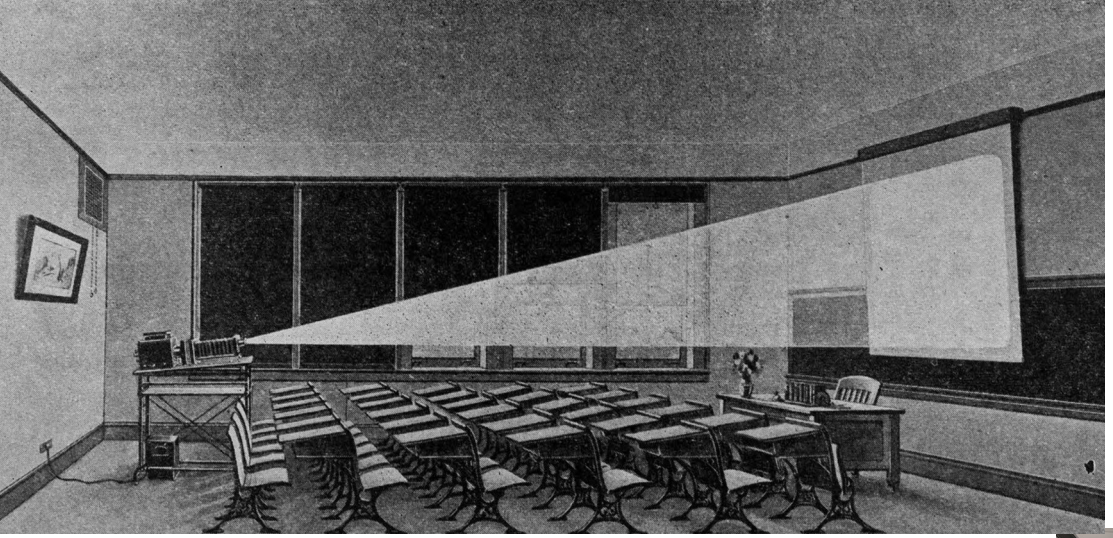

1920

RETHINKING EDUCATIONAL FRAMEWORKS IN THE AGE OF AI: A HISTORICAL PERSPECTIVE

2020

MATTHEW AMES PhD

Contents

The Historical Arc

- Film
- Slides
- Audio
- Radio

The New Premier Pathéscope

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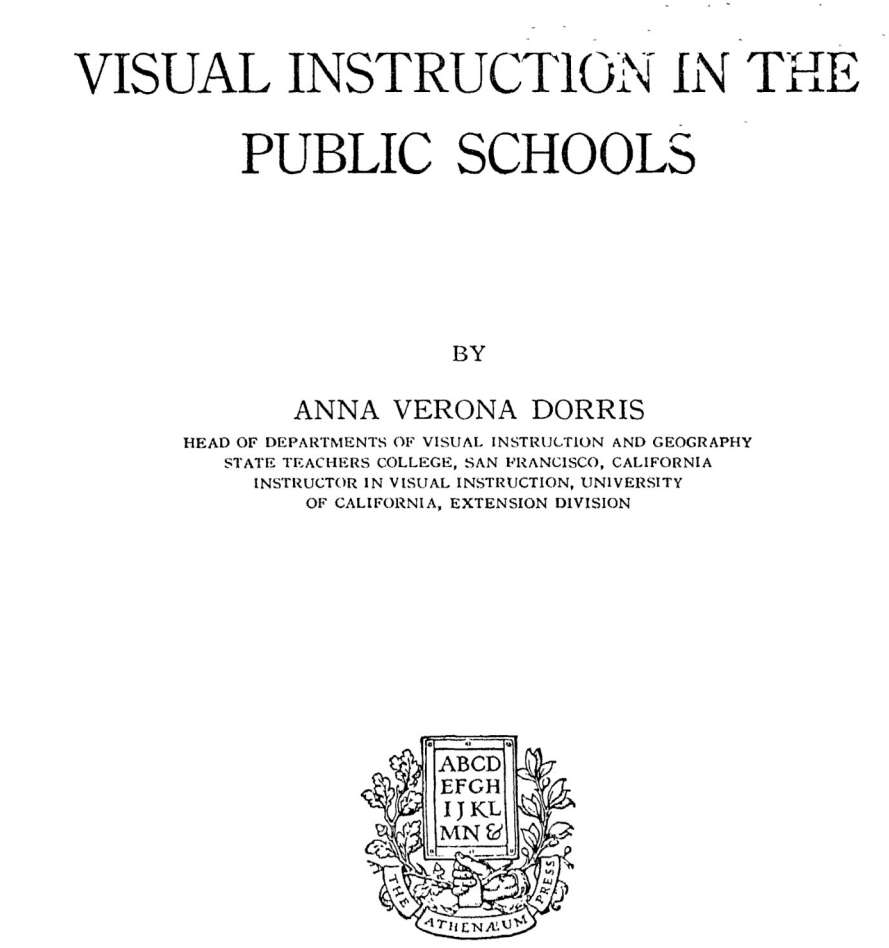
PATHÉSCOPE SAFETY STANDARD — THE PIONEER OF SAFETY PROJECTION

1920

The Historical Arc

Several components of later modern educational technology came from this early period, including:

- Visual education departments
- Textbooks to explain how teachers should use these new tools



VISUAL INSTRUCTION IN THE PUBLIC SCHOOLS

BY

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OF CALIFORNIA, EXTENSION DIVISION

