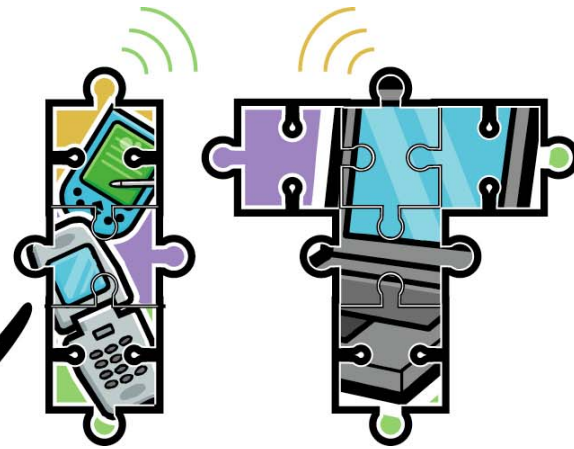


Scaling

Build



**girls
inc.**[®]

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The Noyce Foundation



Piloting Build IT

- NSF ITEST grant to implement Build IT for 3 years (2005-2008) at Girls Incorporated of Alameda County, CA
- Build IT's **Mission:**
Develop a problem- and design-based curriculum that promotes middle school girls' information technology (IT) fluency and incorporates the STEM content of computer science and mathematics.



Build IT's Goals

- Encourage middle school girls to
 - Explore and pursue IT careers
 - Use technology to strengthen and build their technology fluency
 - Take high school algebra and geometry courses in preparation for postsecondary STEM education and/or IT careers
- Enhance GIAC's staff capacity to offer IT fluency programming.



The Partners: SRI's Center for Technology in Learning

- Part of an independent nonprofit founded in 1946 focused on innovation
- CTL's mission is to improve learning and teaching through innovation and inquiry. CTL research, development, and evaluation activities include
 - prototyping new interactive learning environments, materials, and tools, with a focus on STEM learning
 - systematically study and evaluate the outcomes of technology-supported educational innovations
 - develop recommendations and reports for educational leaders.



The Partners: Girls Inc.

- National organization with 1,500 program sites Serves more than 600,000 K-12 girls each year
- Established in the 1800s as sewing circles.
- Today its focus is serving the whole girl with the motto: Strong, Smart, and Bold
- Provides out-of-school experiences: sports, STEM, health, leadership & interpersonal relationships, homework help, career & college exploration



Key Elements of Build IT

- Problem-based curriculum that uses the *Understanding by Design* approach.
- Six units over two years: After school and summer
- Embedded performance tasks for evaluating technology fluency
- Family Tech Nights
- Professional development materials for staff
- Guides for involving IT professionals
- Evaluation instruments for measuring girls' interests and understandings

Successes of the Build IT Pilot

- Girls image of IT careers as solitary and boring have changed significantly to collaborative, fun, and intellectually stimulating
- Girls have increased their technology skills and conceptual knowledge. More girls gained confidence in using computers than comparison group girls
- Girls expressed increased interest in taking mathematics and computer science courses
- GIAC staff have developed greater IT knowledge and skills. All staff members plan to continue Build IT at their sites.



Piloting the Scaling of Build IT

- Starting small: 11 Girls Inc. program sites implement Build IT over two years (2008-2010)
 - 6 Girls Inc. affiliates (8 new program sites) applied and were accepted to participate
 - Continued implementation at the Girls Inc. of Alameda affiliate (3 program sites)
- Funded by The Noyce Foundation & a supplement from NSF

Eight New Program Sites

- Located in the Northeast U.S. and Canada to aid professional development and evaluation:
 - Concord, New Hampshire
 - Nashua, New Hampshire
 - Holyoke, Massachusetts
 - Lowell, Massachusetts
 - Philadelphia, Pennsylvania
 - Hagerstown, Maryland
 - York, Canada (2 program sites)
- Selected based on their ability to support the program and for their diversity as a group
- Small stipend for participating (\$10,000 per program site over two years.)



