

Educational Psychology

Introduction to Learning Sciences II

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| Course Info | <p>Instructor: <PROF_FIRST_NAME> <PROF_LAST_NAME>, Ed Sciences 1086; <PROF_EMAIL> (office hours by appointment)</p> <p>Credits: 3</p> <p>Canvas: <LINK_CANVAS></p> <p>Instructional mode: Face-to-face</p> <p>Classroom: Ed Sci 304</p> |
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| Course Overview | <p>This is the second of a two-semester course sequence that establishes the intellectual foundations for research in the learning sciences. In 795, we got to know major theoretical perspectives that are foundational for the learning sciences. In 796, we will look at how these theoretical perspectives have shaped interventions designed to help students learn, and what methods we can use to analyze learning processes to better understand by which mechanisms such interventions enhance learning.</p> <p>We will revisit foundational theoretical perspectives by discussing theoretical models that are more “applied” because they seek to explain how learning happens and suggest ways in which we can enhance learning. For each theoretical model, we will discuss example interventions that implement theoretical models of learning. The interventions we will discuss are only examples of many other possible interventions that use variants of the same theoretical model. Moreover, the interventions we will discuss tend to combine multiple theoretical perspectives. Therefore, we will discuss which additional theoretical models these interventions draw on and which theoretical perspectives might be useful to analyze how they foster learning.</p> <p>For each theoretical model, we will also discuss an example research method that is used to study learning processes fostered by interventions that make use of this theoretical model. Again, each research method that we will discuss is only an example of many other possible methods that can be used to study learning processes based on a particular theoretical model. Likewise, the same method can be used to study learning using a different theoretical lens. Therefore, we will discuss alternative research methods that can be used to study learning processes fostered by different interventions using different theoretical lenses.</p> |
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| Expectations | <p>If you are enrolled in this course for credit you are expected to complete all of the required readings, postings, class presentations, major and minor assignments, as well as attend and participate in each class. Absences require a notification, preferably by e-mail, prior to class. Late assignments must be discussed with the instructor before they are due.</p> |
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Explanation of Credits

The credit standard for this course is met by an expectation of a total of 135 hours of student engagement with the courses learning activities (45 hours per credit), which include regularly scheduled instructor-student meeting times as specified in the course schedule below, reading, writing, and other student work as described in the syllabus.

Required Preparation Materials

All readings and videos for the course are listed in this document. Dates for completing reading assignments are listed in the Class Schedule, attached. These plans are not set in stone and may be changed if circumstances warrant. For your convenience, articles may be downloaded from the Canvas Course Site.

Class Participation in Discussions

Each week, you should prepare one question you would like to discuss in class. In addition, you

should come to class prepared to participate in class discussions. You should study each reading and be able to share critical analyses in class. While we can expect a healthy debate on some issues, you must demonstrate respect for others with whom you disagree. We also ask that you monitor your own level of class contribution and allow space for others to contribute to the class discourse. We will actively monitor this as well and may ask those who tend to speak often to refrain from dominating and allow others to contribute.

File Formats for Assignments

All assignments are due in **PDF format** by email to <PROF_EMAIL>. Use the ISLC style template that is provided in the Capstone Assignment Information folder on Canvas. Adhere to the 8-page limit for the final deliverable. For all specifications not included in the style template, refer to the APA style manual: <http://www.apastyle.org/manual/>

Assignments Extensions

For all assignments, you need to negotiate with the instructor **at least 48h prior to** the due date if you need an extension due to unforeseeable circumstances. **Late submissions will be penalized by grade deduction.**

Weekly Assignments

Summary and discussion questions

By Tuesdays, 11:59pm, you have to post a brief summary of the required resources (250 words max), plus a discussion question (100 words max) about the required readings of the given week. The summary should describe your own take-away from the reading. The discussion question should suggest interesting points of discussion; it should not be a factual question. For example, discussion questions may ask about how one of the readings relates to something you have read before in class or outside of class, it may propose examples from your own experiences in the world for topics discussed in the readings, it may ask about differences in viewpoints expressed by the readings, among others.

Capstone Project

The capstone assignment will be a pilot study for a coherent empirical research study. The study should combine at least two complementary theoretical perspectives. It should propose to test an intervention on learning outcomes and learning processes. To test the intervention, the study should use a multi-methods approach in that it combines methods that use a different unit of analysis to gain complementary insights into the mechanisms through which the intervention affects learning. The study can build on the projects from 795, but it does not have to.

