developing 21st century skills through discussion
instructors said teaching critical thinking was an essential part of their role

instructors were unable to define what critical thinking was in their domain
instructors said teaching critical thinking was an essential part of their role

89%

instructors were unable to define what critical thinking was in their domain

77%

Paul et al., 1997
canary [kəˈnɛrə]
canary
[kəˈnerē]

1. Are canaries yellow?
2. Do canaries sing?
canary
[kə'nərē]

1. Are canaries yellow?
2. Do canaries sing?
3. Do canaries live in cages?
canary [ˈkəˌnerē]

1. Are canaries yellow?
2. Do canaries sing?
3. Do canaries live in cages?
4. Do canaries lay eggs?
canary
[kəˈnerē]

1. Are canaries yellow?
2. Do canaries sing?
3. Do canaries live in cages?
4. Do canaries lay eggs?
5. Do canaries have lungs?
Experiment A:

1. Set up all the pieces as they would appear during normal game play
2. Briefly show the board to two groups
   a. Grand masters
   b. Novices
3. Ask each group to reconstruct the board
   a. Grand masters ______
   b. Novices ______
Experiment A:

1. Set up all the pieces as they would appear during normal game play
2. Briefly show the board to two groups
   a. Grand masters
   b. Novices
3. Ask each group to reconstruct the board
   a. Grand masters 24-26
   b. Novices 4
Experiment A:
1. Set up all the pieces as they would appear during normal game play
2. Briefly show the board to two groups
   a. Grand masters
   b. Novices
3. Ask each group to reconstruct the board
   a. Grand masters 24-26
   b. Novices 4

Experiment B:
1. Set up all the pieces randomly
   a. Grand masters _____
Experiment A:

1. Set up all the pieces as they would appear during normal game play
2. Briefly show the board to two groups
   a. Grand masters
   b. Novices
3. Ask each group to reconstruct the board
   a. Grand masters 24-26
   b. Novices 4

Experiment B:

1. Set up all the pieces randomly
   a. Grand masters 5-7

Chess Board (32 pieces)
WE THINK IN SCHEMA
ACCORDING TO CONTENT
Research clearly rejects the classical views on human cognition in which general abilities such as learning, reasoning, problem solving, and concept formation correspond to capacities and abilities that can be studied independently of the content domains.
Thinking skills cannot readily be separated from one subject matter and applied to other subject matters. The domain specificity of skills is one of the firmest and most important determinations of current cognitive science.

Hirsh, 2016
21st Century Skills

- Generalizable
- Specific
21st century SKILLS

GENERALIZABLE

SPECIFIC

GENERAL CHARACTERISTICS
DEVELOPED WITHIN
SPECIFIC DOMAINS
1. Explain how to adjust curriculum to accommodate the development of 21st century skills

2. Apply a framework for assessing 21st century skills

3. Utilize online discussions to develop 21st century skills
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Associate Education Designer, Micro-Credentialing
Education Design Lab

designing education toward the future of work
AGENDA

1. Explain how to adjust curriculum to accommodate the development of 21st century skills

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CRITICAL THINKING

“In many ways, critical thinking has become synonymous with higher education . . .
“In many ways, critical thinking has become synonymous with higher education . . .

Is critical thinking an important goal of higher education?
CRITICAL THINKING

“In many ways, critical thinking has become synonymous with higher education . . . Yet we have not found evidence that colleges or universities teach critical-thinking skills with any success.”
CRITICAL THINKING

“In many ways, critical thinking has become synonymous with higher education . . . Yet we have not found evidence that colleges or universities teach critical-thinking skills with any success.”

Why have institutions not had success teaching critical thinking?
3 challenges to effectively teaching 21st century skills

Define it  Teach it  Measure it
3 challenges to effectively teaching 21st century skills

Define it  Teach it  Measure it
SKILLS

Define critical thinking.
Changing behavior through evaluation
Reflective thinking
Drawing conclusions based on observations
Self awareness
Thinking to achieve desired behaviors
Thinking while performing
System for processing information
Active engagement while we think
Thinking independently
Willingness to revise ideas
Using evidence and reason to decide
A process for organizing thoughts
Truth-seeking
Open-mindedness
Analyticity
Systematicity
Self-confidence
Inquisitiveness
Maturity
Define general characteristics
Define the contours of those characteristics within the domain
3 challenges to effectively teaching 21st century skills