1928

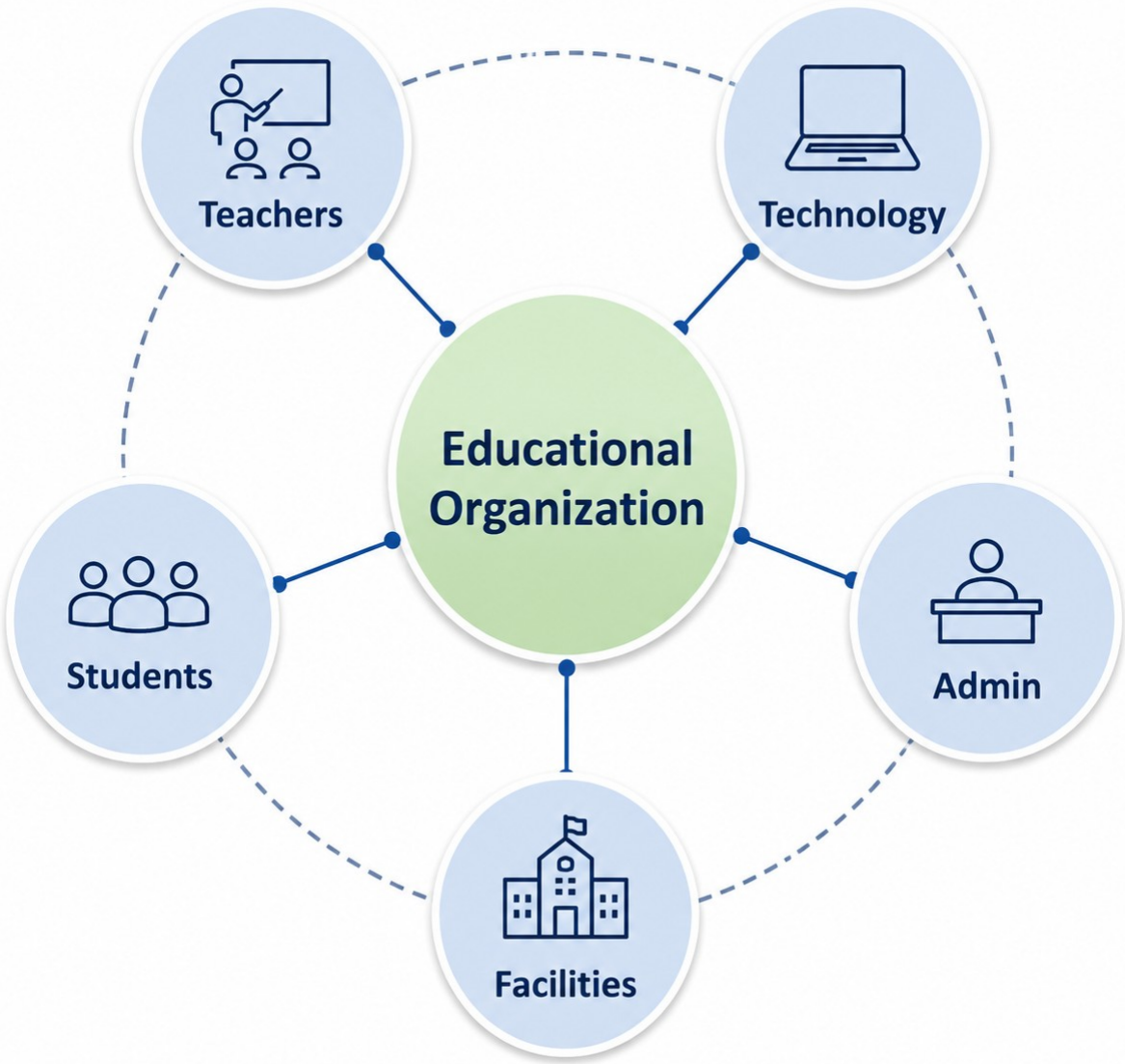
The Historical Arc

Anna Verona Dorris, an early advocate of Visual Instruction, served as a part time Director of Visual Instruction for the Berkeley Public Schools. Her duties there included, ”building up a distributing center, training teachers in methods of procedure, writing monographs with a committee.”

The Historical Arc

James Finn (1950s-1960s) took great steps to define and clarify the field of educational technology. As stated by Stefaniak and Stapleton:

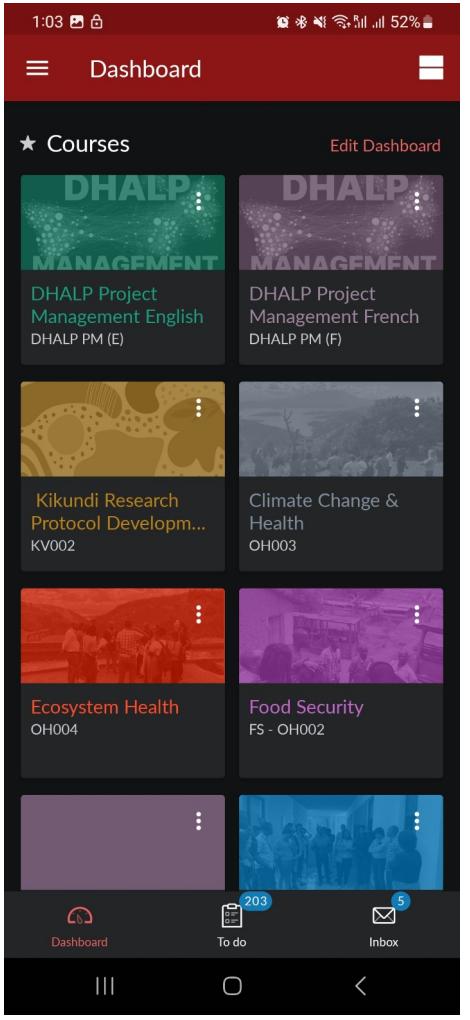
“He had the ability to view a structure, not just in its disparate parts, but also as a whole while noticing the connections,overlap and interactions. By viewing education from this system's lens he was able to view the entire educational organization that included teachers, technology, students, administration and facilities. “



