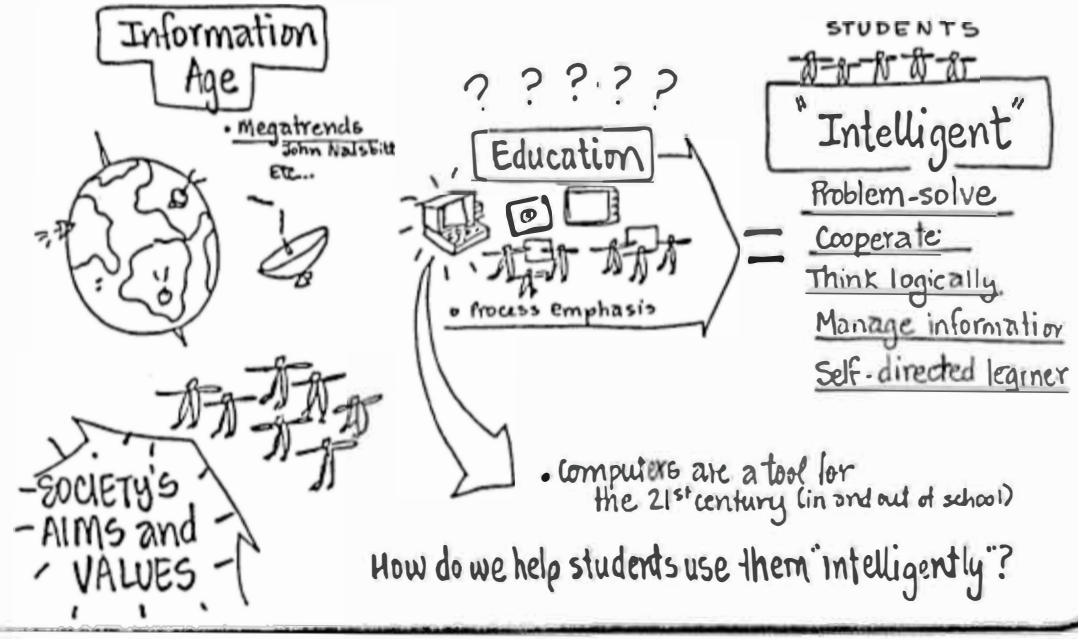
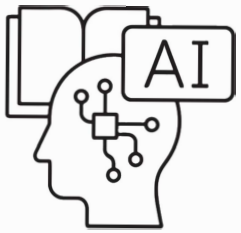
Possible 21st Century Curriculum

What will it look like?





21st Century Roles & Skills

designs opportunities for **Group interaction**; designs debriefing activities to assess **process**

Decentralizes responsibilities for learning to students

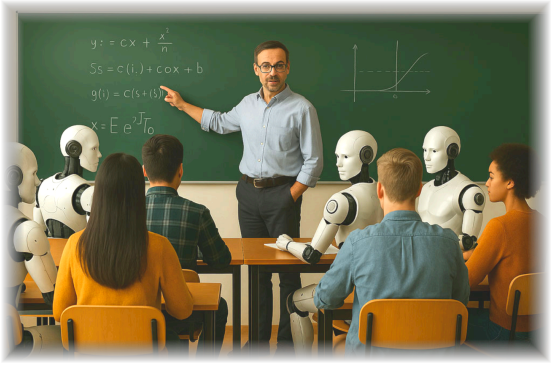
centers learning around **students' interests** and learning styles

