EDUC 639: Design of Learning Environments:
Theories, Methods, Designs, and Applications

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Course Description

This course is a survey of the kinds of theories, methods, design considerations, and applications through which educational researchers understand and design environments to improve learning. The course features the most recent trends in learning primarily through educational technologies. It includes perspectives that consider, who is learning, how it is being learned, what design variables are needed to ensure learning takes place in different learning environments, and societal and technological influences on learning.

The educational field that most of the course draws on is called the learning sciences. The learning sciences is a relatively new field of research in education that began in the late 80s. It is an interdisciplinary field consisting of researchers who study among other things, cognition, science and math education, language literacy, anthropological and sociological perspectives, computer science, and educational psychology. Learning scientists study learning as it happens in real world contexts and design resources and environments to improve learning in those contexts. This can happen in school, in informal places, and online. Designing resources and environments can include curricula, instructional strategies, digital and computational tools, and professional development programs.

Four main learning goals underpin the course content:
1. Understanding learning needs of youth as they interact in society and in school.
2. Investigating the main learning theories and methods influencing the field and how they are instantiated in practice.
3. Examining and reflecting on how technologically designed learning environments address important learning challenges.
4. Evaluating how these learning environments and applications have helped learning, how they have not, and how they can be improved.

The course's scope and sequence is divided into two sections.

Section I: Foundations, Learning Theories, and Methods
This section investigates current theories, relationships to real world learning, and methods that inform learning sciences research.

This section investigates the learning designs, goals that structure learning events, specific applications, and learning in practice.

Course Resources and Canvas Site

All course resources and weekly readings will be available on the course site. A pennkey and password are required to log in. The function of the course site is for discussion and collaboration on weekly readings and for sharing information or activities that you find interesting and relevant. It is intended to function as an anchor for the construction of a virtual academic community. Since our in-class meeting time is limited to two hours each week for a course that has three hours of content to cover, participation on the course site is essential and should be considered class time.

Expectations

Our class will engage in a variety of small group experiences and large group discussions. A successful class will depend on every member of the group actively collaborating as both learners and teachers. It is my assumption that each of us has valuable perspectives and experiences that will inform our collective, developing knowledge. It is important that you <u>come to class on time</u>. I expect that you will have <u>read the texts</u> carefully and will be prepared to actively participate in our class discussions both face-to-face and on Canvas. If you are going to miss a class you <u>must</u> contact me <u>prior</u> to the class to let me know. Late assignments will be <u>deducted a half a letter grade</u> for every day that an assignment is submitted after the approved date (extensions must be negotiated at least a week <u>prior</u> to the due date). <u>Any assignments submitted 7 days after the deadline will receive a failing grade</u>.

10 Pointers for Good Academic Essay Writing

1. A good general rule to follow in the structure of your papers is "tell them what you're going to say, tell them, then tell them what you said". In the introduction, provide a roadmap of what you are going to say in the paper. It will help your own organization and organizes the paper for the reader to follow your arguments along.
2. Be explicit about your questions, thesis, perspective, and put it up front in your introduction. It's best not to leave your reader(s) guessing what the paper is about.
3. Provide signposts or points to your roadmap, e.g., "in this section, the following point…" or "to summarize" or "having covered the…we will now turn to…"
4. Section titles are also good as signposts but be sure that the content of the section reflects the title of the section.
5. Use transition sentences that build from pervious information and connects to the next.
6. Explain terms. Don't put them in quotes and assume the reader will know what you mean. Try very hard not to make assumptions about what the reader knows even

though you know who the reader is and he/she might be an expert in your topic. The point is for you to demonstrate that you know the material.

7. Be consistent with your bibliographic referencing style.
8. Be careful not to over-generalize, e.g., "many theorists…" when you are only referencing one study.
9. Don't assume everyone sees or agrees with your perspective. You need to convince the reader of your perspective.
10. Summarize in the conclusion, what you wrote about in the body of the paper. Tie your conclusions back to your original question…how have you proven, answered, shown, presented information that addresses it. Don't introduce new information in the conclusion. It detracts from the cohesiveness.

