Is Higher Education still Fit for Purpose? The Technology Dimension

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UNESCO
United Nations
Educational, Scientific and
Cultural Organization

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Aalborg Centre for Problem Based Learning
in Engineering Science and Sustainability
under the auspices of UNESCO

Assumption #1: We share a purpose

- Quality technical education
- Graduate employment
- Access to graduate school
- A Pedigree
- A chance to learn from world famous professors
- Support services to ensure you succeed
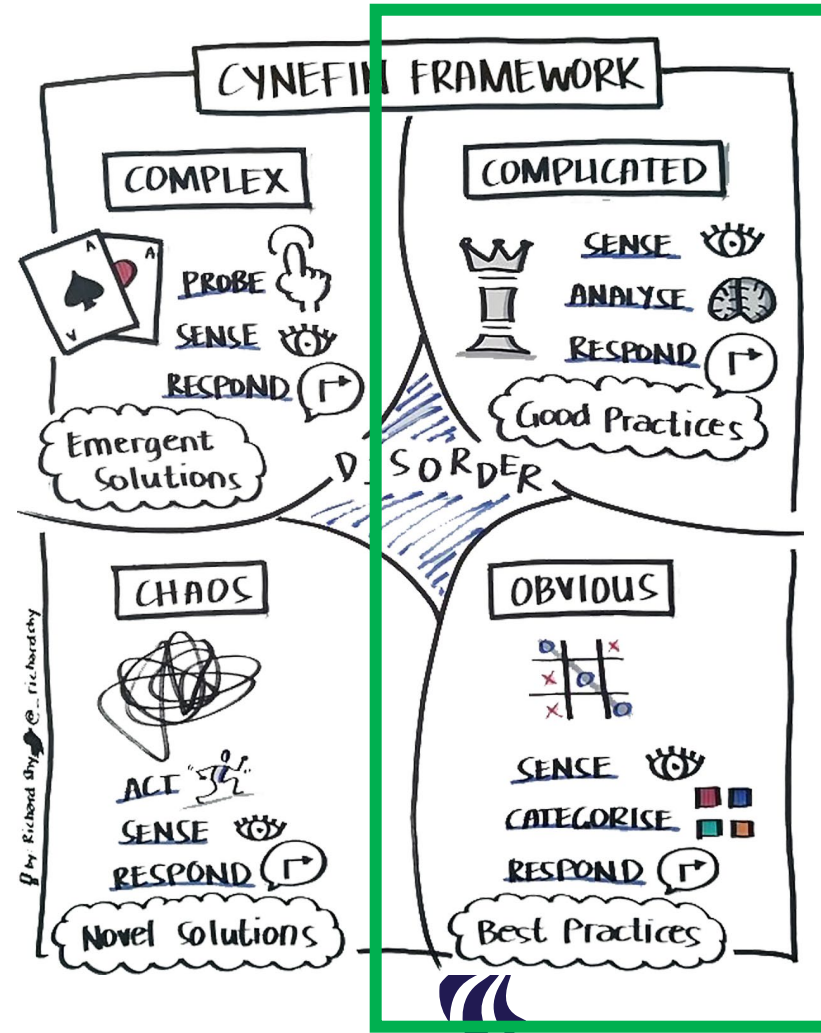- Enrolment when no one else will have you

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Curricula are already evolving

❯ What students should learn

❯ What graduates should be able to do

❯ Who professionals should be

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The Cynefin framework
(Snowden & Boone, 2007)

Which type of problems do we face as a society?

Which type of problems do your students work on?

