition to exploited labor from the global south (Perrigo, 2023) and the free human labor of users."

– Torrey Trust, Robert W. Matoy, "AI and Ethics: What School Leaders Need to Know," *Education Leadership*, ASCD, February 2025, Volume 82, Number 5, p. 34

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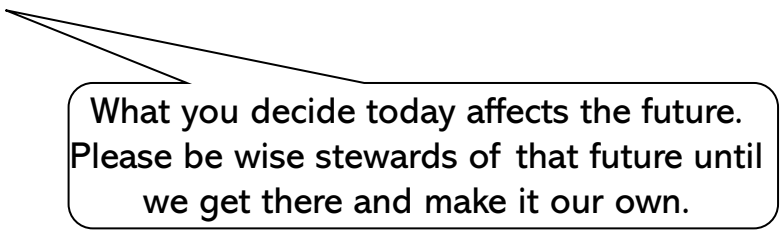
- "Understanding the AI Class Action Lawsuits Artificial Intelligence," May 6, 2025 https://authorsguild.org/news/ai-class-action-lawsuits/
- "AI firm Anthropic agrees to pay authors $1.5bn to settle piracy lawsuit," September 5th, 2025, https://www.bbc.com/news/articles/c5y4jpg922qo

167

Finally, we have to ask: How do we justify using generative AI, given its increasingly negative environmental impact?

168



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Essentials – Strengthen your foundation through time-tested practices and core principles.

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Exploration – Engage in professional growth by testing and adapting practices that are still taking shape.

171

Breakthroughs – Lead boldly by challenging assumptions and pushing beyond traditional boundaries.

172

“I like, I wish, What if”

(p. 121, Seelig)

173

Many different faiths declare we are built for two callings (Rev. James Lee, HOPE Church, NJ). The same can be said about us, today’s educators:

- We are to create.
- We are to bear responsibility.

-

Let’s get to it.

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