

CD 145 / ED 182

Technological Tools for Learning

Spring, 2015

Tuesday 9-11:30am

Location:

Curriculum Lab at the Eliot-Pearson Department of Child Development

Prof. Marina Bers

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COURSE DESCRIPTION

This course explores the design and use of new technologies for learning. The underlying philosophy of this course is "constructionism", which states that people learn better when engaged in making and designing their own computational meaningful projects; therefore, we will become designers of technological tools to be used in education and we will become researchers to assess the thinking and learning fostered by the different tools. We will also explore current research and debates regarding educational technologies.

COURSE REQUIREMENTS

Readings and class participation (On-going--10% of grade): All students are expected to do the readings, and to participate in discussions in class. Most readings will be linked from the syllabus. It is strongly suggested that students print them out and have them available in a folder to bring to class.

Class presentations (On-going--10% of grade): Class time will be organized as discussions, not lectures. To help get discussions started, each session a student will be asked to summarize the readings and suggest one question or provocative issue.

Coding project (Due March 10---20% of grade). Individually students will develop a project using ScratchJr or Scratch and will present it during class.

Development of a robotics curriculum unit (March 24—15% of grade). In small groups students will develop a three-hour curriculum to teach robotics. They will present their proposals to the class for discussion on March 24. Later, they will implement their unit in a classroom and will document the learning.

Classroom implementation of a robotics curriculum unit. (March 31 and April 7 --15% of grade). In small groups students will implement their three-hour curriculum to teach robotics.

Documentation of a robotics curriculum unit. (April 21—30% of grade). In small groups students will document the learning experience and will present their work to the class. The documentation project will include two elements: 1) a short video (less than one minute); 2) a Powerpoint or equivalent) presentation that tells the story of what happened using text, pictures and video by focusing on a particular aspect of the experience.

January 20: Introduction and Course Overview

Readings for Class	<p>Koschmann, T. D. (1996). Paradigm shifts and instructional technology: An introduction. In T. D. Koschmann (Ed.), <i>CSCL: Theory and practice of an emerging paradigm</i> (pp. 1-24). NJ: Lawrence Erlbaum.</p> <p>Papert, S. (1999, March 29). Papert on Piaget. Time Magazine, special issue on "The Century's Greatest Minds,"105</p>
Design Studio	<p>Marina's presentation</p> <p>Class activity with the four paradigms</p> <p>Papert's video</p>

January 27: Programming robots in Kindergarten

Readings for Class	<p>Bers, M. & Horn, M. (2010). Tangible programming in early childhood: Revisiting developmental assumptions through new technologies. In I. R. Berson & M. J. Berson (Eds), <i>High-tech tots: Childhood in a digital world.</i> Greenwich, CT: Information Age Publishing.</p> <p>Bers, M (2011) The TangibleK Robotics Program: Applied Computational Thinking for Young Children Early Childhood Research & Practice (Volume 12, No. 2).</p> <p>Kazakoff, E., & Bers, M. (2012). Programming in a robotics context in the kindergarten classroom: The impact on sequencing skills. <i>Journal of Educational Multimedia and Hypermedia</i>, 21(4), 371-391.</p>
Design Studio	<p>Students will explore KIBO</p>

February 3: Dances around the world

Readings for Class	<p>Ready for Robotics website</p>
Design Studio	<p>Students will work on dancing robots with KIBO</p>

February 10: Learning Programming with Scratch

Readings for Class	<p>Resnick, M., Maloney, J., Monroy-Hernandez, A., Rusk, N., Eastmond, E., Brennan, K., Millner, A., Rosenbaum, E., Silver, J., Silverman, B., & Kafai, Y. (2009). Scratch: Programming for All. <i>Communications of the ACM</i>, vol. 52, no. 11, pp. 60-67 (Nov. 2009).</p> <p>Resnick, M. (2006). Computer as Paintbrush: Technology, Play, and the Creative Society. In Singer, D., Golikoff, R., and Hirsh-Pasek, K. (eds.), <i>Play = Learning: How play motivates and enhances children's cognitive and social-emotional growth</i>. Oxford University Press.</p>
Design Studio	<p>Scratch activity (cards)</p>

February 17: ScratchJr project (Dylan)

Readings for Class	<p>Flannery, L.P., Kazakoff, E.R., Bontá, P., Silverman, B., Bers, M.U., and Resnick, M. (2013). Designing ScratchJr: Support for early childhood learning through computer programming. In Proceedings of the 12th International Conference on Interaction Design and Children (IDC '13). ACM, New York, NY, USA, 1-10. DOI=10.1145/2485760.2485785</p> <p>ScratchJr website</p>
Design Studio	<p>ScratchJr projects</p>

February 24: Visit to classroom I: Iditarod

Design Studio	<p>Iditarod project in first grade</p>
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March 3: Visit to classroom II: Iditarod

Design Studio	<p>Iditarod project in first grade</p>
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March 10: Presentations of Codingprojects

Design Studio	<p>Students will share their Scratch or ScartchJr project Debriefing about Iditarod experience</p>
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March 17: No class. Spring break

March 24 : Curriculum development

Design Studio	Students will work in groups developing their curriculum projects and testing them out
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March 31: Visit to Classroom I: East Boston

Design studio	Robotics project in 4 classrooms
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April 7: Visit to Classroom II: East Boston

Design Studio	Robotics project in 4 classrooms
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April 14: Computational literacy and technological fluency

Readings for Class	<p>Technological Fluency</p> <p>Jenkins, H. et al. (2006). Confronting the Challenges of Participatory Culture: Media Education for the 21st Century. MacArthur Foundation.</p> <p>Technological Literacy standards (ITEA International Technology Education Association)</p> <p>Massachusetts Curriculum Frameworks for Science and Technology / Engineering and Massachusetts Technology Literacy Standards and Expectations</p> <p>Technically Speaking: Why all Americans Need to Know More about Technology (National Academy of Engineering and National Research Council, 2002)</p> <p>NETS (National Educational Technology Standards) Project, ISTE (International Society for Technology in Education)</p>
Design Studio	Students will compare and contrast the ways in which the different documents define what it means to be computer literate.

April 21: Final presentations of robotic projects

Assignment due	Final video and Powerpoint (or equivalent) presentations
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