Criteria for Participation

- All program sites have
 - High-speed Internet access and one computer for every two to three girls.
 - Resources to implement at least 60 hours of the curriculum during the school year plus the 2-week summer program. Sites will consider implementing all 240 hours of the curriculum.
 - Staff who are willing to learn technology and design through participation in Build IT professional development and have a commitment to implementing the Build IT curriculum.
 - Implemented Girls Inc. Operation SMART® (Science, Math, and Relevant Technology) for a minimum of 1 year.



Diversity Among Program Sites

- Rural vs. urban
- School vs. center
- Demographics (range from 6% to 98% minority; more than half have at risk populations)
- All of the curriculum vs parts of the curriculum
- Time of year and duration (concentrated weeks vs. after school)

Keys to Successful Scaling & Sustainability

- Partners
 - Have infrastructure to support the ongoing implementation (staff, resources, organizational memory)
 - Build staff capacity for STEM from the start
 - Develop program ownership (nationally and locally)
- Develop capacity for ongoing professional development
- Plan for ongoing support beyond initial funding
- Include embedded and explicit assessment and evaluation tools



Partnership

- Girls Incorporated of Alameda County
 - Resource for program sites implementing Build IT
 - Co-lead PD
- Girls Incorporated's national office
 - Can provide ongoing PD
 - Contact and resource support for affiliates (the pilot sites and beyond)
- SRI International
 - Initial PD to affiliates staff. Train-the-trainer model
 - Curriculum completion and support
 - Formative evaluation
 - Development of Program Adaptation Toolkit

Professional Development

- Two face-to-face two-day PD sessions (January and November 2008)
- Eight web casts; 4 per year
- Online community (Tapped In) for leaders and participants to help each other; moderated by Girls Inc. and SRI.
- Opportunities at regional conferences led by Girls Inc. national
- Girls Inc. training manager main contact



Program Adaptation Toolkit

- Interactive online toolkit that introduces new users to the curriculum and provides supporting materials for ongoing implementation needs.
- The Toolkit will include
 - a self-assessment of readiness to implement Build IT
 - program support suggestions (e.g. funding)
 - scenarios based on site contexts (e.g. rural vs. urban)
 - PD guides and contacts for nationally run PD
 - evaluation tools.

Ongoing Support

- Girls Incorporated partners are key
 - Part of Girls Inc. national's successful approach of scaling and sustaining STEM programs.
 - Prestige within Girls Inc. to be a curriculum pilot site. Provide guidance to other sites.
 - Individual sites and Girls Inc. national can seek necessary funding
- SRI International
 - Not involved in day-to-day
 - Provide curriculum, assessment, and professional development infusions
 - Make connections to IT professionals



Assessment

- Embedded assessments 'performance tasks' that show girls, staff, parents, and the community what girls know and can do.
- Assessments that focus on girls' learning, not just engagement and overall program success.

Performance Tasks in Build IT

	Performance Task	Type	Activity	Concepts & Skills	Staff Rating (High, Med, Low)
Unit 1 Redesigning Your World					
	Presenting Your Perfect Hangout	Feedback & Culminating	Design a room	Design is a process; User needs	High
	Family Tech Night	Culminating			High
Unit 2 Design Online					
	Post it here!	Feedback	Blogs; Online groups	Form & function; Internet structure	All medium, except Family Tech Night is high
	Linking to You	Feedback			
	Blogs vs. Groups	Culminating			
	Family Tech Night	Culminating			
Unit 3 Redesigning the Web					
	Deciphering an HTML Page	Applying what you've learned	HTML; Website	Engineering conventions; Algorithmic thinking	Low
	Presenting Your Website	Feedback & Culminating			High
Unit 4 Designing the Network					
	Designing a Network	Feedback & Culminating	Network devices and technologies	Computer size; Network structure	Low
	Family Tech Night	Culminating			High
Unit 5 Collaborative Game Design					
	Putting the Game Together	Feedback & Culminating	Object-oriented programming; Game design	Collaboration; Leadership; Troubleshooting; User needs	Med
	Presenting the Game	Culminating			High
	Family Tech Night	Culminating			High
Unit 6 The Web Team					
	Presenting to the Client	Feedback & Culminating	Website	Collaboration; Leadership; User needs	High