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Now we have a technology to automate (and scale) knowledge work
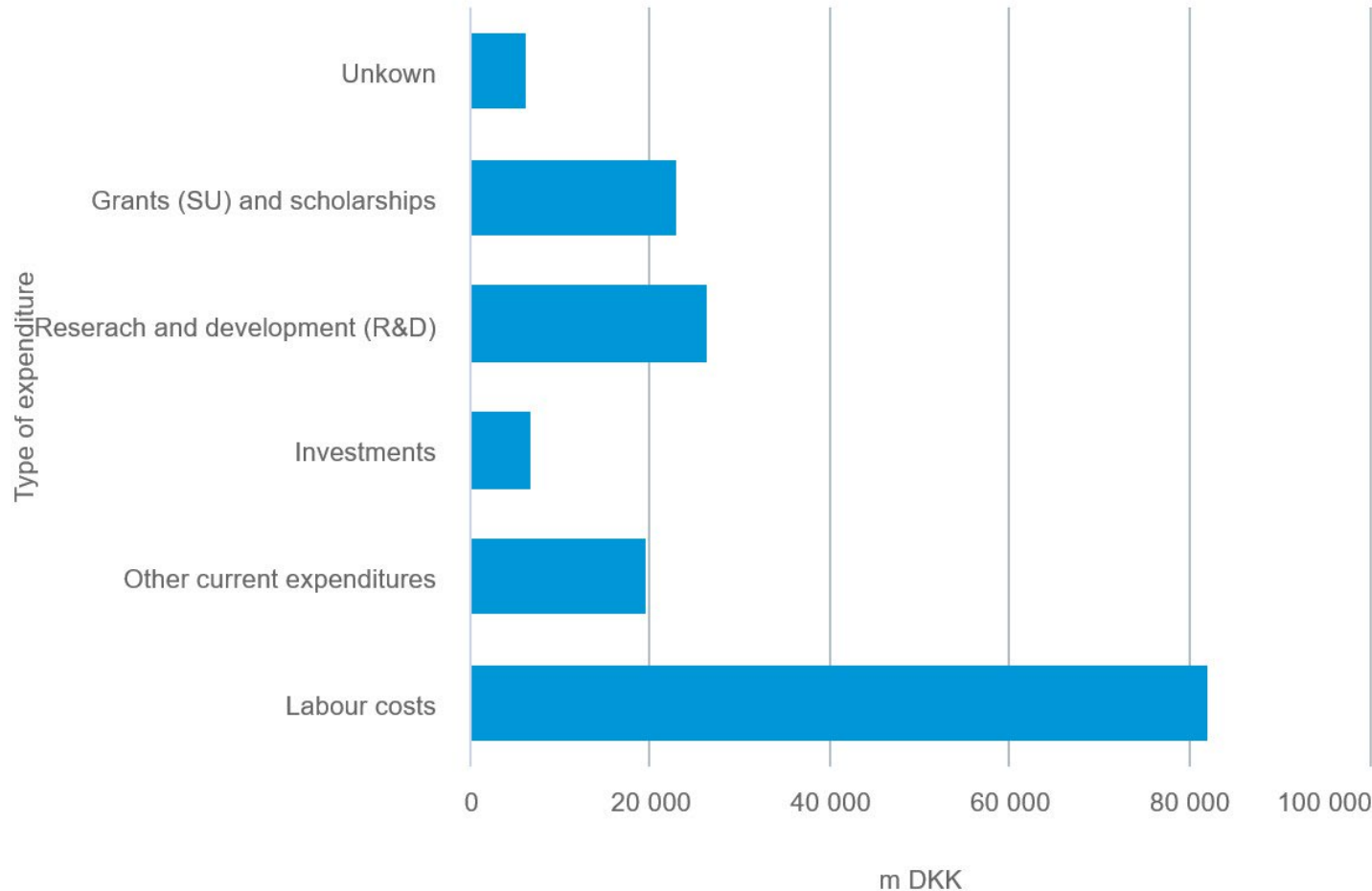
Replacing or augmenting academics?

❯ Technology replaces tasks, not jobs

❯ A bigger field, a better crop, or fewer farmers?

❯ If your people are only doing tasks that can be effectively automated, why do you employ them?

