Educational Psychology

Introduction to Learning Sciences II

Course Info

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Course Overview

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.

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.

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.

Expectations

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.

Class Cancellation Notices

Occasionally, severe weather, illness, or other circumstances may require cancellation of a class meeting. If this is so, we will send out an email to the class email list. It is the responsibility of each class member to be alert for and check email from the instructor or TA.

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 Moodle Course Site: https://ay15-16.moodle.wisc.edu/prod/course/view.php?id=839

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 marau@wisc.edu and jemichaelis@wisc.edu. Use Times New Roman, 12pt, single space, margins 1" on all sides. Include figures and tables in line with text. For all other specifications, refer to the APA style manual: http://www.apastyle.org/manual/

Communication

All email communication must include the TA and have the course number in the subject line.

Assignments

Extension Policy

If you need an extension due to unforeseable circumstances, you need to negotiate with the intructor **at least 48h prior to** the due date.

Weekly Assignments

Summary and discussion questions

By Mondays, 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 proposal for an empirical research study. The proposal 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 proposal 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.

1. Introduction

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. The assignment may not exceed 1000 words, excluding figures and references. Specific assignment details and grading rubric will be provided.

Due to partner: February 3 at 11:59 pm; due to instructor: February 10 at 11:59pm.

2. Methods

In the methods section, you will describe the study design, instructional and assessment materials, as well as planned analyses for the proposed study. The assignment may not exceed 1000 words, excluding figures and references. Specific assignment details and grading rubric will be provided.

Due to partner: February 24 at 11:59 pm; due to instructor: March 2 at 11:59pm.

3. Results and Discussion

The results section should describe anticipated results for each method. The discussion section should describe the 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 learn-

ers). The assignment may not exceed 2000 words, excluding figures and references. Specific assignment details and grading rubric will be provided.

Due to partner: March 30 at 11:59 pm; due to instructor: April 6 at 11:59pm.

4. Final Write-Up and Presentation

You will present the final version of your research proposal in a write-up and in class. Integrate the feedback you received on previous capstone assignments. The final write-up may not exceed 4000 words, excluding figures and references. Specific assignment details and grading rubric will be provided. For the class presentation, plan on a 10-minute presentation, followed by 10 minutes of discussion.

Due to partner: April 20 at 11:59 pm; due to instructor: April 27 at 11:59pm. Final presentations will take place in class on May 4.

Grading

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

Class participation & posts	20%
Deliverable 1:	20%
Deliverable 2:	20%
Deliverable 3:	20%
Final write-up & presentation:	20%

Policies and Resources

Disability Reasonable Accommodation

If you qualify for accommodations because of a disability, please submit a letter to an instructor that outlines your request in a manner that is timely and consistent with established university policies for making such request so that your needs may be addressed. Policies for accommodating disabilities are available through the McBurney Disability Resource Center, 903 University Ave., 608-263-2741 (phone), 263-6393 (TTY), 265-2998 (Fax), mcburney@uwmadmail.services.wisc.edu. For additional information, please see http://www.mcburney.wisc.edu/

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.

Student Honesty and Rules of Conduct

Academic honesty requires that the course work (drafts, reports, examinations, papers) a student presents to an instructor honestly and accurately indicates the student's own academic efforts. These policies are available at http://www.studentaffairs.wisc.edu/

UWS 14 is the chapter of the University of Wisconsin System Administrative code that regulates academic misconduct. UW-Madison implements the rules defined in UWS 14 through our own "Student Academic Misconduct Campus Procedures." UWS 14.03 defines academic misconduct as follows:

"Academic misconduct is an act in which a student: (a) seeks to claim credit for the work or efforts of another without authorization or citation; (b) uses unauthorized materials or fabricated data in any academic exercise; (c) forges or falsifies academic documents or records; (d) intentionally impedes or damages the academic work of others; (e) engages in conduct aimed at making false representation of a student's academic performance; (f) assists other students in any of these acts."

If you are accused of misconduct, you may have questions and concerns about the process. If so, you should feel free to call Student Advocacy & Judicial Affairs (SAJA) in the Offices of the Dean of Students at 263-5700 or send an e-mail to dos@bascom.wisc.edu.

