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

Lecture 1: August 5, 2025

Aditi Kothiyal

About this course

- Instructor: Aditi Kothiyal (AB11/310A)
- Google Classroom: s75w7yev
- TA: Raina Jain (PhD student in HSS)
- Office Hours: After class or by appointment
- Course slots: D1,D2 (7/206)

Course Structure

- Weekly readings - 1 or 2, perhaps a video, assigned Fri for following Thu (except first week, assigned today)
  - Submit reflection assignment by **Thursday 10am**
  - **Complete at least 10/14 memos for a 25% grade (scaled according to completion)**
  - Week specific prompts will be provided on Moodle
    - Memo, meme, reel, concept map etc
- Each class: short lecture but many
  - Activities - individual and collaborative
  - Discussions - your critique and questions about the readings
  - **Participate in at least 80% of the classes for a 25% grade (scaled according to participation)**

Assessments

- Exam 1- 25% grade (during exam 1 period)
- Exam 2 - 25% grade (during exam 2 period)
- The exact format and portion will be announced a couple of weeks before the exam

Textbooks

1. [CHLS] Sawyer, R. K. (Ed.). (2014). *The Cambridge handbook of the learning sciences, 2nd edition*. Cambridge University Press. - In the library
2. [IHLS] Fischer, F., Hmelo-Silver, C. E., Goldman, S. R., & Reimann, P. (Eds.). (2018). *International handbook of the learning sciences*. New York, NY: Routledge. - In procurement
3. [HCFL] Nasir, N. I. S., Lee, C. D., Pea, R., & McKinney de Royston, M. (2020). *Handbook of the cultural foundations of learning*. Taylor & Francis - In procurement

Norms of the class

- This is a participation-based community of learners - no question stupid, no comment silly.
  - Every piece of participation will be noted by the teaching team.
  - Any language welcome, as long as someone can translate
    - Understand: English, Hindi, Bengali, Tamil, Marathi and a little Malayalam
- We respect each other's time and efforts - listen when others speak, keep your comments brief to allow others to speak

Norms of the class

- We can disagree without being disagreeable - critique ideas not people
  - Say “I don’t agree with the point …” instead of “I don’t agree with her/him/them …”
  - “I agree with part of what you said, but I’d like to add …”
  - Don’t say “Well that’s just a stupid idea…
- Be analytical in your critique - say why you agree or don’t with something
  - Suggest refinements to others arguments if possible
- Instructor is also learning - will take any questions, but doesn’t promise answers

Generative AI policy

- An AI tool that can generate language and produce coherent responses to your queries
- Uses existing data on the Internet to make connections and produce words that have more likelihood of following each other
- Hallucinates - ie, makes random connections
- Can provide different responses to same query
- Useful for generating ideas, but lacks a “voice” in the writing

Rules for using genAI in this course

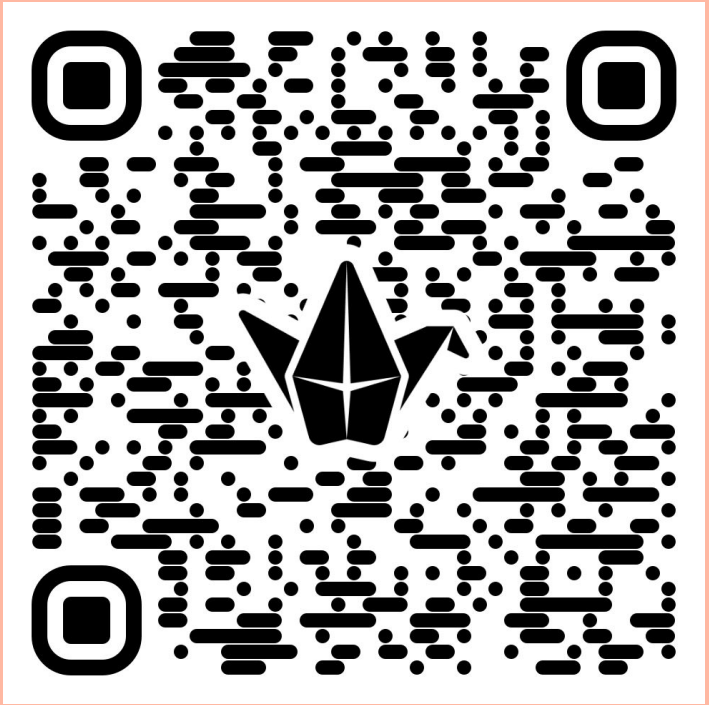
1. You are encouraged to use generative AI in your submissions without penalty, however:
2. **[HONOR CODE]** You must declare whether or not you used any generative AI in your assignment
3. If yes, you must say **how and submit your entire conversation with the tool** with your assignment
4. If you do not, I will still know that you used the tool and will penalize you or make you repeat the assignment