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Education is expensive:

Education expenditure by type of expenditure, m DKK

Time: 2022:

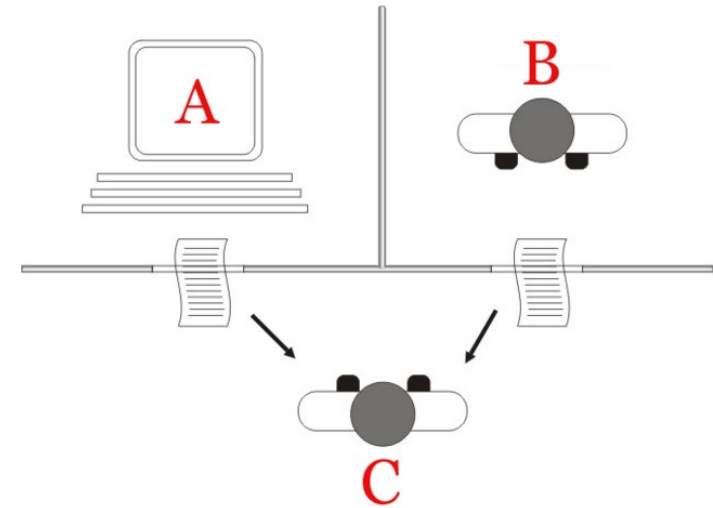In Denmark 3% of GDP is spent on labour costs in education

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Let's make a deal

❯ 90% as good for half the price?

❯ 11% better for double the price?

❯ 90% as good for twice as many students?

❯ It all comes back to your purpose

   ❯ Are you more focussed on the -10% or the +90%?

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What if we could automate the marking?

- Marking vs feedback

- Workload and marker burnout

- Intra-rater reliability

Who should give you feedback?

Wait time

Volume of feedback

Adaptability

Patience

Variability

Trustworthiness

Confidentiality

Explainability

Cost

THE VELUX FOUNDATIONS

VILLUM FONDEN ✕ VELUX FONDEN

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What is actually challenged by techonology?

- ❯ Learning?

- ❯ Assessment?

- ❯ Certification?

- ❯ Comfort?

- ❯ Habits?

- ❯ Identity?

Learning vs assessment vs certification

❯ The things we do to promote learning

❯ The things we do to measure learning

❯ The things we do to vouch for the learning to others
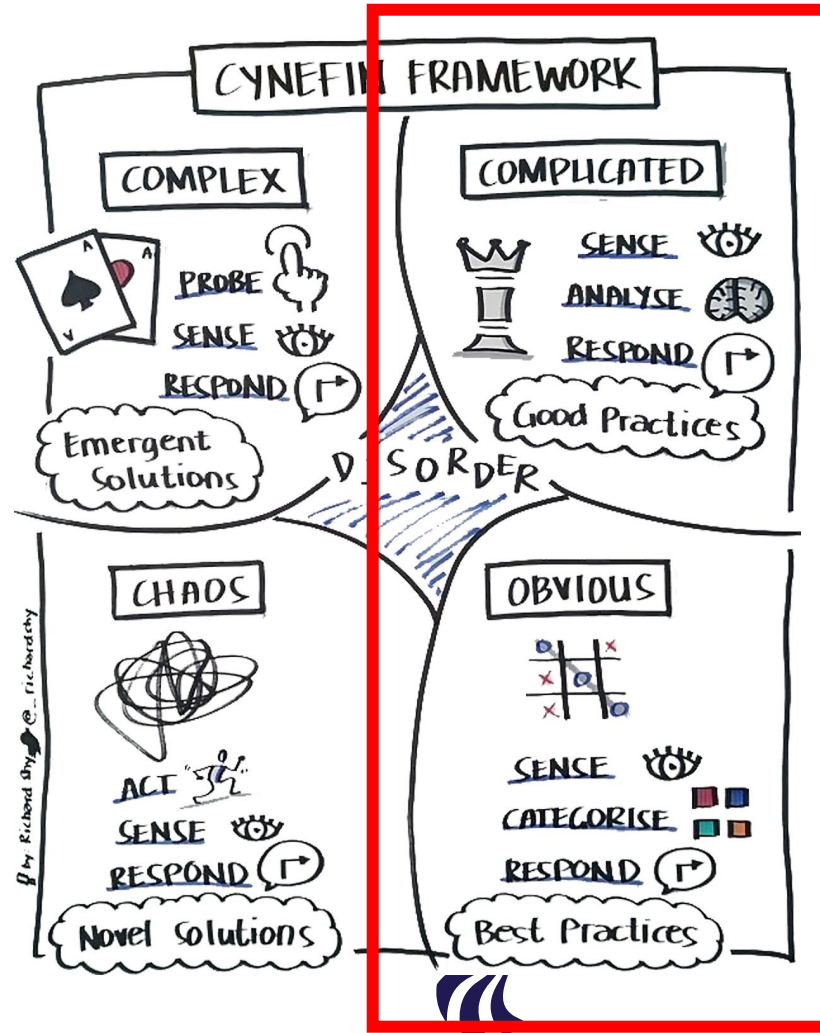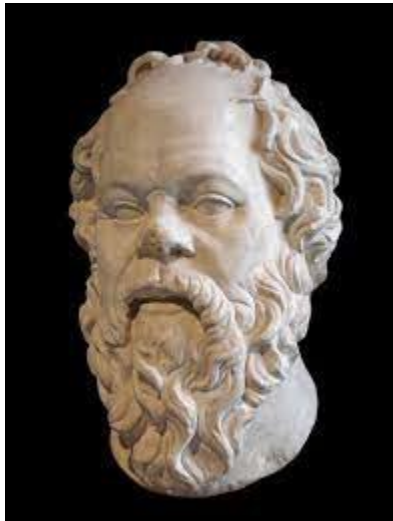
The last two used to be the same

