The Missing T & E in Early Childhood STEM: Young Children as Programmers and Engineers

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Two scenarios for playful learning

Playpens

Playgrounds
What is the connection with technology and children?
Many technologies are digital playpens
There are also technological playgrounds …
Playground technologies engage children as:

**Producers vs. Consumers**

Creators
Designers
Researchers
Movie makers
Programmers
Engineers
Problem solvers
Communicators
Robotics

CHERP and KIWI
Let’s make a robot dance the hokey pokey!
The Tangible Kindergarten Curriculum

The engineering design process
(Building)

Computational thinking
(Programming)
The Engineering Design Process

1. Ask
2. Imagine
3. Plan
4. Create
5. Test & Improve
6. Share

This is what we made!
The engineering design process

The scientific method

Identify Problem & Constraints

Ask a question

Brainstorm Solutions

Background research

Construct Hypothesis

Construct Prototype

Test & Evaluate

Experiment

Analyze results & draw conclusions

Redesign

Report results

Communicate Solution
Scratch Jr.
Let’s experience ScratchJr. now!
DESIGNING DIGITAL EXPERIENCES FOR POSITIVE YOUTH DEVELOPMENT

FROM PLAYPEN TO PLAYGROUND

MARINA UMASCHI BERS

OXFORD

BLOCKS TO ROBOTS

LEARNING WITH TECHNOLOGY IN THE EARLY CHILDHOOD CLASSROOM

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