The deliverables will be done individually. However, one week prior to the deadline for each deliverable, you will share your write-up with a partner from whom you will receive feedback. You are encouraged to implement the feedback in your assignment prior to submission.

The final deliverable will be a paper in the format used for the ISLS conferences. Use the ISLS style template that is provided in the Capstone Assignment Information folder on Canvas and adhere to the 8-page limit, including tables, figures, and references.

1. Abstract, Introduction, and Literature Review (2-3 pages)

The introduction of the proposal should describe which theoretical perspectives you chose to focus on, how they complement one another, and what open research questions follow from combining these theoretical perspectives. Specific assignment details and grading rubric can be found in the Capstone Assignment Information folder on Canvas. Deadlines can be found in the course schedule below.

2. Methods (1-2 pages)

In the methods section, you will describe the study design, instructional and assessment materials, as well as planned analyses for the proposed study. Update the Abstract based on your more concrete plans for the methods. Specific assignment details and grading rubric can be found in the Capstone Assignment Information folder on Canvas. Deadlines can be found in the course schedule below.

3. Results and Discussion (2-3 pages)

The results section should describe results from a pilot study and anticipated results from a proposed full study. The discussion section should describe the (actual or anticipated) contributions, detailing why they are of theoretical relevance (i.e., yield novel knowledge about how people learn) and of

practical relevance (i.e., allow us to better educate learners). Specific assignment details and grading rubric can be found in the Capstone Assignment Information folder on Canvas. Deadlines can be found in the course schedule below.

4. Final Write-Up (max. 8 pages) and Presentation (10 minutes + 2 minutes for questions)

You will present the final version of your research project in a write-up and in class. Integrate the feedback you received on previous capstone deliverables. Specific assignment details and grading rubric can be found in the Capstone Assignment Information folder on Canvas. Deadlines can be found in the course schedule below.

Grading

A detailed rubric will be posted on Canvas. Course grades will be based on student performance in the following areas:

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| Participation in class discussion: | 10% |
| Participation in class activities: | 10% |
| Summary / discussion questions: | 12% |
| Deliverable 1 paper: | 15% |
| Deliverable 2 paper: | 10% |
| Deliverable 3 paper: | 15% |
| Final deliverable paper: | 20% |
| Final presentation: | 8% |

Policies and Resources

Special Arrangements

Students bring to the classroom a variety of interests, backgrounds, learning strategies, and learning needs. If there are ways that the instructor can facilitate learning for you, particularly in relation to evaluation procedures, please alert me to them and I will try to accommodate your special needs. You can also contact the McBurney Disability Resource Center to learn about services available to students: <http://www.mcburney.wisc.edu>. If you need accommodations for instruction, assignments, or assessments in this course please let me know as soon as possible so that U can make arrangements to facilitate your participation in the course.

Religious Reasonable Accommodation

Every effort shall be made to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance, provided advance notification of the conflict is given. Whenever possible, students should notify the instructor during the first two weeks of the semester to request special accommodation.

Respectful Learning Environment

Courses in Educational Psychology are venues for the free, open, and respectful exchange of ideas. Class members are expected to respect others' backgrounds and to contribute to a healthy learning environment in all course activities. Concerns in this regard should be brought to the attention of the course instructor.

Graduate Minor in Educational Psychology

For graduate students outside of Educational Psychology, this course could count toward requirements for a Graduate Minor in Educational Psychology. For details on this program, speak to the course instructor or see details at: <https://edpsych.education.wisc.edu/academics/graduate-minor-in-educational-psychology>

Please note: For this program, students must have a Minor Advisor (faculty member in Educational Psychology) and must have their program approved before they complete more than half the courses that are part of the minor.

Learning Goals

The Department of Educational Psychology provides Ph.D. level training in four program areas: Human Development, Learning Sciences, Quantitative Methods, and School Psychology. Each student's course of study in the Department encompasses general and area-specific requirements but is further tailored to meet the student's individual needs and interests. Regardless of program area affiliation

and specific interests, a Ph.D. in Educational Psychology requires attainment of a core set of goals to ensure that students are well prepared for a career in their chosen area of concentration.

Knowledge

1. Students will acquire a strong foundation in current and past theories, research findings, and methodologies in the Learning Sciences. They will use critical thinking skills to synthesize existing knowledge, evaluate strengths and limitations in existing theory and research, and identify issues in need of additional inquiry—including theoretical and methodological approaches available to address these issues.
2. Students will demonstrate a knowledge of and sensitivity to human diversity in terms of individual abilities and orientations and sociocultural backgrounds.