The Historical Arc

1920

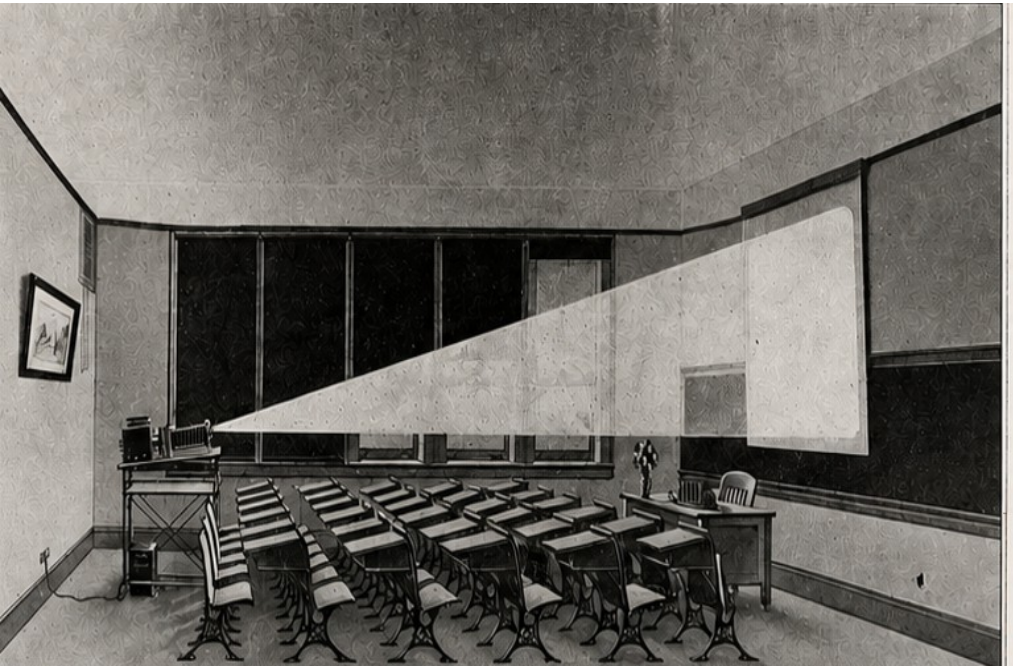
-100 years-
Has the fundamental role of educational technology changed over the last hundred years, or have we mostly become better at delivering information?



2020

The Historical Arc

Despite these technological shifts, the core architecture of education remained relatively stable. Educational technologies primarily functioned as systems for delivering instructional content, supporting a model in which instructors created knowledge artifacts that were then consumed and assessed by students.

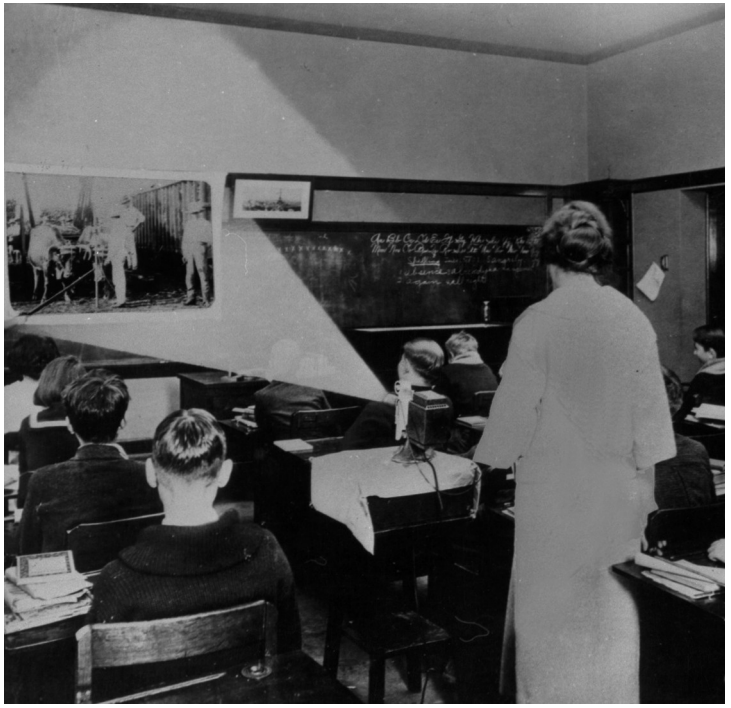


The Provocation

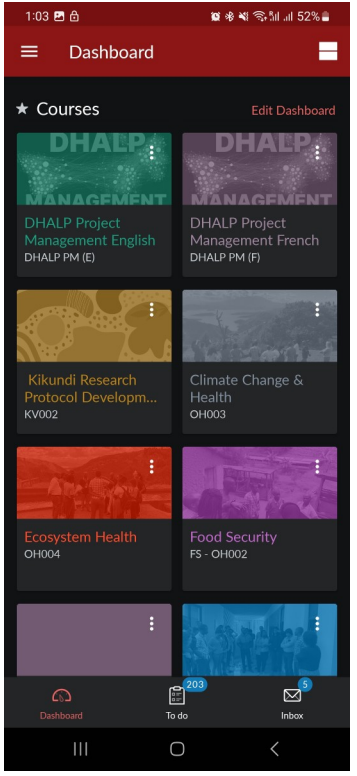
However, now a technology is available that students can interact with that answers questions, helps create presentations, and supports writing. Appears to be very different for past technologies.