Policy on Plagiarism

Plagiarism is the act of presenting someone's words, thoughts or data as your own. There are several ways that plagiarism can be committed. Inserting portions of texts such as sentences and paragraphs into your paper that have been copied from another paper is one way. Another way is to paraphrase or quote text or media from another source without properly citing or giving attribution. The second way can be avoided by using proper APA-style documentation or bibliographic referencing. It is mandatory for this course and graduate school in general. The first way should be avoided by not doing it at all as there are many means of determining if something has been plagiarized and you will most likely get caught.

Plagiarism is a serious offense. University policy states that students who are caught plagiarizing will face negative disciplinary consequences including a failing grade on the paper, a failing grade in the course and/or removal from the degree program. The case may also be referred to the GSE Committee on Degrees or the University of Pennsylvania Office of Student Conduct.

If you are unsure about what it means to plagiarize or suspect that what you have done constitutes plagiarism, please consult with me first before you officially submit your paper or assignment.

Grading Criteria

Written Assignments
Unless otherwise advised in advance, all written assignments are to be completed in the following format:
1. MS Word file with student's last name, course, and assignment type in the file name, e.g., yoon639assign1.doc.
2. 8.5 x 11, single-spaced.
3. Times or Times New Roman, 12 pt. font.
4. 1 inch page margins

Grades for assignments and the over-all course will be based on the following heuristic:

Letter Grade	Grade Point
A	3.85-4.0
A-	3.5
B+	3.15
B	2.85

It is possible to receive a grade of A+, however, any assignment that merits this grade will have greatly exceeded expectations. Any assignment receiving less than a B will require revision and resubmission.

Due Dates and Evaluation at a Glance

The following table is a quick reference guide for assignments, due dates and percent of course grade for each. More detailed information about each assignment is listed below. Please note that assignment criteria may be changed slightly and/or further detailed during the term.

Assignment or Activity	Due Date (2014)	Evaluation %
Weekly online discussions	On-going throughout term	25
In-class discussion facilitator	Two selected weeks	10
Theorizing Practice paper	October 28	25
Half-page outline of final assignment	November 4	Not graded
Constructing a learning environment		
- In-class presentation	December 9 or 16	5
- Product	December 16	10
- Design Paper	December 16	20
Participation and attendance	On-going throughout term	5

Assignments

Weekly Online Discussions (25%, Due weekly)
In order to build a collaborative learning community, this on-going assignment involves posting and responding to comments, thoughts, insights or reflections online with respect to the weekly readings and your own related educational experiences. Use this virtual space to connect with other classmates to help you think through the concepts we are learning in the course. Virtual environments like these often become self-organized and take off without a minimum participation criteria enforced. However, as everyone's continuous participation is essential in creating this virtual community, a minimum of 2 posts per week is required. For the 2-post minimum, each post should include:

1. Selected information or data from the literature;
2. Interpretation of the literature;

3. Relationships you draw from the literature between your understanding and another student's post, literature from the class, or literature from outside sources;
4. Experiences you have had based on practice or points you would like to contribute based on your own understanding.

Beyond the 2-post minimum, you can respond or comment as many times as you would like without adhering to the above criteria.

Since you will need time to do the readings before you can participate on the site, discussion should begin by noon on Wednesday and continue until midnight Saturday.

Discussion Facilitator (10%, Due any two weeks between Sept 9th and Dec 9nd)

You will sign up to be discussion facilitator with another person for two week's readings on the first day of class. There are two parts to this assignment.

The first part entails monitoring your group's online discussion and evaluating the contributions of your peers. You will read each post and assign a point score of 1 to 4 depending on completion using the above criteria. We will review exemplary posts on the first day of class. After you have evaluated each group member's collective posts, please email them with their score and copy Betty (bettychandy@gmail.com) no later than Tuesday morning at noon.