A little bit about me

- An electrical engineer by training, switched to Educational Technology and Learning Sciences during PhD, Assistant teaching professor affiliated with HSS
- My work:
  - How people learn when they make things and solve real-world problems
  - How can we design learning environments that help them learn better
- I like to bake and write poetry
- I am teaching this course because I want to have rich discussions about the Learning Sciences in the light of new technologies permeating education
- I hope that at the end of this course I will have motivated at least a few of you to want to research learning

A little bit about you

What are the different “things” you learn? Think broadly, everything from differential equations to cooking to controlling your emotions is acceptable. (individual, 3 mins)



Why are these things important to you to learn? Justify to your partner. (pair, 5 mins)

Share why and what you learn

What?

To regulate emotions
Interact with difficult people
Dancing
Swimming
Photography
Reading sonnets
How to be social
Yoga
Language

Why?

1) Passionate
2) To acquire a skill
3) Curiosity
4) To survive/necessity
5) To feel good
6) To find yourself
7) Societal acceptance
8) Ritualistic/repetitive

How do you know you have learned what you mentioned before? (Individual, 3 min)

What was the process by which you learned these things? (Pair, 5 min)

Share why and what you learn

How do you know?

External validation/certification
Being able to do things better
Comparing with your own prior abilities
Outcome of the “doing”
Being able to apply in different situations
Muscle memory
How I look at myself/feel about myself

Process of learning

Trial and error
Pattern recognition
Following a role model
Continuous practice
Social conditioning
Self-critique/feedback from self/challenging yourself
Un-learning and re-learning
Consequences based
Divide and conquer - transfer learning?
Observation - >mimicry/imitation
Experience and self-reflection
Asking questions

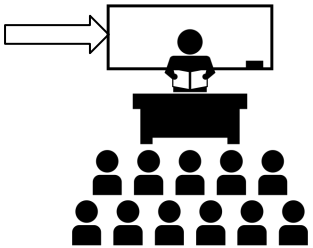
What are the Learning Sciences?

Cognitive science

Anthropology

Sociology

Education



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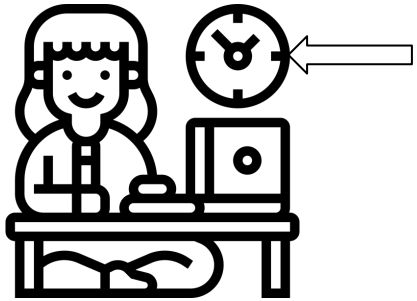
from Noun Project



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Educational Psychology

Computer science

Information science

Design studies

Cognitive, sociocultural and critical processes underlying effective learning

Design learning environments for effective learning

Key Foci of the Learning Sciences

- Response to “Instructivism” - facts, procedures
- Study of children’s learning and how experts work in the real world
    - importance of deep conceptual understanding that can be applied in new situations + practices => redefining goals of education
- Focus on learning, not just teaching - *how* people learn, ie, processes of learning
    - Transition from novice to expert
    - Building on prior knowledge
    - Concrete to abstract
    - Support learning
    - Externalization and articulation
    - Reflection
- Educational technology
- Create learning environments for authentic practices - design science

Next class

- *Foundations and History of the LS.*

Readings:

1. Introduction: Evolution of Research in the Learning Sciences - Chapter 1, IHLS
2. A Short History of the Learning Sciences - Chapter 2, IHLS

Optional:

- Foundations of the learning sciences - Chapter 2, CHLS

Uploaded on Google Classroom