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"The defibrilator problem"

❯ Allows a technology enabled novice to function at a proficient level

❯ Are you measuring proficiency, or development towards expertise?

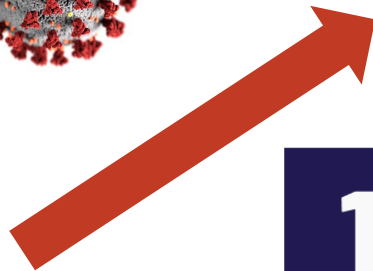# What can we rely upon for certification?

The traditional model worked...

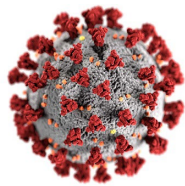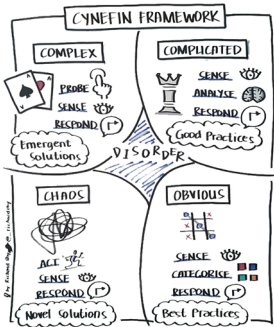
- For its time, and for its constraints

- We have a different setpoint
  - We don't have to be bound by old constraints
  - We shouldn't be bound by old constraints
  - Our graduates don't live in a world bound by the old constraints
  - For many (most?) of us our purpose has changed

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The Kræmergaard Framework

5 GENERATION 4
Digital technologies for personalized hyper-relevant (proactive) services.
Technology as a challenger

4 GENERATION 4
Digital technologies for solving the customer's basic needs in new efficient ways
Technology organization as a digital architect

3 GENERATION 3
Digital technologies for new services and products or in new ways
Digitalization and IT as partners

2 GENERATION 2
Digital technologies for efficiency
IT as a infrastructure provider

1 GENERATION 1
Digital technologies for existing practices and automation
IT as a systems provider

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Emergency Remote Instruction

Which way now?

GENERATION 4
Digital technologies for personalized hyper-relevant (proactive) services.
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GENERATION 4
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Asynchronous, on demand curriculum

- Access when you are ready
  - Or when you need it for your project
- Stop halfway through


- Choose your feedback speed

- Pause

- Repeat

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Generative AI's (possible) roles in learning contexts

GenAI as	Role	Example
Mentor	Give feedback	Here's my argument about [topic]. What are the strengths and weaknesses of my points?
Tutor	Direct instruction	I'm trying to understand [complex topic] better. Can you break it down into simpler terms and explain [specific concept] with examples?
Coach	Promote metacognition	How can I improve my study technique to remember [topic] better?
Teammate	Increase team performance	We're brainstorming ideas for [topic]. Here is a list of suggestions. Can you supplement with other ideas or words that may be relevant to [topic]?
Student	Receive explanations	I'm going to teach you about [topic] and you need to ask questions like a beginner
Simulator	Conscious exercise	You are a [role] and need to enter into a negotiation on [topic] with me...
Tool	Offload tasks	Write an analysis about [topic]