Define it  Teach it  Measure it
SKILLS

What challenges would (have) you face teaching 21st century skills?
Teaching skills through lecture
Teaching skills through lecture

Teaching the skill apart from the domain
Teaching skills through lecture

Teaching the skill apart from the domain

Equating academic success with 21st century skill competence
Teaching skills through lecture

Teaching the skill apart from the domain

Equating academic success with 21st century skill competence

Teaching the domain apart from the skill
Teach the skill within the context of the domain
3 challenges to effectively teaching 21st century skills

Define it

Teach it

Measure it
Inability to transform domain assessments to measure applied proficiency
Inability to transform domain assessments to measure applied proficiency

Teaching the skill and domain together but apart from application
Measure the application and demonstration of the skill within the context of domain-specific assessments
Explain how to adjust curriculum to accommodate the development of 21st century skills

**Define it**
Define general characteristics
Define the contours of those characteristics within the domain

**Teach it**
Teach the skill within the context of the domain

**Measure it**
Measure the application and demonstration of the skill within the context of domain-specific assessments
1. Explain how to adjusting curriculum to accommodate the development of 21st century skills

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SKILLS

How does anyone get good at anything?
the belief that a sufficient amount of experience or practice leads to maximal performance appears incorrect.

however . . . the level of performance can be increased even by highly experienced individuals as a result of deliberate efforts to improve
Research shows that to **improve performance** it is necessary to seek out **practice activities** that allow individuals to work on improving **specific aspects**, with the **help of a teacher** in a **protected environment** with **opportunities for reflection** exploration of alternatives and **problem-solving** as well as repetition with **informative feedback**.
INFORM about the general characteristics and domain specific skills
INTERACT to test ideas and learn from others
INNOVATE to demonstrate proficiency at applying the skill within the domain
AGENDA

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Many of the skills suggested in the literature as being critical for workplace success are in very low demand by employers, and some were not found to be mentioned at all (e.g., social responsibility).

What are the top three skills employers are looking for?
Many of the skills suggested in the literature as being critical for workplace success are in very low demand by employers, and some were not found to be mentioned at all (e.g., social responsibility).
The Lab’s 21st Century Skills Micro-credentials

- Initiative: Education Design Lab
- Collaboration: Education Design Lab
- Creative Problem Solving: Education Design Lab
- Intercultural Fluency: Education Design Lab
- Resilience: Education Design Lab
- Critical Thinking: Education Design Lab
- Empathy: Education Design Lab
- Oral Communication: Education Design Lab
What does oral communication look like in practice?

Speak with Clarity and Precision. Identify the core components of a successful elevator pitch including understanding the audience, clarity and brevity; Create and deliver an elevator pitch for a potential employer, colleague, or investor; Cite methods for getting your ideas across quickly and clearly.

Tell Stories to Express Ideas. Understand key components of a compelling story; Develop a concise, meaningful story that communicates a clear message.

Use Appropriate Tone and Word Choice. Demonstrate your use of appropriate tone and word choice for different audiences; Articulate how your own oral communication style is impacted by your surroundings.

Listen Actively. Demonstrate awareness of your own body language and gestures to convey your attention; Discuss components of active listening and why it’s an essential part of collaboration.
inform
learning & practicing

interact
contributing & reflecting

innovate
assessing
inform // interact // innovate

see connections

set conditions

inform // interact // innovate

see connections

sort ideas

# @

thepretzl.com (sign up for free)
This experience showed me that I can clearly identify an area that I deem needs improvement and discuss ways to improve it.

I learned a lot about my own implicit biases and how I could begin to address them.
Interaction is the bridge between information and application
1. Explain how to adjust curriculum to accommodate the development of 21st century skills

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3. Utilize online discussions to develop 21st century skills
Define general characteristics
Define the contours of those characteristics within the domain
Teach the skill within the context of the domain
   Inform about the general characteristics and domain specific skills
   Interact to test ideas and learn from others
   Innovate to demonstrate proficiency at applying the skill within the domain
Measure the application and demonstration of the skill within the context of domain-specific assessments
Interaction is the bridge between information and application