Designing Innovative Technology-Supported Spaces to Support Collaborative Learning

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Associate Professor of Science Education
Director, Krause Innovation Studio
The Pennsylvania State University

Dr. Scott McDonald

- Visiting Professor Martin-Luther-Universität Halle-Wittenberg

- Undergraduate Degree in Physics

- M.A. in Teaching (Physics and Mathematics)

- Physics Teacher 6 years

- M.S. in Science Education

- Ph.D. in Learning Technologies

- Professor of Science Education

- Director of Krause Innovation Studio

The Pennsylvania State University

- 24 campuses across the state

- 98,000 students across all the campuses

- ~50,000 at the University Park campus

- Land Grant University for Pennsylvania

  - Commitment to:

    - Teacher Training

    - Engineering

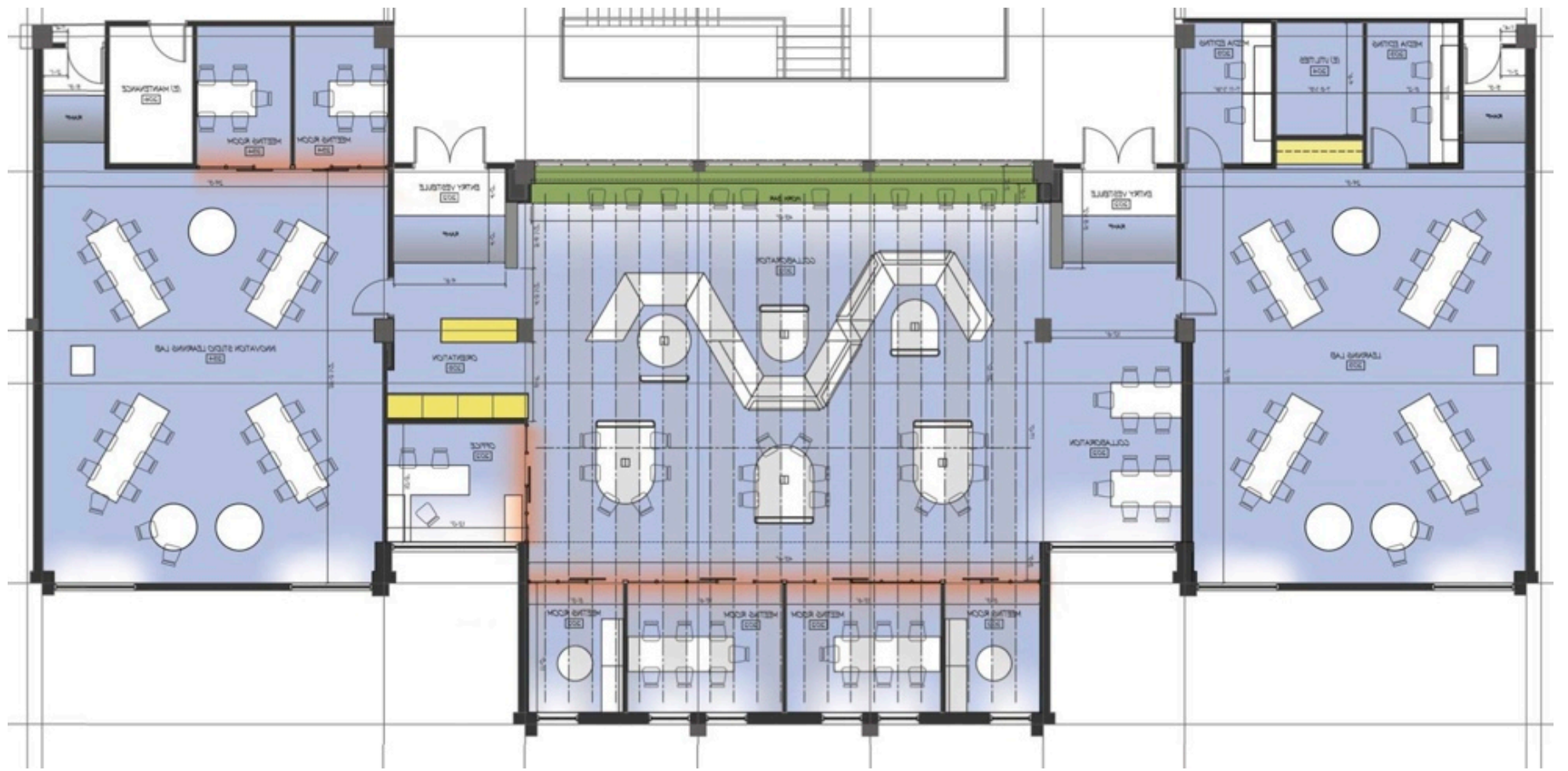   - Agriculture

The College of Education

- Teacher Education

  - Secondary and Elementary

  - Science, Mathematics, Social Studies, English

  - EDUCATE 1-to-1 notebook requirement

Krause Innovation Studio

- Designed to support EDUCATE 1-to-1

- Professional Development for Faculty

- Pedagogical Research and Development

  - Learning Spaces

  - Records of Practice

  - Digital Scholarship

MAINTENANCE

MEETING ROOM

MEETING ROOM

ENTRY VESTIBULE

ENTRY VESTIBULE

MEDIA EDITING

MEDIA EDITING

INNOVATION STUDIO LEARNING LAB

ORIENTATION

OFFICE

COLLABORATION

COLLABORATION

LEARNING LAB

MEETING ROOM

MEETING ROOM
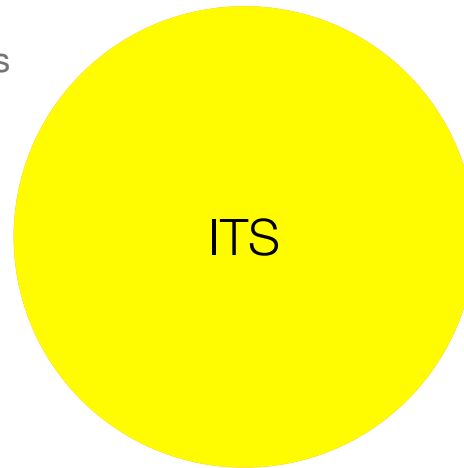
MEETING ROOM

MEETING ROOM

Learning Environment Ecosystem | Classroom and Beyond
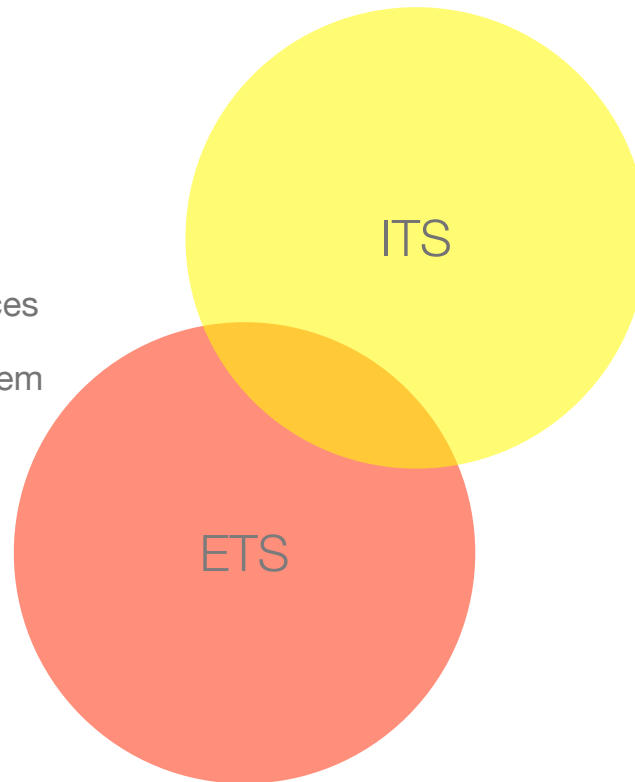
Technology and Teaching