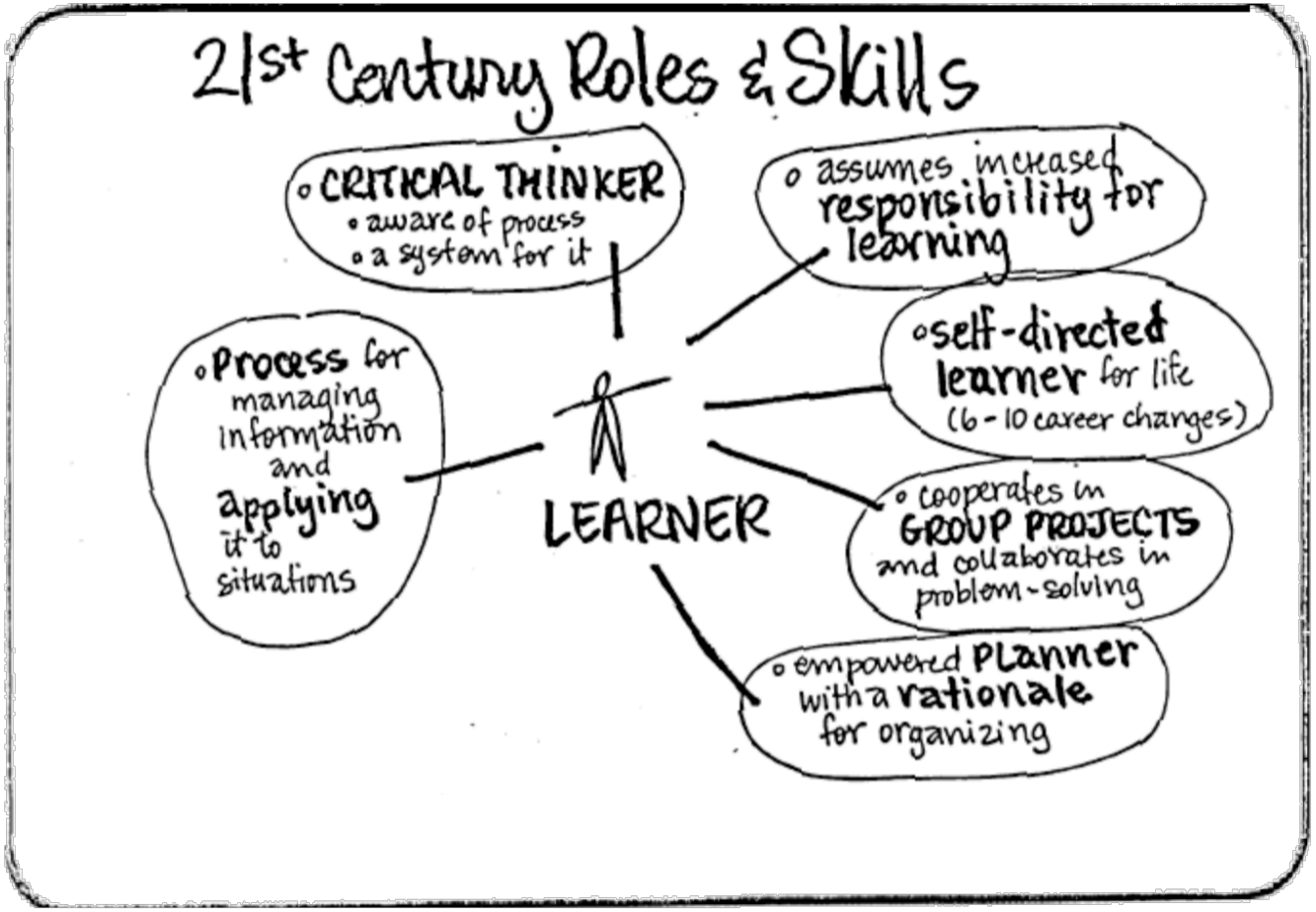
more like "**Coach**", an idea planter and obstacle remover