The Provocation

If a student can ask an AI tutor a question at 2 a.m., receive explanations at their level, and continue asking follow-up questions indefinitely, what exactly is different from previous educational technologies?



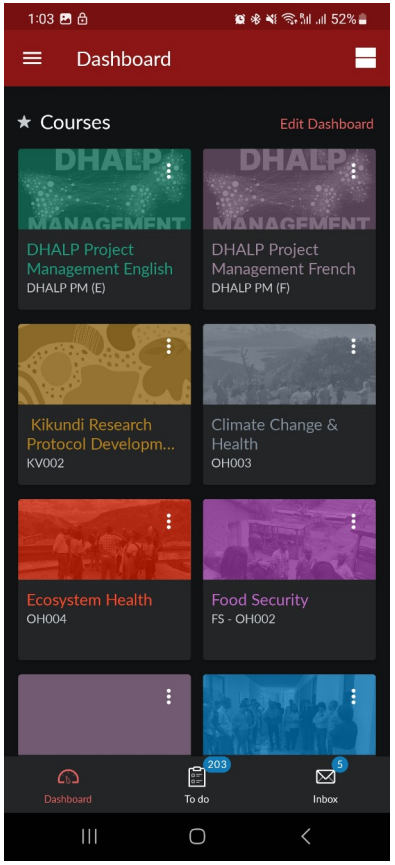
Film



LMS

AI

The Provocation



Two Key Differences:

1) In the 20th century, educational media (films, slides, recordings, software) was typically owned, managed, and distributed by schools through media centers, audiovisual departments, and instructional technology specialists.

2) AI does not simply deliver content; it acts as a cognitive partner in the learner's thinking process, making its capabilities and role in supporting cognition a central educational question.

The Re-frame

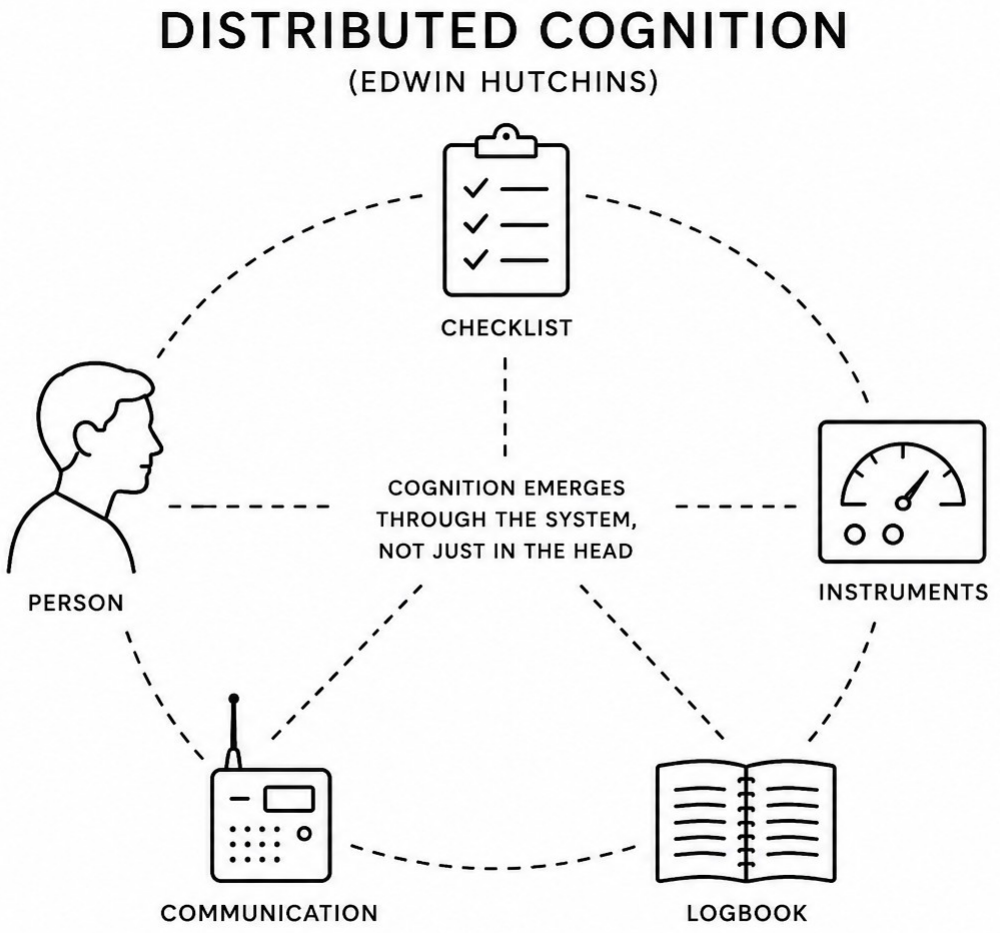
Researchers have been looking at **AI as a cognitive partner**.

- Cope and Kalantzis (2021) distinguish between what they call "didactic" pedagogy — transmission of knowledge from teacher to student — and "reflexive" pedagogy, which involves dialogue, inquiry, and meaning-making. AI, they argue, creates conditions for reflexive learning at scale for the first time.
- Luckin et al. (2016) in Intelligence Unleashed argued that AI has the potential to act as a personal learning companion — one that knows the learner, adapts to their needs, and supports their development over time. That vision is now considerably closer to reality than it was when they wrote it.