- Information Technology Services

  - Email

  - Servers

  - Administrative
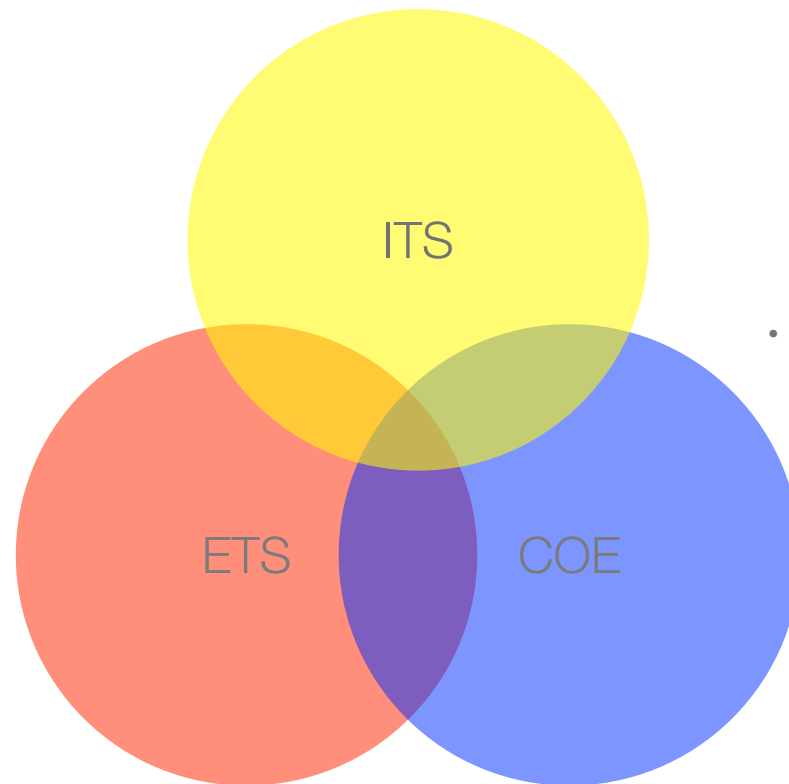
ITS

Technology and Teaching

- Educational Technology Services
  - Content Management System
  - Instructional Design
  - Social Media Platforms
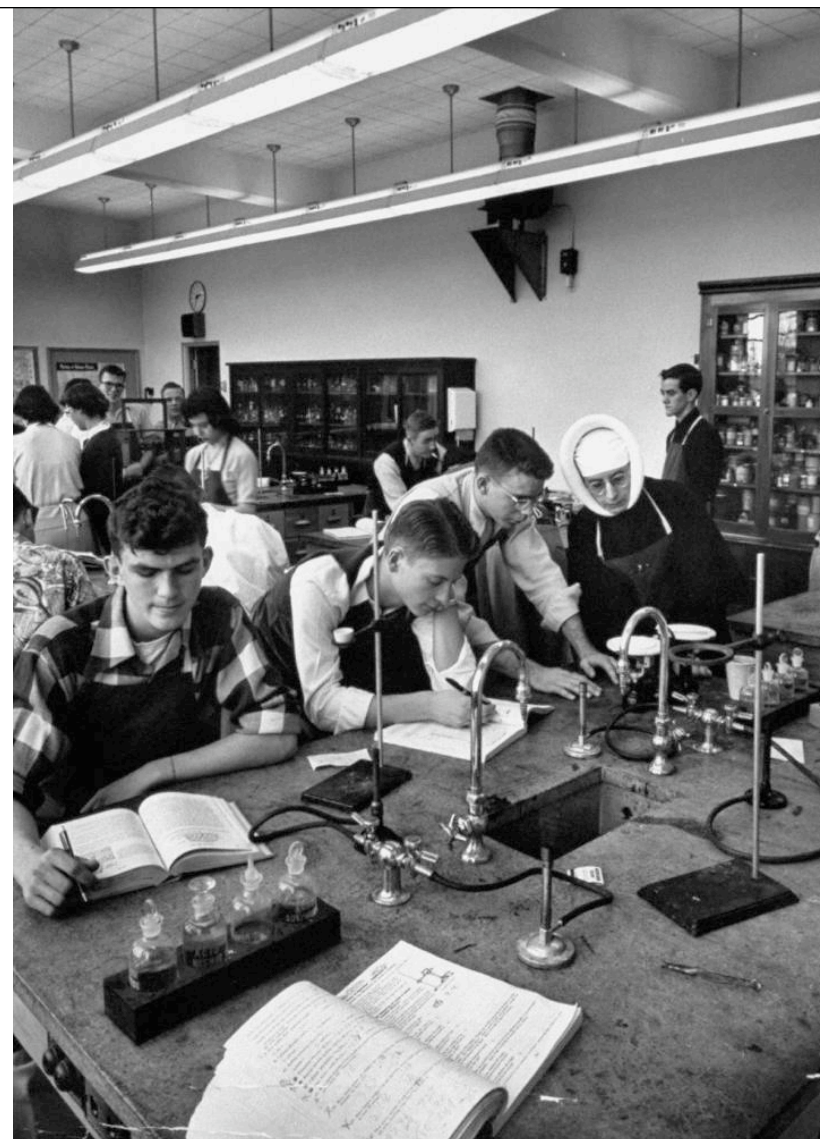   - Blogs@PSU
    - Yammer