Research / Evaluation

1. Students will retrieve, evaluate, and interpret Learning Sciences literature; they will use this information to develop or adapt theoretical frameworks and derive testable hypotheses or predictions for their own research projects.
2. Students will learn to design realistic and feasible research projects in the Learning Sciences and to prepare necessary protocols that are sensitive to the backgrounds of individuals who are the focus of their work.
3. Students will conduct independent research and analyze and interpret resulting data.

Communication

1. Students will create clear and concise reports of their research projects that are appropriate to Learning Sciences audiences, which include fellow Learning Sciences scholars (via scholarly journals), practitioners (via practitioner journals or reports), and lay audiences (via online or other published reports).
2. Students will learn to communicate effectively in verbal presentations and discussions with fellow students and Learning Sciences researchers.

Ethical Conduct

1. Students will conduct their research projects in accordance with ethical standards established in educational psychology and Learning Sciences fields.

Class Schedule

| Theme | Date | Topic & Readings | Assignments |
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| Introduction | 1/26 | Week 1: Introduction & Recap <i>Required preparation resources:</i> Sawyer (2006a): Introduction Sawyer (2014): Introduction <i>Recommended resources:</i> ISLS Video Chris Hoadley | <ul style="list-style-type: none"> • none |
| Theoretical model 1 | 2/2 | Week 2: Scaffolding <i>Required preparation resources:</i> Reiser & Tabak (2014) Tabak & Baumgartner (2014) <i>Recommended resources:</i> ISLS Video Iris Tabak & Brian Reiser | <ul style="list-style-type: none"> • Summary and discussion question |
| | 4/7 | No class | |
| Intervention 1a | 2/16 | Week 3: Cognitive Tutors <i>Required preparation resources:</i> Koedinger & Corbett (2006) VanLehn (2011) <i>Recommended resources:</i> ISLS Video Vincent Aleven | <ul style="list-style-type: none"> • Summary and discussion question • Introduction due to partner, Thursday 11:59pm |
| Intervention 1b | 2/23 | Week 4: Inquiry learning <i>Required preparation resources:</i> Cobb & McClain (2006) Linn et al. (2014) <i>Recommended resources:</i> ISLS Video Sadhana Puntambekar | <ul style="list-style-type: none"> • Summary and discussion question • Introduction due to instructor, Thursday 11:59pm |
| Methods 1 | 3/2 | Week 5: Learning analytics and educational data mining <i>Required preparation resources:</i> Baker & Siemens (2014) Rau (2017) <i>Recommended resources:</i> ISLS Video Carolyn Rosé | <ul style="list-style-type: none"> • Summary and discussion question |
| Theoretical model 2 | 3/9 | Week 6: Cognitive apprenticeship <i>Required preparation resources:</i> Collins & Kapur (2014) Collins (1991) <i>Recommended resources:</i> Jean Lave talk | <ul style="list-style-type: none"> • Summary and discussion question • Methods due to partner, Thursday 11:59pm |

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| | 3/17 | Spring break | |
| Intervention 2 | 3/23 | Week 7: Problem-based learning <i>Required preparation resources:</i> Lu et al. (2014) Hmelo-Silver & Barrows (2006) <i>Recommended resources:</i> ISLS Video Cindy Hmelo-Silver | <ul style="list-style-type: none"> • Summary and discussion question • Methods due to instructor, Thursday 11:59pm |
| Methods 2 | 3/30 | Week 8: Discourse analysis <i>Required preparation resources:</i> Sawyer (2006b) Chiu (2008) <i>Recommended resources:</i> ISLS Video Ming Ming Chiu | <ul style="list-style-type: none"> • Summary and discussion question |
| Theoretical model 3 | 4/6 | Week 9: Collaborative learning <i>Required preparation resources:</i> Miyake & Kirschner (2014) Dillenbourg et al. (2009) <i>Recommended resources:</i> ISLS Video Pierre Dillenbourg | <ul style="list-style-type: none"> • Summary and discussion question • Results & discussion due to partner, Thursday 11:59pm |
| Intervention 3a | 4/13 | Week 10: Knowledge-building communities <i>Required preparation resources:</i> Scardamalia & Bereiter (2014) Bielaczyc & Collins (2005) <i>Recommended resources:</i> ISLS Video Jim Slotta | <ul style="list-style-type: none"> • Summary and discussion question • Results & discussion due to instructor, Thursday 11:59pm |
| Intervention 3b | 4/20 | Week 11: Game-based learning <i>Required preparation resources:</i> Steinkuehler & Squire (2014) Barab et al. (2010) <i>Recommended resources:</i> Jane McGonigal talk | <ul style="list-style-type: none"> • Summary and discussion question • Final paper due to partner, Thursday 11:59pm |
| Intervention 3 | 4/27 | Week 12: Analyzing collaboration <i>Required preparation resources:</i> Enyedi & Stevens (2014) Koschmann (2013) <i>Recommended resources:</i> ISLS Video Tim Koschmann | <ul style="list-style-type: none"> • Summary and discussion question • Final paper due to instructor, Thursday 11:59pm |

