

Module on Technology and Engineering

Prof. Marina Bers

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Office hours: By appointment

Module Description

This module explores how to create and implement curriculum for young children, with a focus in the use of technology to teach math and science, and the development of technological fluency.

November 14 Introduction and course overview

Papert, S. (1999). [*Papert on Piaget*](#). Time Magazine, special issue on "The Century's Greatest Minds," page 105, March 29.

Papert Video

Prof. Bers Presentation

Design studio: From Scratch to Scratch Jr. (Amanda Strawhacker)

Readings for next week:

Bers, M (2008) "Blocks to Robots: learning with technology in the Early Childhood Classroom" NY: Teacher's College Press (introduction & chapter 1)

Papert, S. (1980). [The Gears of My Childhood](#), *Forward to Mindstorms: Children, Computers, and Powerful Ideas Basic Books* (pp. xviii-xxi).

November 21 Programming in the early childhood classroom

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

Resnick et al [Scratch: Programming for All](#) Communications of the ACM (CACM)

Design studio: Empowering ideas assignment

Students will choose a "powerful idea" in the areas of math, science or technology, that empowered them to think in new ways when they were young. They will write a report describing what is the powerful idea, a personal recount of how they first encountered it, the struggles to grasp it and the tools, people and related ideas that helped them understand it. They will also specify if and how, it relates to the MA curriculum frameworks and the core curriculum.

Readings for next week:

Bers, M.U. (2010). [The TangibleK Robotics Program: Applied Computational Thinking for Young Children](#). *Early Childhood Research and Practice*, 12(2).

December 5 Blocks to Robots

[Early Childhood Robotics Network](#)

Design studio: Dances around the world KIWI curriculum

Assignment

Students will choose a "powerful idea" in the areas of math, science or technology and design a Robotics based curricular module for young students to explore and understand

it. They will use the materials listed below to prepare their curriculum. Those can be found here: <http://tkroboticsnetwork.ning.com/page/tangible-k>

[Robotics Curriculum Planning Sheet & Final Project Planning Sheet](#)

[Robotics Curriculum Template \(editable word doc\)](#)

[Technology & Engineering Integration Starter](#)

December 11 Final Robotics Project

Each student will present his or her final curricular project design and will implement with classmates a short version of it.

December 12, Engineering is Elementary.

Guest speaker Kristin Sargianis, Professional Development Director, Museum of Science Boston