Mollick, E. R. & Mollick, L. (2023): Assigning AI: Seven Approaches for Students, with Prompts. Available at SSRN:
https://ssrn.com/abstract=4475995

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Institutional inertia

❯ The purpose of bureaucracy is to make bad ideas happen slowly

❯ Inertia is different to Resistance

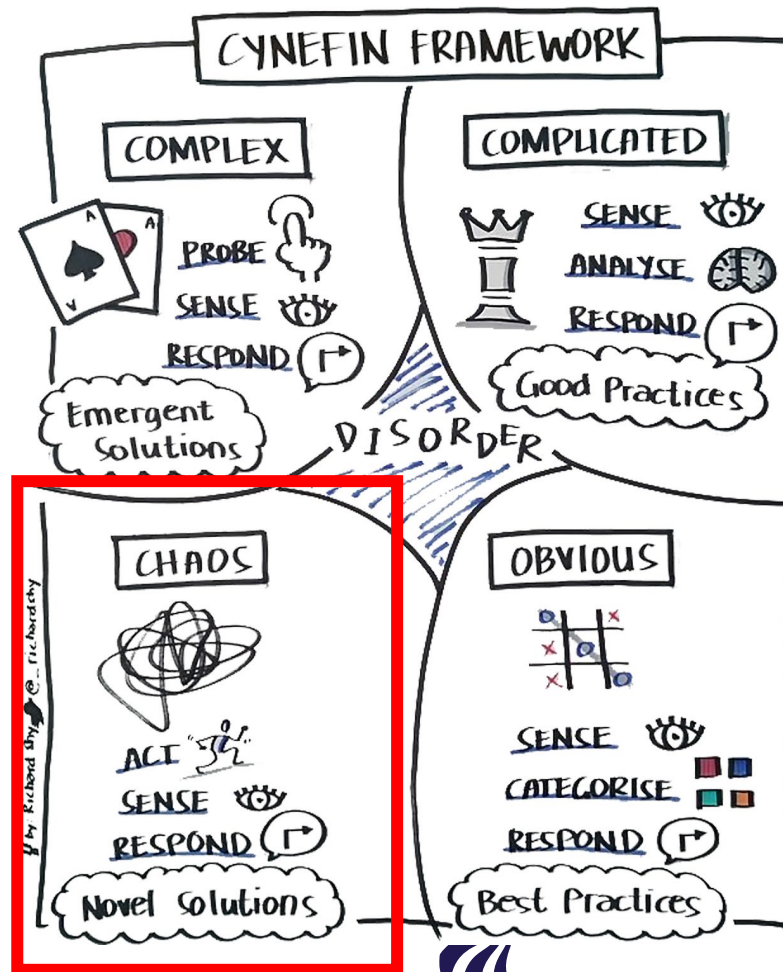   ❯ Inertia says "I don't want to"

    ❯ Resistance says "put it back"
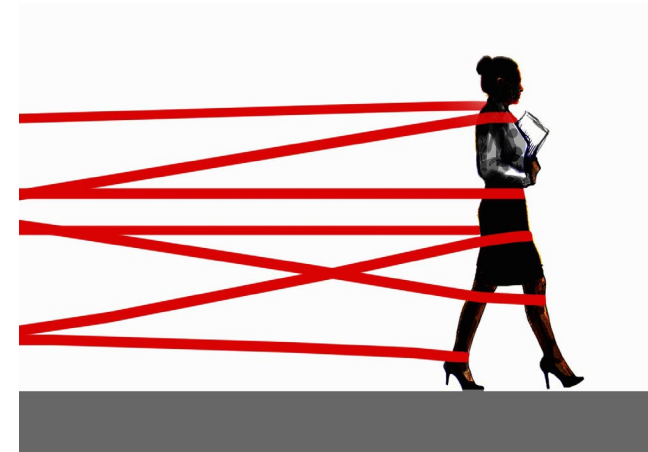
        ❯ Moving slowly can be a big part of our value proposition