Conclusion 5/4

Week 13: Conclusion & presentations

Required preparation resources:
Hoadley & Van Haneghan (2011)

- Summary and discussion question
- **Final presentations in class**

References

- Baker, & Siemens. (2014). Educational Data Mining and Learning Analytics. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (2 ed., pp. 253-272). New York, NY: Cambridge University Press.
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- Koschmann. (2013). Conversation Analysis and Collaborative Learning. In C. Hmelo-Silver, C. Chinn, C. Chan & A. O'Donnell (Eds.), *International Handbook of Collaborative Learning* (pp. 149-167). New York: Routledge.
- Linn, Eylon, Rafferty, & Vitale. (2014). Designing Instruction to Improve Lifelong Inquiry Learning. *Eurasia Journal of Mathematics, Science & Technology Education*.
- Lu, Bridges, & Hmelo-Silver. (2014). Problem-Based Learning. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (2 ed., pp. 298-318). New York, NY: Cambridge University Press.
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- Rau, M. A. (2016). Pattern mining uncovers social triggers of conceptual learning with physical and virtual representation In S. Barnes, M. Chi, & M. Feng (Eds.), *Proceedings of the 9th International Conference on Educational Data Mining* (pp. 478-483). Raleigh, NC: International Educational Data Mining Society.
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- Sawyer. (2006a). Analyzing Collaborative Discourse. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (1 ed., pp. 187-204). New York, NY: Cambridge University Press.
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VanLehn. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems and other tutoring systems. *Educational Psychologist*, 46(4), 197-221. doi: 10.1080/00461520.2011.611369

Videos

ISLS Video Chris Hoadley – Introduction Session: http://isls-naples.psy.lmu.de/intro/all-webinars/hoadley_video/index.html

ISLS Video Iris Tabak & Brian Reiser – Scaffolding: http://isls-naples.psy.lmu.de/intro/all-webinars/tabak_reiser_all/index.html

ISLS Video Vincent Aleven – Cognitive Tutors: <http://isls-naples.psy.lmu.de/intro/all-webinars/aleven/index.html>

ISLS Video Sadhana Puntambekar: Distributed Scaffolding – Interplay of the teacher, peers, curriculum and text in the classroom: <http://isls-naples.psy.lmu.de/intro/all-webinars/puntambekar2/index.html>

ISLS Video Carolyn Rosé – Learning analytics and educational data mining: http://isls-naples.psy.lmu.de/intro/all-webinars/rose_all/index.html

Jean Lave - An Apprenticeship in Critical Ethnographic Practice: <http://vimeo.com/28855105>

ISLS Video Cindy Hmelo-Silver – Problem-based learning: <http://isls-naples.psy.lmu.de/intro/all-webinars/hmelo-silver/index.html>

ISLS Video Ming Ming Chiu – Statistical discourse analysis: <http://isls-naples.psy.lmu.de/intro/all-webinars/chiu/index.html>

ISLS Video Pierre Dillenbourg – Introduction to CSCL Research: http://isls-naples.psy.lmu.de/intro/all-webinars/dillenbourg_video/index.html

ISLS Video Jim Slotta – Knowledge building and communities of learners: http://isls-naples.psy.lmu.de/intro/all-webinars/slotta_video/index.html

Jane McGonigal - Gaming can make a better world: http://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world?language=en

ISLS Video Tim Koschmann – Conversation and interaction analysis / ethnomethodological approaches: http://isls-naples.psy.lmu.de/intro/all-webinars/koschmann_all/index.html