ELT 740 - Applied Seminar in Learning Technologies
Building, Making and Computational Thinking

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Quick Note About Communicating & Expectations:

In general, text and email are better than voice. If you leave me a voice mail, let me know if it's ok for me to reply by text. In general, make sure you tell me who you are, and give enough context that I can reasonably answer your question. Generally speaking, I'm quick to reply. If it's not a holiday or weekend, and you haven't received a response within 24 hours, assume that either I didn't get your email or I've been eaten my zombies.

Course Description

This course functions as a workshop seminar in which students explore project-based learning while building and debugging objects with a variety of technologies. Course content focuses on design thinking, computational thinking, constructionism in action, project-based learning, and the DIY/Maker habit of mind. Over the semester students construct two or more products that inform, interact, or inspire. Examples include mobile applications, Arduino applications, web collaboration sites, interactive gadgets, a virtual world, or media mashups. Prerequisites: EDLT 770AB, 725, and 727.

Course Objectives

Upon completion, the "A" student will be able to:

- View learning problems as inspiration for artifacts and design thinking
- Explore the hands on growing world of DIY, Make
- Practice being inspired, emotional design.
- Find and examine a variety of constructionist resources, including tools and communities
- Acquire principles of design thinking
- Acquire principles of computational thinking
- Connect design and computational thinking with constructionist perspectives on learning
- Make something tangible that embodies these principles

Reading & Other Stuff You Need

Required Texts:

- Mindstorms – Seymour Papert
- Invent to Learn – Martinez & Stager
- Sew Electric – Leah Buechley
- Additional readings as PDFs in Sakai.

Optional Texts:

- Minecraft Redstone Handbook – Mojang
- Minecraft Construction Handbook – Mojang

Required Materials:

- Protosnap - Lilypad Development Board (see link below)
- Minecraft - Check the link below for discount.

Course Overview

The Big Picture

Since the beginning of educational technology or learning technologies, two competing ideas about the role of technology in learning have dominated most of the conversations. The first that technology is a conduit for the delivery of information or content. The second views technology and devices as tools for expression of thinking and learning, where "content" is not at the center of the conversation. In this course we will take a critical look at "computational thinking" – what it means, where it fits, and how it looks in practice.

This course will have two parts: The first is focused on Maker/DIY culture, which originates outside the school. The second part of the course is a more intense look at computational thinking, which is emerging as an important digital literacy.

There are three forms of participation in this class:

1. Conceptual

Your goal for this class should be mastery of the critical concepts of each area to the point where an informed opinion can be made on each, and where you can speak authoritatively on the subjects' relation to the field of study. To that end, there will be two papers due – one for each section of the class:

Maker Paper - Due Oct. 11
Explain the relationship between learning theory and the MAKER/DIY movement. How does it / can it relate to formal learning settings? Offer an example of what this might entail in working with adult learners in your workplace setting (i.e., professional development). You should leverage of EDLT 770A & B here, as well as Papert and Dewey.

Computational Thinking Paper - Due Dec. 1
There is a huge push on "computational thinking" as a new literacy, but Rushkoff and Groom offer a very different perspective in support of a similar idea. A third growing group of mostly compsci professionals are pushing back on the notion of coding for all. Is coding all there is to CT? Is it the best or most meaningful definition of CT? Does everyone need CT? What are the implications of "templated self" and how does CT push back against that, or does it? Think hard and make a decision on the issue of CT. Write a paper that defines, defends, and offers an example in support of your opinion.

When you submit a paper for this class you are expected to:

- write at a graduate level.
- use APA format.
- check spelling, grammar, and punctuation.
- work within the assignment parameters
- construct logical, organized, cohesive propositions.
- reference all quoted material.
- eschew over-quoting or lightly paraphrasing other people's work.

Seek writing assistance if needed. The writing center people want to help you.

2. Construction

The construction element of this class requires you to create a hands-on project using Arduino or Raspberry Pi (The former is what we will start with at F2F. If you discover that Arduino doesn't meet your needs, you may choose to "upgrade").