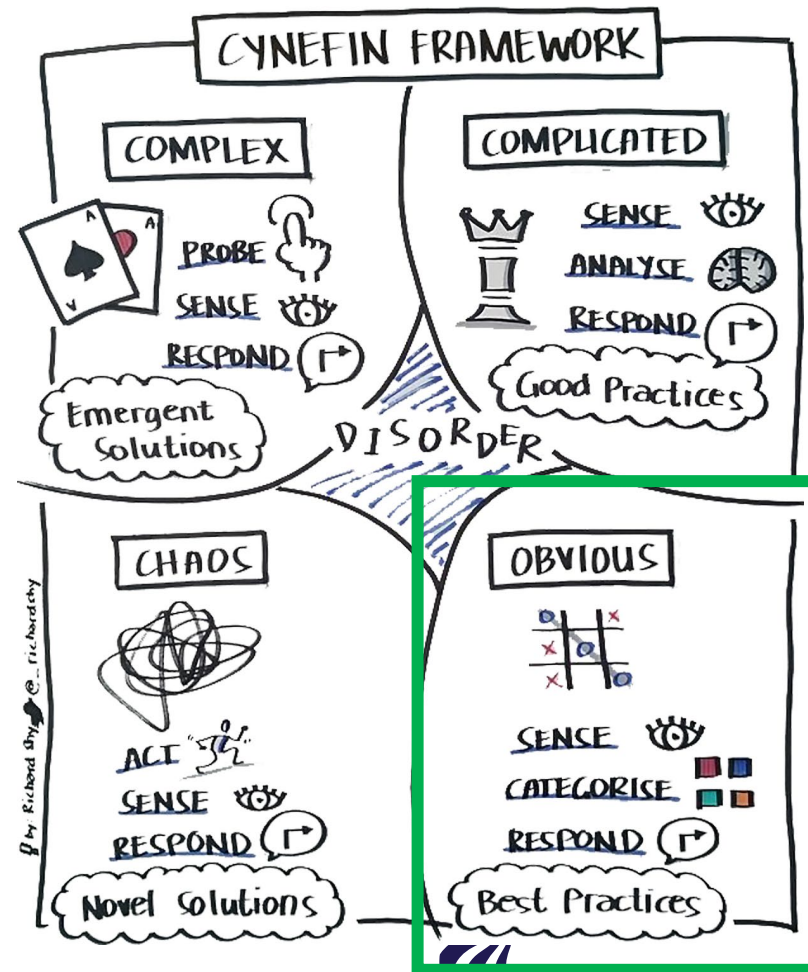   ❯ That is how we build trust

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Teaching with techonology in Universities

- It's a Chaotic problem
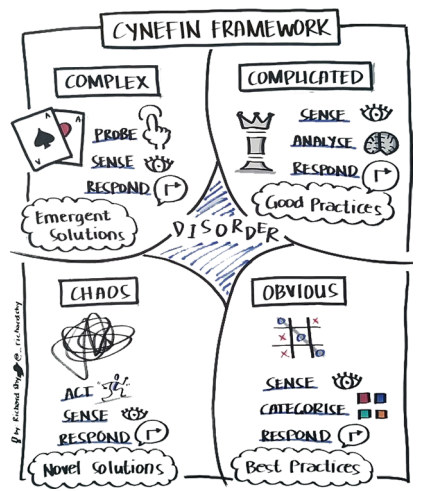
- It's uncomfortable in the chaos quadrant
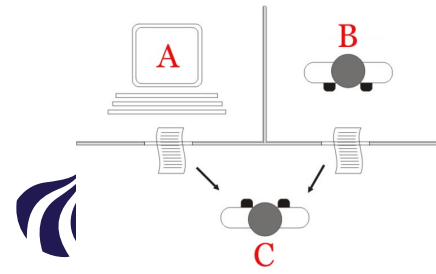
Teaching with techonology in Universities

- Everyone is looking for a Best Practice Solution

- But we don't have them yet

It's a sustainability issue

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