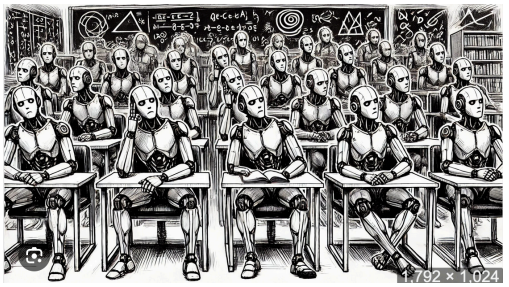
TEACHER

Questions and **cues** to intervene in students' learning process

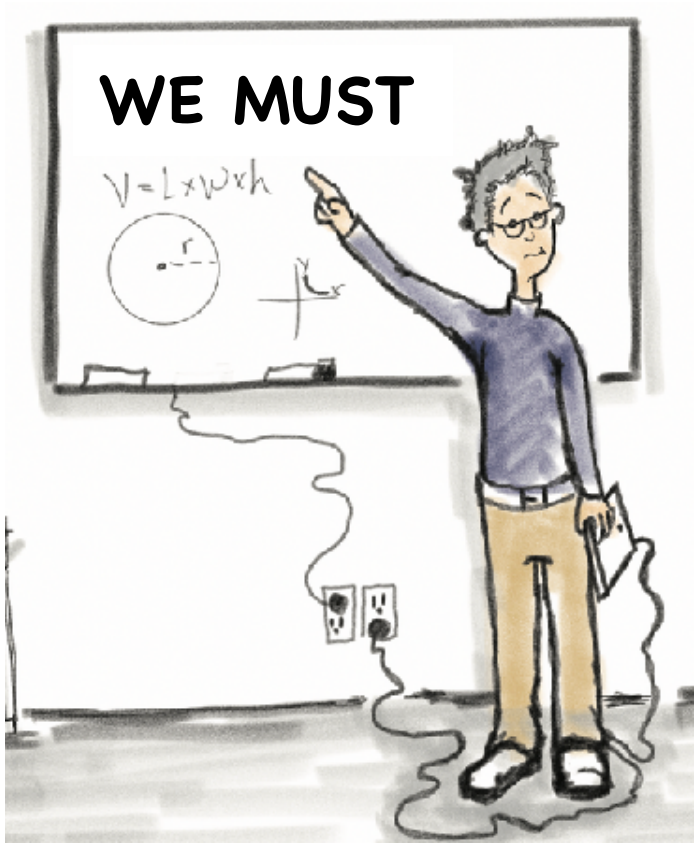
Models a **Variety** of information management strategies (plan, gather, organize...)




21st Century Roles & Skills
CRITICAL THINKER
aware of process
a system for it
assumes increased responsibility for learning
Process for managing information and applying it to situations
self-directed learner for life
(6 - 10 career changes)
LEARNER
cooperates in GROUP PROJECTS and collaborates in problem-solving
empowered Planner with a rationale for organizing


1,792 × 1,024

Success in today's AI age



- know when and what to ask
- understand and evaluate the AI response
- possess the ability to tweak and implement the AI response

All of the above will require an extensive conceptual understanding

Question: A virus has attacked the bean population and is expected to survive a mean duration of time equal to 38.3 months with a standard deviation of 6.5 months. Investigators are hopeful that a new therapy will affect survival. Suppose that the new treatment is administered to 100 cultures. It is observed that the average survival time is 37 months. Can I conclude that this new treatment does really work ?

Response: Yes—but there is an important distinction between "the treatment has an effect" **and** "the treatment works by increasing survival."

1. Set up the hypothesis

The original mean survival is:

$$\mu_0 = 38.3 \text{ months}$$

The sample has :

- $n = 100$
- $\bar{x} = 37$ months
- $\sigma = 6.5$ months

If we're testing whether the treatment increases survival

$$H_0 = 38.3$$
$$H_0 \neq 38.3$$

2. Calculate the z-score

The standard error is

$$SE = \frac{\sigma}{\sqrt{n}} = \frac{6.5}{\sqrt{100}} = \frac{6.5}{10} = 0.65$$

Therefore,

$$z = \frac{\bar{x} - \mu_0}{SE} = \frac{37 - 38.3}{0.65} = \frac{-1.3}{0.65} = -2.00$$

3. Find the *p*-value

For z = - 2.00,

$$P(Z < -2.00) \approx 0.0228$$

Because this is a two-tailed test:

$$p = 2(0.0228) = 0.0456$$

At the usual significance level $\alpha = 0.05$:

$$0.0456 < 0.05$$

So we reject H_0

4. What does that mean?

There is statistically significant evidence that the treatment **changes survival time** at the 5% level.

However, notice the sample mean is **37 months**, which is *lower* than the original 38.3 months.

So if by "works" you mean **increases survival**, then **no, the data do not show that the treatment works**. In fact, the sample suggests survival became shorter.

Bottom line:

- Does the treatment appear to have an effect? **Yes, statistically significant at 5%.**
- Does it appear to **improve** survival? **Nothe observed effect is in the opposite direction.**
- If your class uses a **one-tailed test for improvement**, the result would also not support the treatment, because the observed z = –2.00 is in the wrong direction.