Here are the project details:

Lilypad/Arduino project – Due Dec. 8
Construct an interactive Lilypad/Arduino/R Pi object. It can be on a t-shirt or a backpack or any other item appropriate for housing a Lilypad or Arduino board (Note: I have just narrowed the field to … almost anything. Be creative)

Your project will be scored using a rubric that looks for:

- Interactivity –responds to user, web, or environmental input;
- Complexity – the amount of work the program does, and/or the programmatic difficulty of accomplishing the task;
- Software Design – coding tasks are accomplished in the least number of steps (as opposed to verbose coding that misses opportunities to condense and shorten the code);
- Physical Construction – Should be neat and tidy; the interface is easy to use;
- Functionality – it works as intended, bug free;
- Creativity – not a replication of an existing project on the web.

Document your project in a 3-5 min. "how to" video and upload it to our site.

Your project should be well-designed, carefully constructed, and "big" enough to satisfy the expectations of a full semester project. As you explore maker projects and culture, you will see that craftsmanship is a value that is held in high regard by many makers. In other words, this should not be a weekend project. Take the time to immerse yourself in the construction of your object. Sharing is another important value in the maker community. Please use the WIKI tool in Sakai to share tips, ideas and code.

3. Participation

Probably the most important participation element in this class is your participation in the Sakai forums where most of the intellectual work of the course takes place. In forum discussions you should post thoughtful notes that question, extend, apply, or challenge ideas from readings, 'real life' experience, remarks I've made, or postings and remarks made by peers. You have time to craft a thoughtful response and time to read everyone else's remarks on the subject before you do. Avoid vacuous responses; instead try to move the discussion forward.

You do not get brownie points for having lots of posts, though you definitely get dinged for not posting enough. How much is enough? Consider that this is your primary means of interaction. At minimum I'd estimate 3-5 contributions a week. Many people will post more. Think of it this way: can you imagine being in a doctoral seminar and making only one or two remarks in class each week?

How to Win at Forums

I expect multiple postings in forums each week. I expect writing about reading, and writing about project work by connecting it with the ideas in the readings. After twenty years of online instruction I have a very clear sense of what to expect and what works best when students write about reading. AS YOU ARE READING a book, you will encounter sections that excite you because:

1. You agree enthusiastically with the author.
2. You disagree vehemently with the author
3. You are puzzled or confused by what the author has written.

Cite these sections in forums (quote 'em and give page numbers so we can find them too, in context) and share your thinking about your reaction to the section. Try to make sense; try to build on what others have said. Feel free to agree or disagree with each other, respectfully, and explain why.

With rare exception I expect the tone to be informal and conversational. Forum postings are not formal essays. I'm not a stickler about spelling and grammar, but let's try to use the spell checker when we know we don't know how to spell a word. Also, whenever possible make explicit reference to readings and offer page numbers where relevant. This helps us keep the postings more scholarly in content despite their conversational voice.

I have heard students say, "Heck, I learn a lot just from listening to other people in class. I can learn a lot just from reading what people say online." Unfortunately for you, I don't believe that. I think you can learn a little bit from listening to a class, but…well no I don't. I think you have the opportunity to learn from listening, but unless you work over the idea that you get from listening, unless you try to do something with it, to understand it actively, I don't think it offers more than an opportunity to learn. So how do you actively learn from passively listening/reading? You have to talk or write about your own thinking in response to what you've heard/read. We're humans and language is a primary tool for us, the main tool for making sense. (Note: I stole this from Polin, because why mess with perfection?)

How to Win at This Class

These things are good:

- Full intellectual engagement - This is grad school. Do you want a watered down doc degree? You choose the outcome of this program, not me.
- Involvement with the purpose of helping your colleagues learn - If I wanted you to write for my benefit, then I'd just have you keep a private journal. Engage with your cadre-mates.
- Curiosity and creative risk-taking - Risk more + fail more + recover well = learn more.
- Humility - Do it for your relationships.
- Craftsmanship in writing - Write at a grad level. Period. Take pride in your work.