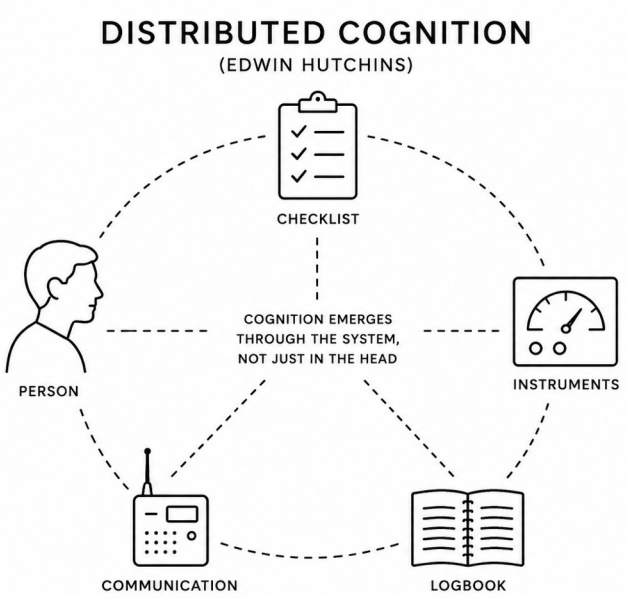
The Re-frame

The concept of distributed cognition (Edwin Hutchins 1990s), examines how **thinking is not confined to the individual but spread across tools, environments, and interactions.** Seeing cognition in this light, helps to illuminate that some cognitive processes are properties of a system of interaction, distinct from the cognitive properties of the individuals who participate in the system.

Where does learning actually reside—in the individual student, or in the system of interactions between people, tools, and environments?



The Re-frame



E-learning Example

Imagine a student taking an online biology course through an LMS such as Canvas.

The student is learning about cell walls. To complete an assignment, they:

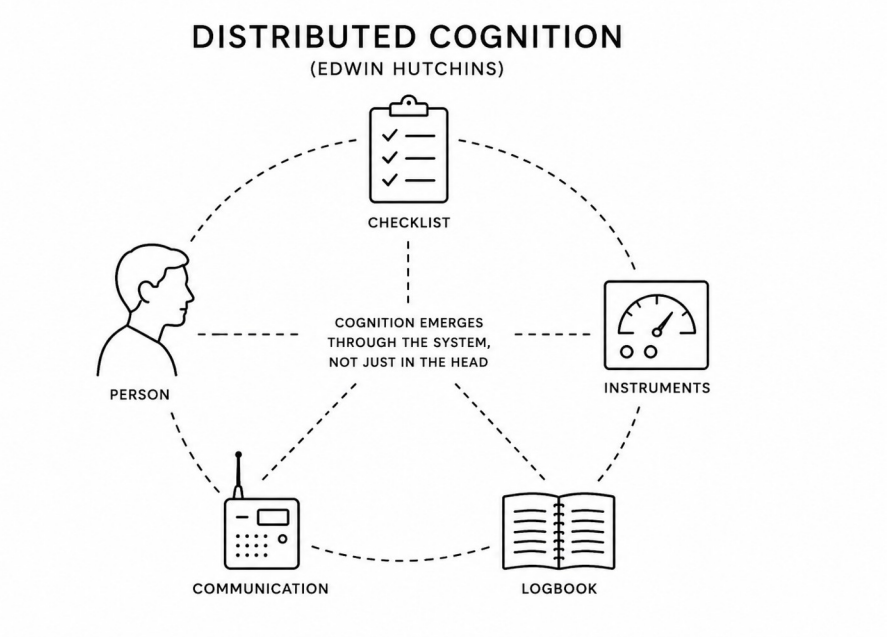
- Read lecture notes
- Watch instructional videos
- Participate in discussion forums
- Use an online simulation
- Review instructor feedback
- Consult classmates

From a traditional perspective, learning occurs primarily inside the student's head.

From a distributed cognition perspective, learning occurs across:

- The student
- The LMS
- The simulation software
- The discussion forum
- The instructor's feedback
- Interactions with peers

The Re-frame



AI Example

Now imagine a student writing a research paper.

The student:

- Develops an initial idea
- Asks ChatGPT to suggest alternative perspectives
- Uses AI to clarify difficult concepts
- Requests feedback on an outline
- Revises sections based on AI-generated critiques
- Continues refining arguments through dialogue

In this case, some cognitive functions traditionally performed internally are now shared with the AI:

- Brainstorming
- Idea generation
- Clarification
- Organization
- Reflection
- Revision

