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

Lectures 4, 5: August 14 & 19, 2024

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Video time!

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Pairs (5 min): What were the key differences you observed between learning in the two scenarios?

https://docs.google.com/document/d/1NRML9_Nu1FziKXu9K-cgV-h2qRmblQ6ujGa8wwiyGpw/edit?tab=t.0

Goals of learning

ACQUISITION METAPHOR

- Individual increase or improvement or **ownership of knowledge**
  - Concepts as basic units of knowledge
  - Accumulated, gradually refined and combined
  - Richer cognitive structures

PARTICIPATION METAPHOR

- Participation in the activities of a community - doing
- Community building

Transfer

ACQUISITION METAPHOR

- Using knowledge in a new context
- Near vs Far transfer
- Representation of knowledge should be sufficiently abstract to be transferred

  (concepts + processes) -> Networks of knowledge

PARTICIPATION METAPHOR

- Greeno: learning as "improved participation in interactive systems" -> "transfer in terms of transformations of constraints, affordances and attunements"
- Account for actors prior experience
- The situationally invariant part of the learner that goes from one situation to next

Process: Knowing/learning

COGNITIVE THEORIES

1. **Knowledge:** Representation of information in the mind -> property of an individual, ownership
2. **Cognition:** Manipulation, transformation and retrieval of representations
3. Distinctions based on how knowledge is represented and transformed
4. **Learning:** Changes in the representations in the brain; acquiring new knowledge
   a. **Passive:** Lecture, Reading, Watching a video, Seeing worked examples
   b. **Active:** Construction of representations using inquiry, problem-solving, discovery
5. **Assessment:** Knowledge is assessed using observable behaviours predicted by the model

SOCIOCULTURAL THEORIES

1. **Becoming a participant**
2. **Intertwining** of knowledge and the process of generating knowledge - > **Knowledge** is an aspect of activity and discourse
3. **Inseparability** of person and context -> Language, tools, social and cultural histories
4. Knowing emerges through the activity of the individual in a context/situation -> "joint accomplishment", "evolving bonds between individual and others"

Role of Teacher and Student

COGNITIVE THEORIES
- **Teacher:** provider, facilitator, mediator
- **Student:** recipient or constructor
- **Motivation** as an individual, stable trait independent of contexts
- **Key focus:** how do individuals learning concepts
- **Identity**: signified by "possession" of knowledge

SOCIOCULTURAL THEORIES
- **Teacher:** Preserver of continuity of practice/discourse, expert participant
- **Student:** peripheral participant, apprentice
- People act in **motivated or unmotivated** ways depending on the practices of the context -> activities can be designed to frame participation such that people act in motivated ways
- **Key focus:** social environment that supports/ inhibits engagement with disciplinary practices
- **Identity**: Being or becoming a part of something greater (a community)

Acquisition-Participation vs cognitive-sociocultural
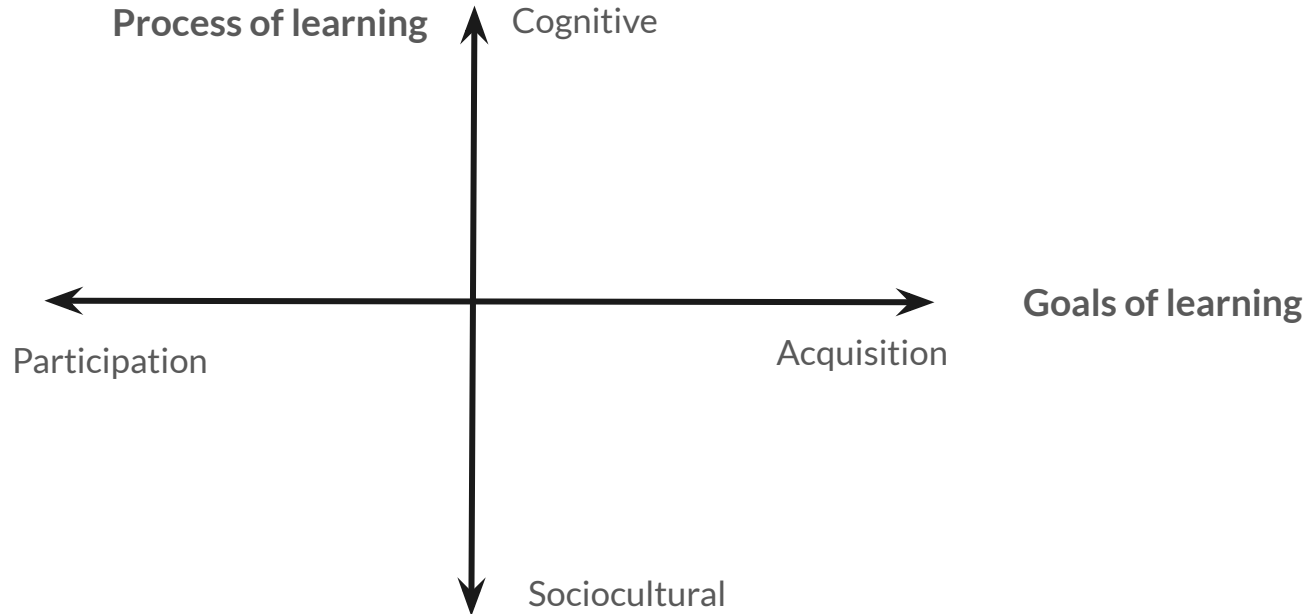
Pairs: (5 min)
A professor assigns an open-book exam where students are allowed 12 hours to work on the exam using any resources including their notes, textbooks, the internet, peer discussion and genAI. Assume the problems are open-ended.

Is learning entirely explained by one metaphor? Why or why not? Is acquisition a base for participation? How would you synergize the cognitive and sociocultural theories to explain the learning mechanisms underlying such an assignment?

Share your mechanisms:
1) Cannot be explained by one metaphor => peer discussion suggests participation metaphor
2) Learner playing an active role in constructing knowledge - acquisition
3) Peers and genAI as tools for acquisition, participation may not be happening at all
4) Yes, to an extend, acquisition is the base for participation - pen and gravity
   a) Knowledge as a means to the end for participation
5) The 2 metaphors have different starting points - different meanings for when learning has happened, not different mech
   a) Knowledge comes along "for the ride"
6) Foundation of numbers - participation in kitchen - embedded in practice
7) Acquisitionist don't care about knowledge is an extreme position
8) Acqusition and practice cyle
9) Knowledge becomes a lens to shape practice
10) Theories and knowledge are a part of of the community of scientists
11) Participation -> Acquisition -> Participation is primary
12) Dancer with no legs - can they participate?