Technology and Teaching

ITS

ETS

COE

- College of Education
  - Teaching and Learning
    - Learning Theory
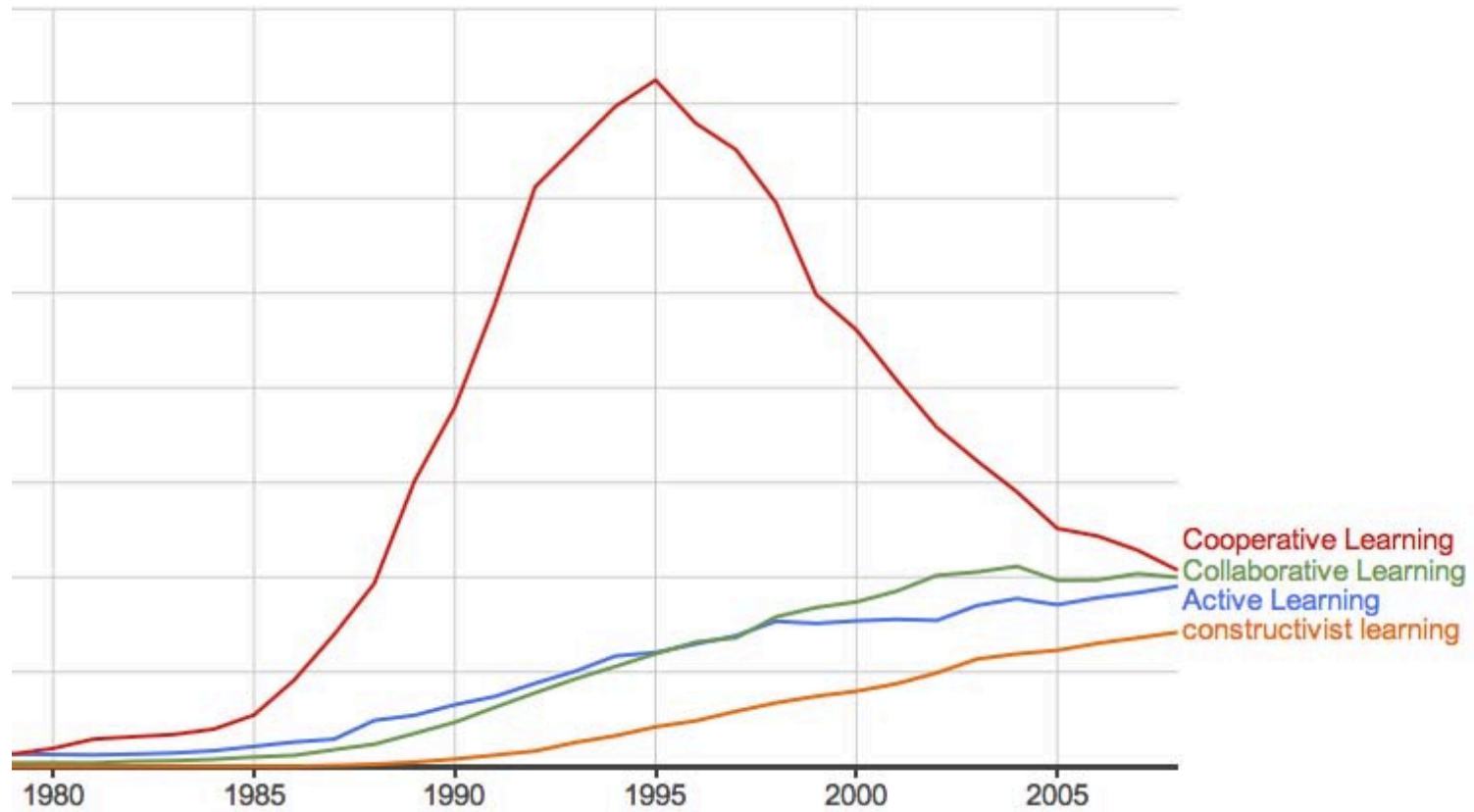   - Pedagogical Experience