These things are bad:

- Late work - I have a schedule, just like you. Except that your schedule affects me in a big way. Don't be late.
- Playing a victim - Life happens. In every situation, you have a choice to make: You can let it control you, or you can deal with it. Sometimes, stuff happens that is just too big or too horrible to deal with. However, when life's obstacles become a pattern of excuses, it's not a good thing.
- Bad attitudes - Nope. Put that away.
- Giving in to fear - Fear is normal. It's the thing that tries to prevent you from growth. Don't let it.
- Whining - Seriously? You are going to sign up for a Doc program, pay a lot of $$ for it, and then *whine?* Seriously?
- Hoarding - Not that kind of program. Share your stuff. Knowledge is an infinite resource.

Grades:

15% Participation
35% Maker Project
25% Paper 1
25% Paper 2

Class Schedule (Red weeks we will meet live on Th at 6am/6pm)

Week	Week Of	Topic	Reading	Assignment / Work
Week 1	9/7/2015	Making	MC Books	Minecraft Challenges
Week 2	9/14/2015	Making	Papert & Harel Mindstorms: Ch. 1-2 Sew Electric: 1-24	Minecraft Challenges
Week 3	9/21/2015	Making	Mindstorms: Ch. 3-5 Sew Electric: 25-61	Minecraft Challenges
Week 4	9/28/2015	Making	Mindstorms: Ch. 6-7 Pfister: Hats for House Elves Dewey: Experience & Education	F2F: Work on Maker Project
Week 5	10/5/2015	Making	Mindstorms: Ch. 8 & Afterword Kafai, Fields, Searle: Making Tech…	Paper 1 Due Oct. 11
Week 6	10/12/2015	Making	Buechley, L., & Hill, B. M. Buechley, L., Eisenberg, M., Catchen, J.,	
Week 7	10/19/2015	CT	Wing, J. M. (2006). csta.acm.org/Curriculum/sub/CompThinking.html Barr, D., Harrison, J., & Conery, L. (2011). National Research Council. (2010).	
Week 8	10/26/2015	CT	Reading Choice Week	
Week 9	11/2/2015	CT	https://www.youtube.com/watch?v=JKAzZocdQ1Y http://tommcfarlin.com/everyone-should-learn-to-code/	
Week 10	11/9/2015	CT	TBA	Maker Project Check-in
Week 11	11/16/2015	CT	Shein, E. (2014).	
Week 12	11/23/2015	CT	Fields, D. A., Kafai, Y. B., & Searle, K. A. (2012). Basawapatna, A., et al (2011, March)	
Week 13	11/30/2015	CT		Paper 2 Due Dec. 1
Week 14	12/7/2015	CT		Maker Project Due Dec. 8
Week 15	12/14/2015	CT		

More Helpful Information

Buying Arduino and Other Electronic Goodies:

You can, of course, shop wherever you'd like. However, we do have a 20% discount at sparkfun.com. Just enter the following code at checkout:

EDUPepperdineEtex2015

You will need to have, at minimum, the Protosnap - Lilypad Development Board: https://www.sparkfun.com/products/11262

Beyond that, it's up to you. Make sure you bring your toys to our F2F meetings.

Getting Minecraft:

If you want a discount, you can use your .edu email at minecraftedu.com to buy it for $18.00. You do not need hosting or a server, so just buy the client.

You can always buy the full version for $26.95 at minecraft.net.

We will need this for our first live meeting on 9/10.

I'll post details on Sakai, but the general idea is to meet in Minecraft and have a voice client running in the background to make communicating easier. We will be using a private Minecraft server to meet. I ***highly recommend*** trying to log in before class time from the location where you will do class. Minecraft uses special ports for communication, and a firewall or funky network setup can cause issues for you.

I'm thinking Google Hangouts might be the simplest way to handle voice communication while we are in Minecraft. If someone has a better idea, I'd love to hear it.

From your friends at GSEP

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