For the second part, you will summarize the main ideas that have emerged from your group's discussion. You will meet with the other group's facilitators and select an issue or interesting point that may have been unresolved in the online discussion or could extend the discussion in the face-to-face mode. Together you will prepare a short presentation and lead a whole class discussion on the issue or interesting point. Choosing alternative formats for the discussion is strongly encouraged. Please see examples for more details.

Assignment #3: Theorizing Practice Paper (25%; Due October 28)
An essential aspect of the field of the learning sciences is the practical or applied nature of research activities. From student curricular experiences to teacher professional development, much learning sciences research focuses on how particular interventions informed by theories of design, culture, and cognition, impact classrooms and other educational real world contexts.

In this assignment, you will begin with an educational experience you have observed, led, or participated in for which the design of the learning environment fundamentally influenced learning outcomes. In a 3-4 page single-spaced paper (excluding references), you will critically analyze the experience using the topics or lenses we have investigated in the first 6 weeks of the course. In addition to the course readings, a review of at least two other external sources is required. Begin your paper with a short (1-2 paragraph) description of a specific episode or ongoing issue you have experienced in practice. Identify the issue or problem of practice as a specific question. You will then organize

your paper around a response to this specific question and provide descriptions or explanations from your experience and the literature to support your claims. You will be evaluated on the depth to which you have addressed the question, evidence to support your claims, and the coherence and consistency of the paper. Make sure to reference the literature in your paper (including a reference section at the end). See examples of this assignment on the course website.

The following rubric will be used for assessment:

Theorizing Practice Paper	Needs Further Articulation (B-/B)	Adequately Articulated (B+)	Well Articulated (A-/A)	Comments
Identification of Educational Experience The paper introduces and describes a relevant problem of practice.				
Engagement with literature The paper relates the problem of practice to important ideas and evidence in the literature including two additional scholarly sources.				
Coherence and Style The paper presents a clear, organized, coherent and convincing line of thought. The paper includes an introduction and conclusion summarizing the key arguments. The paper uses APA bibliographic referencing appropriately?				

Assignment #4: Construct a Learning Environment (Due November 4; December 9 or 16 and December 16)

Design of Learning Environment (10%; final due December 16)
For this assignment, you will construct a learning environment in a group of two or on your own based on topics in the course or one that you are interested in. This can be one within a physical space, or a virtual environment or a blend of both. For example, if you are a classroom teacher you may analyze and reconstruct a lesson unit that you have taught or will teach. If you are in the field of professional development, you can create an online module for your target group. If you are interested in mobile technologies, you may be interested in designing an app (you don't actually have to build the app but you need to provide details and description about how the app environment works and its functionality). On November 4, you will submit a half page outline of the final assignment that includes product information, target population and group members (this is not graded).

Design paper (20%; final due December 16)

You will submit (individually) a 3 page single-spaced design paper (excluding references) that includes an introduction, brief literature review that describes the learning theories used to design the learning environment, description about the population, goals, structure, assessment, challenges and added value of the learning environment such that you are able to identify whether your design complements, substitutes, or compensates existing practices and ideas.

Final Class Learning Environment Presentation: December 9 or 16 (5%)
For the last two classes, please prepare a presentation of your learning environment in the presentation format of your choice. The presentation should be no more than 5 minutes. You will sign up for the presentation slot in the middle of the semester.

In-class Participation and Attendance (5%)
Please be advised that cooperative group learning structures will be a primary teaching and learning strategy in the class. As such, your participation in face-to-face meetings as well as on the course website is critical to not only your own learning but also the learning of others.

Course Scope and Sequence

September 2nd   **Course Introduction**

September 9th   **Learning and Technology in Today's World**

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 K-12 Edition*. Austin, Texas: The New Media Consortium.