Nothing is more dangerous than an idea, when you have only one idea.

Teaching First, Technology Second

- Learning spaces (and environments) designed with learning theory in mind

- Problems of Practice

- Problems of teaching/learning

  - I want my students to be exposed to, analyze and synthesize multiple ideas

- NOT problems of technology implementation

  - I want my students to use blogs/MOOCs/ Voicethread/Games in my class
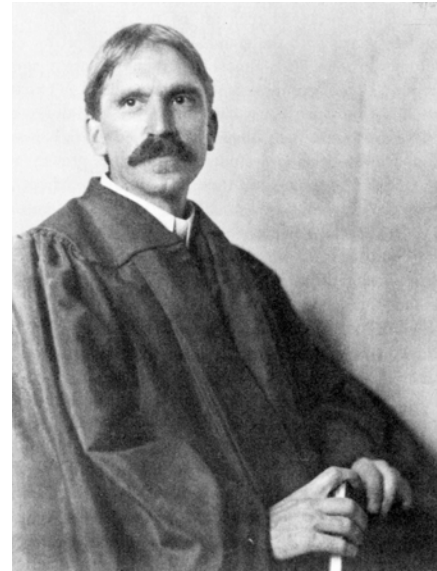
The Rise of "Active" Learning

Google ngram viewer

What does "active" mean?

- Student-centered

- "Active involvement"

- "People actually move in the classroom"

- Not passive/teacher centered

- Not bored or distracted or asleep

- Not using the digital devices (inappropriately)

- Engagement

Intellectual Engagement

- Dewey

    - Perplexity

    - Don't understand, but want to understand

- Vygotsky

    - Interpersonal to intrapersonal

    - Mediating tools/signs

        - Neutral objects

        - Create meaning with others

Can people easily see each other?

Sight lines, Swivel chairs, Decentered

Can people easily see each other? Screens, Podium, Table Orientation

Can people easily see each other?

Screens, Podium, Table Orientation

Can people easily see each other?   Screens, Podium, Table Orientation

Can people share their work?