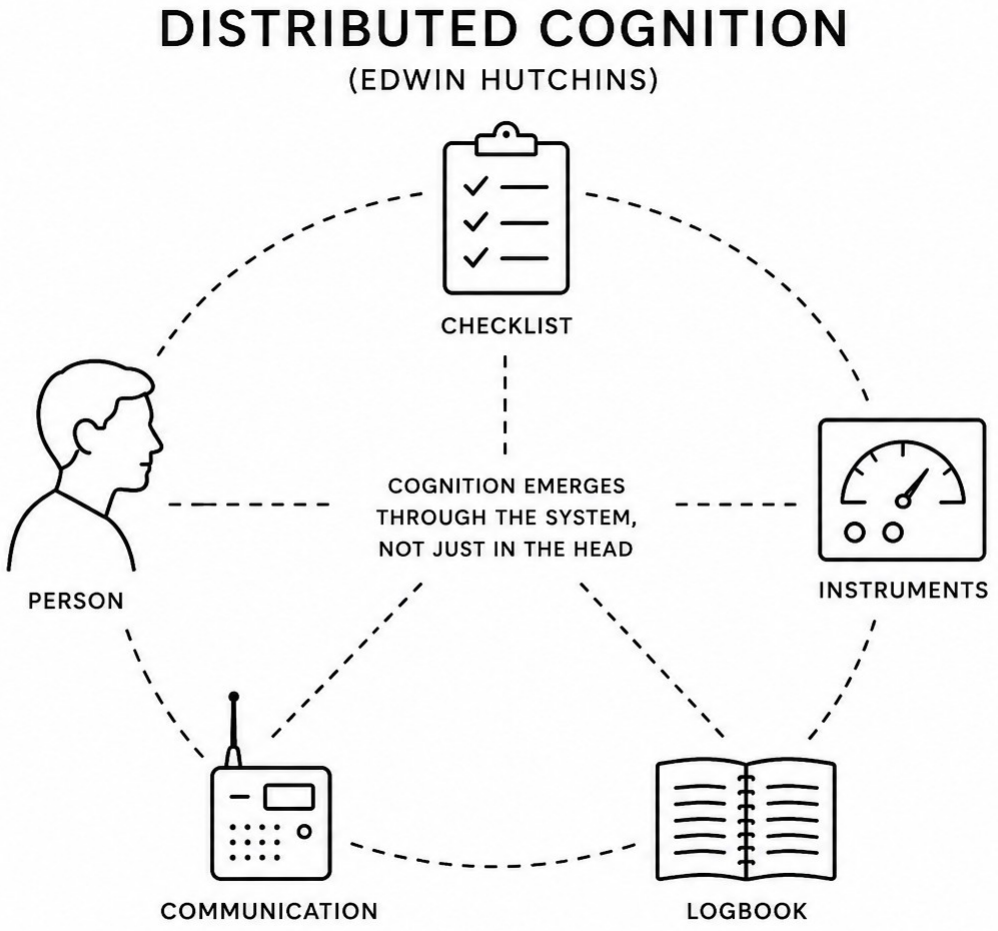
The final paper is not produced solely by the student or solely by the AI. It emerges from an ongoing interaction between them.

The Re-frame

This is why AI feels different from earlier educational technologies.

- A textbook stores information.
- A video presents information.
- An LMS organizes information.
- AI participates in the cognitive process itself through dialogue and adaptation.

Distributed cognition suggests that thinking is not confined to the individual mind but emerges through interactions among people, tools, technologies, and environments; AI extends this idea by becoming an active participant in the cognitive system rather than simply a source of information.



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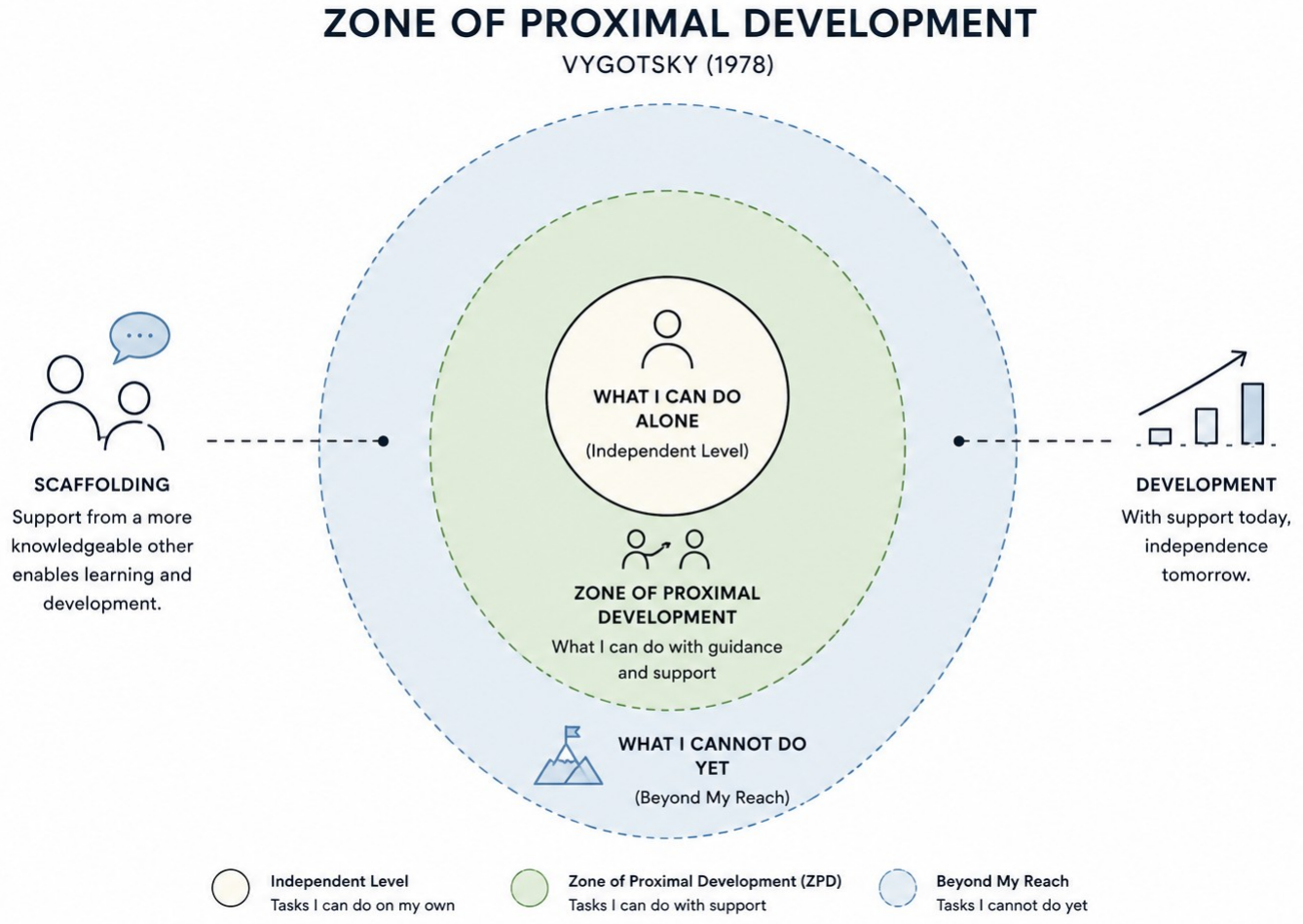
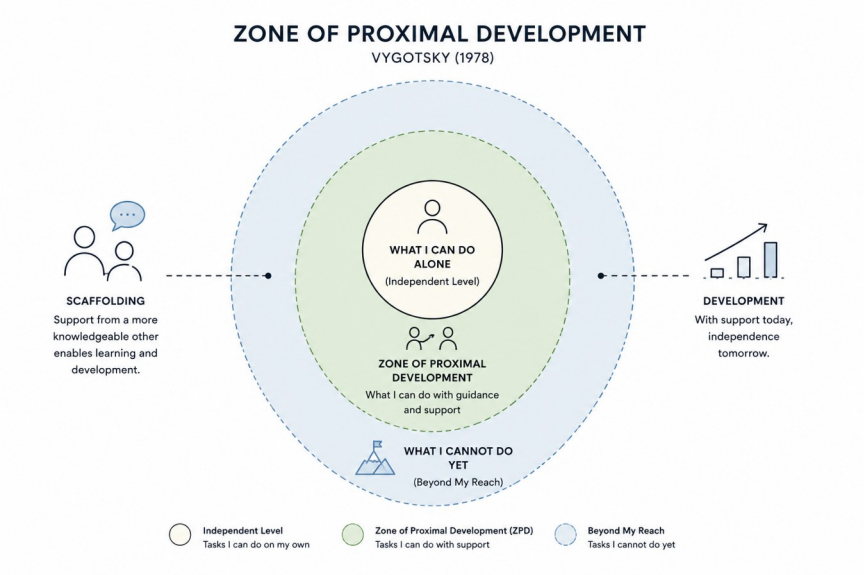