Anderson, J., & Raine, L. (2014). *Digital life in 2025: Pew Research Internet Project*. Retrieved from http://www.pewinternet.org/2014/03/11/digital-life-in-2025/

Gardner, H., & Davis, K. (2013). Personal identity in the age of the app. In *The app generation* (pp. 60-91). New Haven: Yale University Press.

September 16th   **Activity Systems**

Collins, A. & Halverson, R. (2009). Conclusion. In *Rethinking Education in the Age of Technology: The Digital Revolution and the Schools*. New York: Teachers College Press.

Groff, J. (2013). *Technology-rich innovative learning environments*. Commissioned report to the OECD.

Boyd, D. (2014). Literacy, are today's youth digital natives? Chapter 7 (pp. 176-198). *In It's*

complicated, the social lives of networked teens.

September 23rd   **Learning Theories**

Partnership for 21st Century Skills (2007). *The Intellectual and Policy Foundations of the 21st Century Skills Framework*. Tucson, AZ 1-24.

Greeno, J. (2006). Learning in activity. In K. Sawyer (ed.), *The Cambridge Handbook of the Learning Sciences*, (pp. 79-96). New York: Cambridge University Press.

Scardamalia, M., & Bereiter, C. (2006). Knowledge building. In K. Sawyer (ed.), *The Cambridge Handbook of the Learning Sciences*, (pp. 97-115). New York: Cambridge University Press.

Kain, D., & Wardle, E. (n.d.). Activity theory: An introduction for the writing classroom. Retrieved from https://writing.opencourse.stedwards.edu/resources/activity-theory-introduction-writing-classroom.

September 30th   **Design and Characteristics of Learning**

Bransford, J.D., Brown, A.L., & Cocking, R.R. (2000). Design of learning environments, Chapter 6 (pp. 131-154). In *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.

Bielzczyc, K. (2013). Informing design research: Learning from teachers' designs of social infrastructure. *Journal of the Learning Sciences*, *22*(2), 258-311.

Bereiter, C. (2014) Principled practical knowledge: Not a bridge but a ladder. *Journal of the Learning Sciences*, *23*(1), 4-17.

October 7th   **Assessment**

Darling-Hammond, L., Adamson, F. (2013). *Developing assessments of deeper learning: The costs and benefits of using tests that help students learn*. Stanford, CA: Stanford University, Stanford Center for Opportunity Policy in Education.

Davidson, C. (2011). How we measure. In *Now you see it* (pp. 105-131). New York, NY: Viking Penguin.

Clarke-Midura, J., Dede, C. (2010). Assessment, technology, and change. *Journal of Research on Technology in Education*, *42*(3), 309-328.

October 14ᵗʰ   Scaffolding for Learning and Scaffolding for Design

Tabak, I. (2004). Synergy: A complement to emerging patterns in distributed scaffolding. *Journal of the Learning Sciences*, *13*(3), 305-335.

Hsin, C., & Wu, H. (2011). Using scaffolding strategies to promote young children's scientific understandings of floating and sinking. *Journal of Science Education and Technology*, *20*, 656-666.

Kim, M. C., & Hannafin, M. J. (2011). Scaffolding problem solving in technology-enhanced learning environments (TELEs): Bridging research and theory with practice. *Computers & Education*, *56*, 403-417.

Yoon, S., & Wang, J., (2014). Making the invisible visible in science museums through augmented reality devices. *Tech Trends*, *58*(1), 49-55.

October 21ˢᵗ   Games and Simulations

Smetana, L. K., & Bell, R. L. (2012). Computer Simulations to Support Science Instruction and Learning: A critical review of the literature. *International Journal of Science Education*, *34*(9), 1337–1370.

Honey, M. A. & M. Hilton (2011). Simulations and games in the classroom, Chapter 3 (57-68). In *Learning Science Through Computer Games and Simulations*. National Academies Press, Washington DC.

Berns, A., Gonzalez-Pardo, A., & Camacho, D. (2013). Game-like language learning in 3-D virtual environments. *Computers & Education*, *60*, 210-220.