Plug and Play, Huddleboards, Wireless

Can people use their own tools?   BYOD (Bring Your Own Device)

- More transparent

- Learn to use own tools

- Support - less technical, more pedagogical

- Less cost

  - No life cycle

  - Less overhead

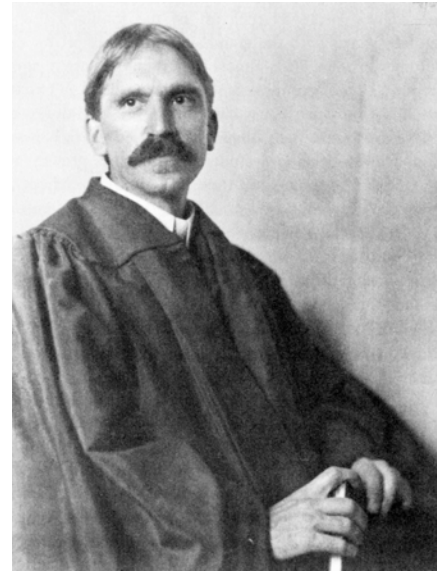# Can people use their own tools? | BYOD (Bring Your Own Device)

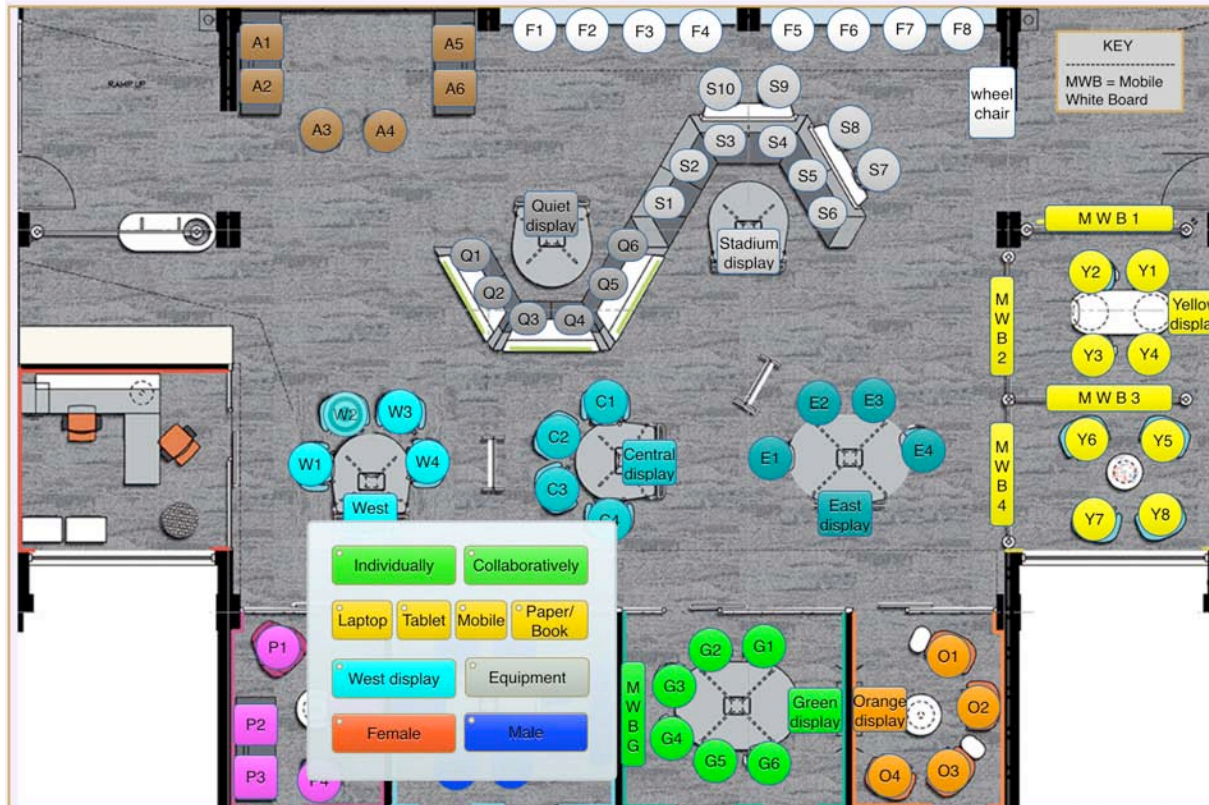Is the space arranged for different uses? | Diverse Space