Class Schedule

Theme	Date	Topic & Readings	Assignments
Introduction	1/20	***Week 1: Introduction & Recap*** *Required preparation resources:* Sawyer (2006): Introduction Sawyer (2014): Introduction *Recommended resources:* ISLS Video Chris Hoadley	• none
Theoretical model 1	1/27	***Week 2: Scaffolding*** *Required preparation resources:* Reiser & Tabak (2014) Tabak & Baumgartner (2014) *Recommended resources:* ISLS Video Iris Tabak & Brian Reiser	• Summary and discussion question
Intervention 1a	2/3	***Week 3: Cognitive Tutors*** *Required preparation resources:* Koedinger & Corbett (2006) VanLehn (2011) *Recommended resources:* ISLS Video Vincent Aleven	• Summary and discussion question • **Introduction due to partner**
Intervention 1b	2/10	***Week 4: Inquiry learning*** *Required preparation resources:* Cobb & McClain (2006) Linn et al. (2014) *Recommended resources:* ISLS Video Sadhana Puntambekar	• Summary and discussion question • **Introduction due to instructor**
Methods 1	2/17	***Week 5: Learning analytics and educational data mining*** *Required preparation resources:* Baker & Siemens (2014) Rosé et al. (2008) *Recommended resources:* ISLS Video Carolyn Rosé	• Summary and discussion question
Theoretical model 2	2/24	***Week 6: Cognitive apprenticeship*** *Required preparation resources:* Collins & Kapur (2014) Collins (1991) *Recommended resources:* Jean Lave talk	• Summary and discussion question • **Methods due to partner**

Intervention 2	3/2	***Week 7: Problem-based learning*** *Required preparation resources:* Lu et al. (2014) Savery (2006) *Recommended resources:* ISLS Video Cindy Hmelo-Silver	• Summary and discussion question • **Methods due to instructor**
Methods 2	3/9	***Week 8: Discourse analysis*** *Required preparation resources:* Sawyer (2006) Chiu (2008) *Recommended resources:* ISLS Video Ming Ming Chiu	• Summary and discussion question
Theoretical model 3	3/16	***Week 9: Collaborative learning*** *Required preparation resources:* Miyake & Kirschner (2014) Dillenbourg et al. (2009) *Recommended resources:* ISLS Video Pierre Dillenbourg	• Summary and discussion question
	3/23	Spring break	
Intervention 3a	3/30	***Week 10: Knowledge-building communities*** *Required preparation resources:* Scardamalia & Bereiter (2014) Bielaczyc & Collins (2005) *Recommended resources:* ISLS Video Jim Slotta	• Summary and discussion question • **Results & discussion due to partner**
Intervention 3b	4/6	***Week 11: Game-based learning*** *Required preparation resources:* Steinkuehler & Squire (2014) Barab et al. (2010) *Recommended resources:* Jane McGonigal talk	• Summary and discussion question • **Results & discussion due to instructor**
	4/13	AERA	
Methods 3	4/20	***Week 12: Analyzing collaboration*** *Required preparation resources:* Enyedi & Stevens (2014) Koschmann (2013) *Recommended resources:* ISLS Video Tim Koschmann	• Summary and discussion question • **Final paper due to partner**

Conclusion	4/27	***Week 13: Conclusion*** *Required preparation resources:* Sawyer (2014) Conclusion Hoadley & Van Haneghan (2011)	• Summary and discussion question • **Final paper due to instructor**
Finale	5/4	***Week 14: Final presentations***	• **Final presentations in class**

References

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Bielaczyc, K., & Collins, A. (2005). Fostering knowledge-creating communities. In A. M. O'Donnell, C. E. Hmelo-Silver & G. Erkens (Eds.), Collaborative learning, reasoning, and technology (pp. 37-60). Maywah, NJ: Lawrence Erlbaum Associates.

Chiu. (2008). Flowing toward correct contributions during group problem solving: A statistical discourse analysis. Journal of the Learning Sciences, 17(3).

Cobb, & McClain. (2006). Guiding Inquiry-Based Math Learning. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (1 ed., pp. 171-186). New York, NY: Cambridge University Press.

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Hoadley, & Van Haneghan. (2011). The Learning Sciences: Where they came from and what it means for instructional designers. In R. A. Reiser & J. V. Dempsey (Eds.), Trends and Issues in Instructional Design and Technology (3 ed., pp. 53-63). New York: Pearson.

Koedinger, & Corbett. (2006). Cognitive Tutors: Technology Bringing Learning Sciences to the Classroom. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (1 ed., pp. 61-77). New York, NY: Cambridge University Press.

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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.

Miyake, & Kirschner. (2014). The Social and Interactive Dimensions of Collaborative Learning. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (2 ed., pp. 418-438). New York, NY: Cambridge University Press.

Reiser, & Tabak. (2014). Scaffolding. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (2 ed., pp. 44-62). New York, NY: Cambridge University Press.

Rosé, Wang, Cui, Arguello, Stegmann, Weinberger, & Fischer. (2008). Analyzing collaborative learning processes automatically: Exploiting the advances of computational linguistics in computer-supported collaborative learning. Computer-Supported Collaborative Learning, 3, 237–271.

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Sawyer. (2014a). Conclusion: The Future of Learning: Grounding Educational Innovation in the Learning Sciences. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (2 ed., pp. 726-746). New York, NY: Cambridge University Press.

Sawyer. (2014b). Introduction: The New Science of Learning. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (2 ed., pp. 1-18). New York, NY: Cambridge University Press.

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Steinkuehler, & Squire. (2014). Videogames and Learning. In R. K. Sawyer (Ed.), The Cambridge Handbook of the Learning Sciences (2 ed., pp. 377-394). New York, NY: Cambridge University Press.

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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