October 28ᵗʰ   New Literacies

Halverson, E. (2013). Digital art making as a representational process. *Journal of the Learning Sciences*, *22*(1), 121-162.

Leu, D., McVerry, J. O'Bryne, W., Kiili, C., et al. (2011). The new literacies of online reading comprehension: Expanding the literacy and learning curriculum. *Journal of Adolescent & Adult Literacy*, 55(1), 5-14.

Thompson, C. (2013). The new literacies. In *Smarter than you think: How technology is changing our minds for the better* (pp. 83-113). New York, NY: The Penguin Press.

Theorizing Practice paper due here.

November 4ᵗʰ   Constructionism and Maker Spaces

Kafai, Y. (2006). Constructionism. In K. Sawyer (ed.), *The Cambridge Handbook of the Learning Sciences*, (pp. 35-46). New York: Cambridge University Press.

Kafai, Y., & Peppler, K. (2011). Youth, technology, and DIY: Developing participatory competencies in creative media production. *Review of Research in Education*, *35*(89), 89-119.

Resnick, M., Maloney, J., Monroy-Hernandez, A., Rusk, N., et al. (2009). Scratch: programming for all. *Communications of the ACM*, *52*(11), 60-67.

Submit a half page outline of the final assignment that includes product information, target population and group members (this is not graded).

November 11ᵗʰ   Augmented Reality/Mixed Reality

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education*, *62*, 41-49.

Lindgren, R., & Johnson-Glenberg, M. (2013). Emboldened by embodiment: Six precepts for research on embodied learning and mixed reality. *Educational Researcher*, *42*(8), 445-452.

Cuendet, S., Bonnard, Q., Do-Lenh, S., & Dillenbourg P. (2013). Designing augmented reality for the classroom. *Computers & Education*, *68*, 557-569.

November 18ᵗʰ   Informal Learning

Banks, J. Au, K., Ball, A., Bell, P. et al. (2007). *Learning and Out of School in Diverse Environments: Life-Long, Life-Wide, Life-Deep*. Washington D.C.: The LIFE Center.

Yoon, S. A., Elinich, K., Wang, J., Schooneveld, J. B., & Anderson, E. (2013). Scaffolding Informal Learning in Science Museums: How Much Is Too Much? *Science Education*, *97*(6), 848-877.

Falk, J., Storksdieck, M. (2010). Science learning in a leisure setting. *Journal of Research in Science Teaching*, *47*(2), 194-212.

November 25ᵗʰ   Online Learning/MOOCs

Hew, F., & Cheung, W. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review*, *12*, 45-58.

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *International Review of Research in Open and Distance Learning,* 12(3). 19-38.

Siemens, G. (2004). *Connectivism: A Learning Theory for the Digital Age*. [online]. Retrieved August 22, 2014 from http://www.elearnspace.org/Articles/connectivism.htm

December 2nd   Critical Perspectives

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, *34*(1), 179–225.

Gardner, H., & Davis, K. (2013). Conclusion: Education in the era of the apps. In the *App Generation* (pp. 173-197). New Haven: Yale University Press.

Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., et al. (2013). *Connected Learning: An Agenda for Research and Design*. Irvine, CA: Digital Media and Learning Research Hub.

December 9th   Teachers and Professional Development

Dede, C., Ketelhut, D., Whitehouse, P., Breit, L., & McCloskey, E. (2009). A research agenda for online teacher professional development, *Journal of Teacher Education*, *60*(8), 8-19.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education, 59,* 423-435.

Fishman, B., Konstantopoulos, S., Kubitskey, B. W., Vath, R., Park, G., Johnson, H., & Edelson, D. (2013). Comparing the impact of online and face-to-face professional development in the context of curriculum implementation. *Journal of Teacher Education*, *64*(5), 426-438.

In class presentation of the designed learning environment

December 16th   Final Class

In class presentation of the designed learning environment

Submit final design paper