Intellectual Engagement

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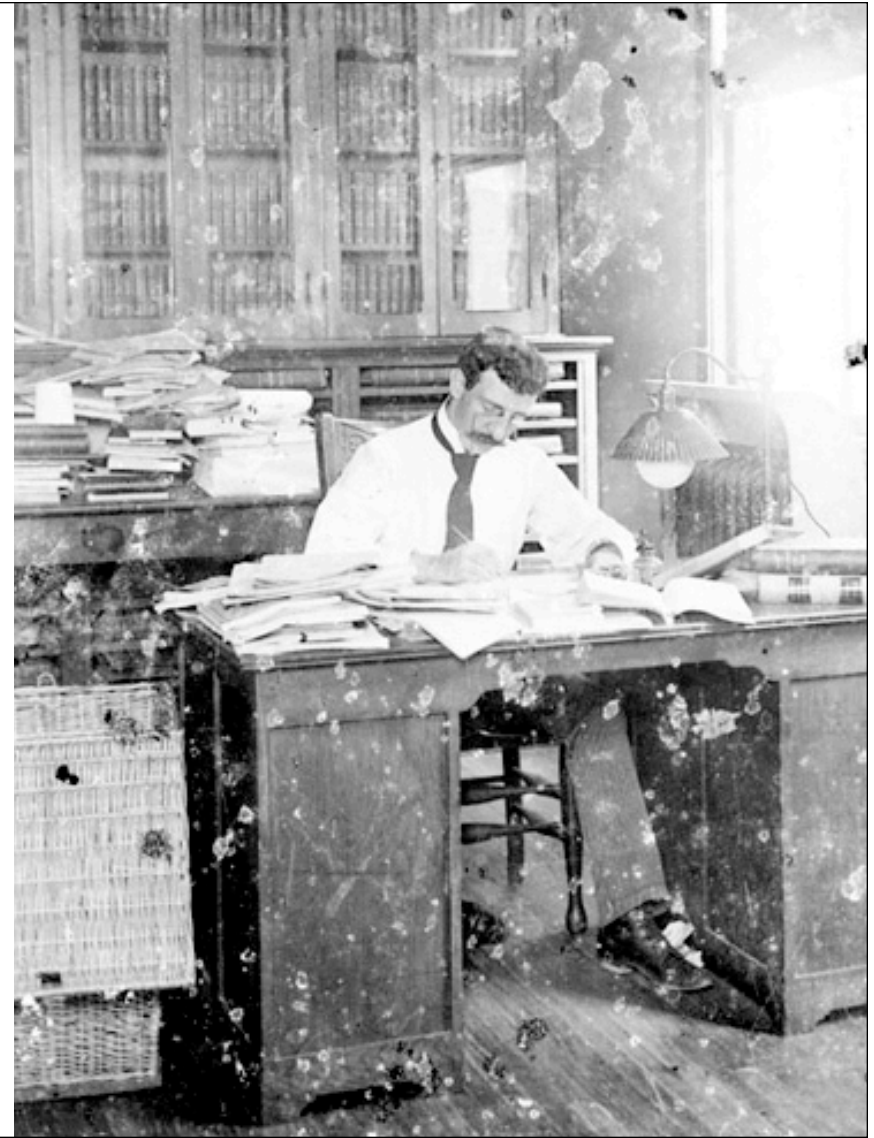# Intellectual Engagement