ZONE OF PROXIMAL DEVELOPMENT
VYGOTSKY (1978)
SCAFFOLDING
Support from a more knowledgeable other enables learning and development.
WHAT I CAN DO ALONE
(Independent Level)
ZONE OF PROXIMAL DEVELOPMENT
What I can do with guidance and support
WHAT I CANNOT DO YET
(Beyond My Reach)
DEVELOPMENT
With support today, independence tomorrow.
Independent Level
Tasks I can do on my own
Zone of Proximal Development (ZPD)
Tasks I can do with support
Beyond My Reach
Tasks I cannot do yet

The Re-frame



E-Learning Example

Imagine a student enrolled in an online statistics course.

The student understands basic averages and percentages but struggles with regression analysis.

Working alone, they cannot successfully complete a regression assignment.

The online course provides:

- Instructional videos
- Interactive examples
- Guided practice exercises
- Instructor feedback
- Discussion forums

These resources help the student perform tasks they could not complete independently.

Over time, the student develops enough understanding to perform regression analysis without assistance.

In this example:

- Independent understanding of averages = What I can do alone
- Regression analysis with course support = ZPD
- Advanced statistical modeling = What I cannot do yet

The e-learning environment provides the scaffolding that allows movement through the ZPD.

E-Learning Framework

EVALUATION
Online course evaluations

ETHICS
Online equity accessibility

PEDAGOGY
SAMR model

Instructional design

E-LEARNING

A student-centered approach that combines technology, support, and best practices to foster equitable and effective learning.

INSTITUTION
Aligns with University vision

TECHNOLOGY
Canvas
Video production
Microsoft Office
Google Suite

MANAGEMENT
Roles
Responsibilities
Processes

SUPPORT
Canvas
Research projects
Faculty
Students

E-Learning Framework

EVALUATION
How do we evaluate student work?

ETHICS
Concerns over academic integrity

PEDAGOGY
AI as a cognitive partner

AI-Enhanced Learning

A student-centered approach
Examines thinking about thinking
And cognition and how this relates to teaching and learning.

INSTITUTION
Institutional AI strategy

TECHNOLOGY
Generative AI tools (ChatGPT, Claude, Gemini)

AI tutoring systems

MANAGEMENT
AI governance structures

SUPPORT
Faculty AI literacy training

Student AI literacy programs

Can we get rid of some of these?

