

# **HS 525: Cognitive, Sociocultural and Critical Foundations of the Learning Sciences**

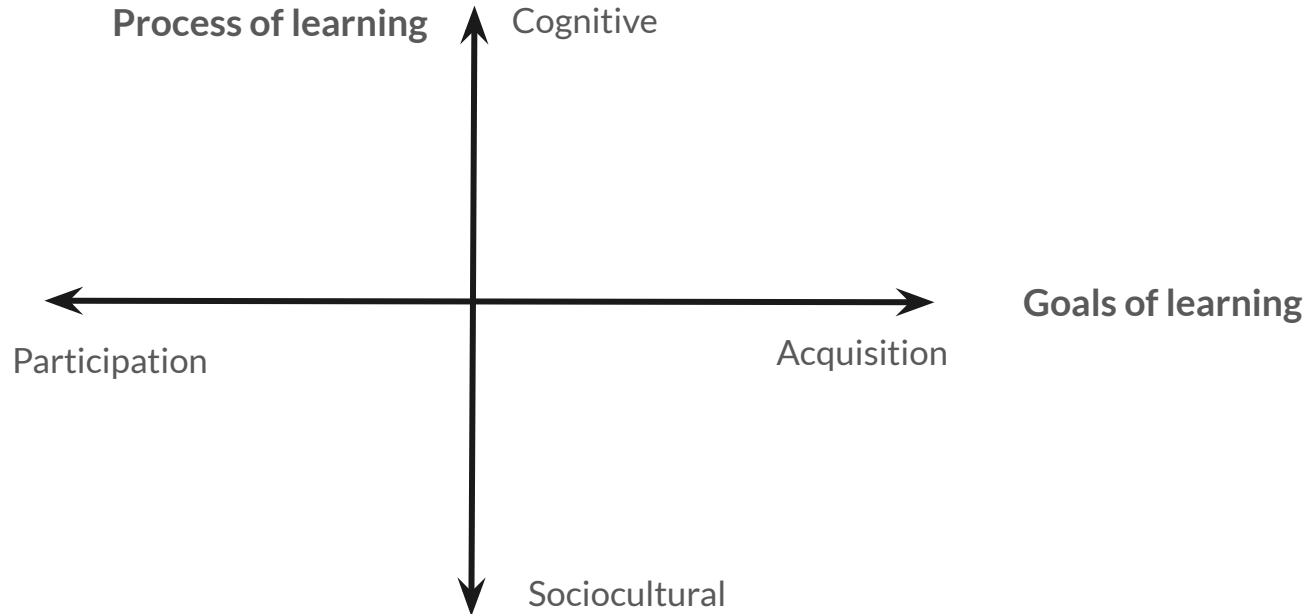
Lectures 4, 5: August 14 & 19, 2024  
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## What is challenging from last week?

- It questions your understanding of knowledge and learning
- Justify that something is either acquisition or participation
  - No discussion, preset material, justify that you have acquired, no personal inputs
  - Some participation, but within the education system
    - Participation in a different kind of system
    - No participation -
      - Taking exams cannot be an end in itself - can taking an exam be an identity?
        - Exam-taker as identity?

# Acquisition-Participation vs cognitive-sociocultural





# Data collection and Research Methods

- Experimental comparisons -> Claims about causal relationships
- Tests and surveys
- Statistical tests for comparison
- Lack ecological validity -> ignore interactions between individuals and environments and don't account for emergence
- Qualitative methods -> interaction analysis, interviewing, ethnography
- Variables are dynamic and locally produced
- Analyse tools, classroom practices, language, team dynamics
- Local learning theories
- Theoretical concepts are not clearly defined apriori



# Educational Design

- Use a specific model of cognition -> Expert cognitive model for the specific concept or area
- Help students build target normative knowledge structures -> address misconceptions
- Cognitive tutors -> Continually update student model as they do tasks
- Focus on activity systems -> support authentic practices and environments
- What does it mean for a practice to be authentic? For whom?



## Synergies/ “Living with contradictions”

- *“Because **no two students have the same needs and no two teachers arrive at their best performance in the same way**, theoretical exclusivity and didactic single-mindedness can be trusted to make even the best of educational ideas fail.”*
- *“When two metaphors compete for attention and **incessantly screen each other for possible weaknesses**, there is a much better chance for producing a **critical theory of learning** (Geuss, 1981; Habermas, 1972). Such a theory would inquire after the **true interests of all of the parties** involved in the learning process and thus engage the research community in an endeavor likely to have a **liberating and consolidating effect** on those who learn and those who teach.”*
- Not differing opinions, but “*different, mutually complementing discourses*”. **Choice depends on what you want to achieve**
- **Methods:** Support both experimental, apriori contrasts and analyse emergent, interactional processes
- **Design:** Use the structure of human mental representations, recognize that this is only part of what impacts learning and activity
  - Subject matter?
- Be satisfied with local sense-making.

## Pairs: (5 min)

*A group of 12-year old girls start working in a makerspace in their school because they are interested in fashion and love making costumes for the school plays and dance performances. When they began they believed they couldn't do science and so they chose an e-textiles project, instead of robotics or STEM lab. They began without knowing what e-textiles were and at the end of a year they know how to design and program an appropriate circuit to make the textiles glow, flash or anything they can imagine! They now think electrical engineering is fun.*

**Which metaphor best describes various instances of learning in this situation and how?**

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<https://padlet.com/sameerss/a-group-of-12-year-old-girls-start-working-in-a-makerspace-i-5n68dlry4ly6qn54>



### Share your answers and explanations:

- 1) Acquisition -> carried over to participation
- 2) Couldn't acquire -> participated in something else
- 3) Talking to each other, working in makerspace, instructors are guiding, peripheral participation, reading manuals and building - getting full view; transfer also happened with new circuits
- 4) They already had a community
- 5) Fiddling or tinkering with some "information"

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**REFLECTION SPOT (INDIVIDUAL, 2 min) <SKIP>**

*You are starting to work in a school in a community of artisans. The school has very low attendance and poor infrastructure. Most of the people in the community have not gone to school beyond class 5, but are literate (reading and writing) in the local language. The children would like to study in order to understand the changing world around them which includes new technologies and new ways of life, but they don't know where to start.*

**Which metaphor of learning would be your primary guide when redesigning the classroom in such a school? Why?**

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