SCALABLE GAME DESIGN

A Computer Science Research Project at the University of Colorado Boulder

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http://sgd.cs.colorado.edu/wiki/Scalable_Game_Design_wiki

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Mission: Reinvent computer science in public schools by motivating & educating all students including women and underrepresented populations to learn about computer science through game design starting at middle school.

Theory	Strategy	Results
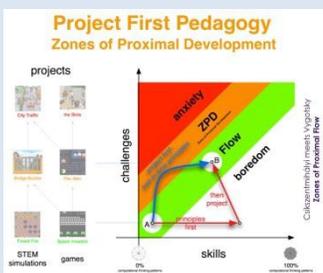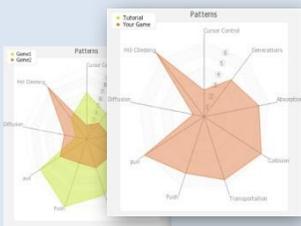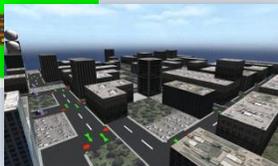
Exposure: Develop a highly adoptable middle school Computational Thinking curriculum integrated into existing computer education and STEM courses *so that* a very large and diverse group of children is exposed to Computational Thinking concepts.
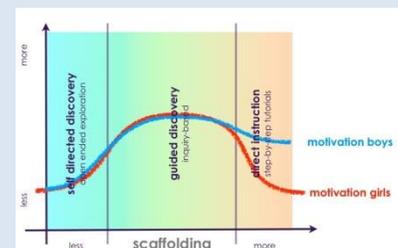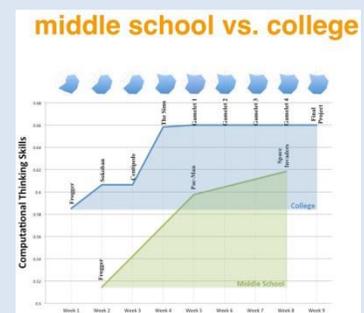
- over **18,000 student** participants in inner city, remote rural, and Native American communities in 6 years
- **43% girls**, 50% underrepresented
- **23 states, 6 countries**: Alaska, California, Colorado, Ohio, Wyoming, Georgia, Ohio, South Dakota, Texas...Brazil, Mexico, Switzerland...
- 74% of boys, 64% of girls (100% for some schools); 69% of minority students want to continue
- used in elementary, middle, high schools, and university level

Motivation: Create a scalable set of game design activities ranging from low threshold to high ceiling activities *so that* students with no programming background can produce complete and exciting games in a short amount of time while still moving on a gradual trajectory to the creation of highly sophisticated games. Computational Thinking Tools used: 2D: AgentSheets; 3D: AgentCubes.

Education: Build computational instruments that analyze student produced projects *so that* learning outcomes can be objectively measured. These outcomes include learning trajectories and transfer of Computational Thinking concepts from game design to simulation building.

middle school vs. college

Project First Pedagogy
Zones of Proximal Development

Pedagogy: Provide teacher development using new pedagogical approaches *so that* teachers can broaden participation. We developed a pedagogical approach that balanced programming skills and challenges in ways that made it possible for students and teachers with no programming background to jump into game design very quickly.

Changing the Game