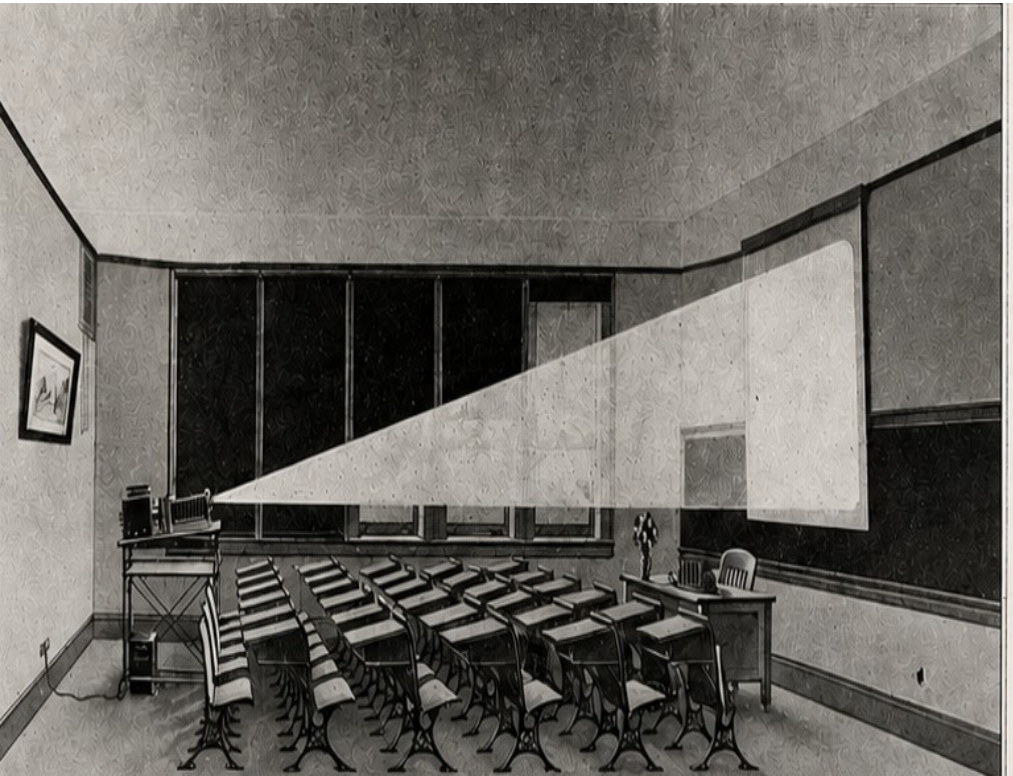
Add new components?

Which dimension concerns you most at your institution right now?

The Re-frame

For more than a century educational technology has largely been concerned with improving the delivery of learning: better films, better projectors, better computers, better networks, better learning management systems.

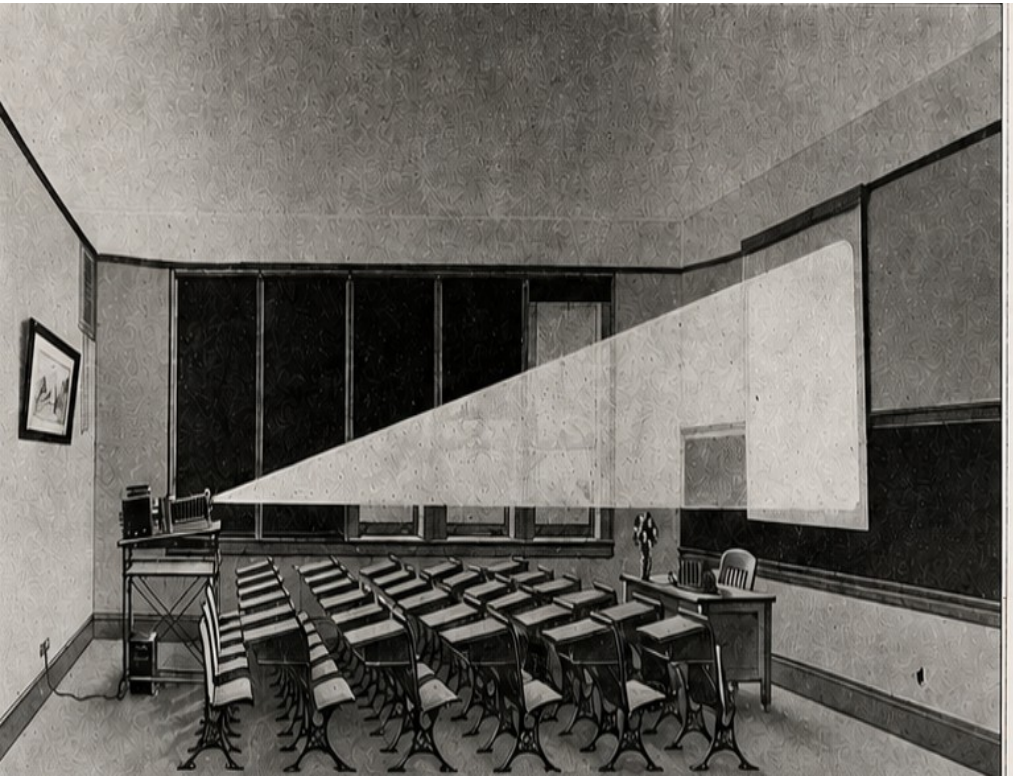
AI challenges that tradition because it does not simply deliver information—it participates in cognition itself.



The Re-frame

If students now have access to a cognitive partner through language, available at any time and almost anywhere, then the central question for universities is no longer simply, "How do we provide access to knowledge?"

The question becomes: "How do we help students think, learn, create, and act wisely in partnership with increasingly intelligent systems?"



Discussion

Can we use these lessons from the past?

Can our traditional ways of handling technology at universities still work with regards to AI implementation?

What are the questions that universities need to ask themselves at this point?

Has the fundamental role of educational technology changed, or have we simply become better at delivering information?

If AI can increasingly perform functions traditionally provided by teachers, tutors, and peers, which human roles become more important rather than less?