- Dewey

  - Perplexity

  - Don't understand, but want to understand

- Vygotsky

  - Interpersonal to intrapersonal

  - Mediating tools/signs

    - Neutral objects

    - Create meaning with others

- Multiple ways to engage with other students' ideas

  - Site lines, swivel chairs, decentered

  - Plug and play, Huddleboards, Wireless

- Multiple tools in the environment

  - Whiteboards/Huddleboards

  - BYOD

    - Students own devices
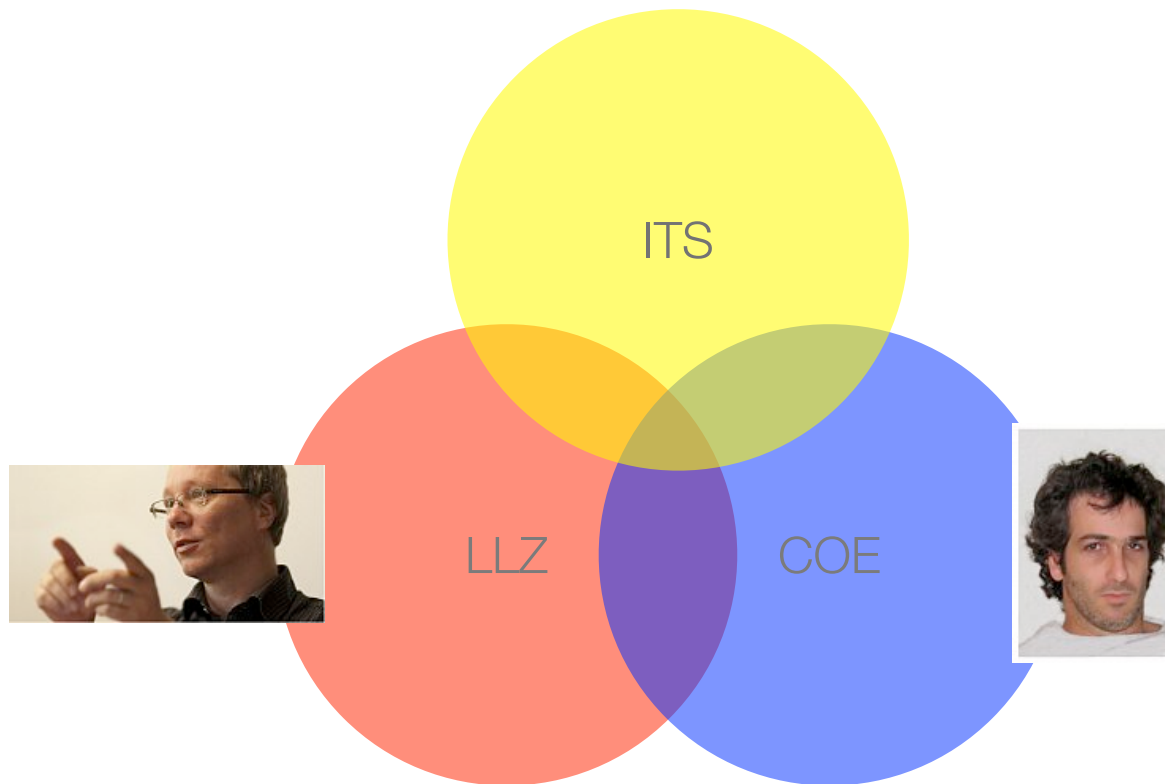
- Multiple uses for the space

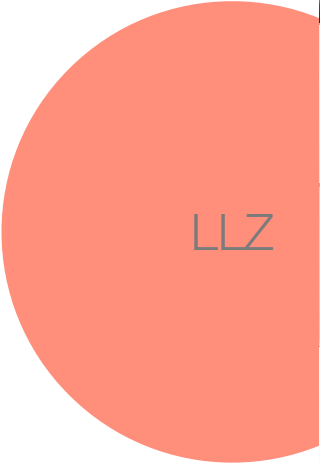How do you know that your space works? | Learning Spaces Data

If you don't like change, you're going to like irrelevance even less.

Working with Faculty

Project "Hot" Teams

LLZ

COE

Project "Hot" Teams

Project "Hot" Teams

- Clearly articulated project
  - Teaching and learning goal
  - Technology goal
  - Research goal

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Questions and Conversation