Evaluation

- Goals:
 - Discover how girls' attitudes and knowledge are changing
 - Understand implementation in different contexts
 - Analyze staff capacity and identify support needs
 - Provide feedback on scaling efforts to Girls Inc., GIAC, and SRI as well as Girls Inc. staff at each site
 - Share findings with STEM community
 - Long term: Girls Inc. can use these tools and assessments to inform their local programs and collect nationwide data on Build IT
- Three types of evaluation:
 - Summative
 - Formative
 - Self-evaluation

Summative Evaluation

- Led by HTA
- Methods:
 - IT Attitudes Survey
 - IT Concepts Survey
 - Interviews with SRI, Girls Inc. staff, and affiliates

Formative Evaluation

- Led by SRI, with local evaluators for each affiliate site (graduate students)
- Centered on an implementation rubric outlining high-, medium-, and low-quality implementation (based on experiences at GIAC)
- Methods:
 - Observations of sessions
 - Interviews with girls
 - Interviews with Girls Inc. staff (coordinated with summative evaluation interviews)

Self-evaluation

- Led by Girls Inc. staff at each site
 - Each site determines how much and what kind of self-evaluation will serve their needs
- SRI-created set of self-evaluation tools:
 - Professional development post-training surveys
 - Observation protocols for girls' learning and staff capacity
 - Coordinator/leader planning check-in form
 - End-of-unit reflection form
 - Implementation rubric

Research Questions

- Is the Build IT curriculum adoptable and adaptable in different settings? How is the curriculum adapted to work effectively in different settings?
- Are girls engaged, achieving IT fluency, and interested in pursuing IT careers, including taking high school mathematics and computer science courses necessary to pursue these careers?
- Is the Build IT curriculum sustainable in different settings?
- Is staff capacity at each site increased and supported in order to offer this IT fluency programming?

Findings

Is the Build IT curriculum adoptable and adaptable in different settings? How is the curriculum adapted to work effectively in different settings?

- Sites are adopting and adapting the curriculum: amount of adapting varies. Adaptations are due to time constraints and compatibility with existing programs.
- Expected struggles by sites:
 - focus on the activity of “making things” rather than enduring understandings and what girls are learning
 - finding and scheduling IT professionals
 - implementing the mathematics activities

Findings

Are girls engaged, achieving IT fluency, and interested in pursuing IT careers, including taking high school mathematics and computer science courses necessary to pursue these careers?

- Girls are engaged with the Build IT curriculum.
 - Staff member in Lowell: The girls looked forward to Build IT every week, frequently asking me what they'll be doing in Build IT.
 - In York, as girls were putting their finishing touches on their Perfect Hangout, an evaluator overheard a girl telling her partner, "You know a program is good when no one wants to stop."



Findings

- Girls are increasing their IT fluency.
 - For sites that implemented Units 2 and 3, staff members indicated that girls increased their IT fluency.
 - The summative evaluation also showed that girls at GIAC, Philadelphia, Holyoke, and Lowell had greater confidence with technology and increased their IT concept knowledge.
- Taking mathematics and computer science courses.
 - Staff need to focus on this topic more with girls.
 - In York, staff members reported that after Unit 1, girls started embracing the fact that they need technology to achieve a career that they want. The IT professionals “really opened their eyes for college plans.” Staff said that the girls asked about college courses and started to identify the careers that they might be interested in and develop a more realistic view of the jobs.

Findings

- Interest in IT careers.
 - Girls perceptions of these careers are changing towards the positive based on their experiences in Build IT.
 - So far there is not a significant change in girls desires to pursue these careers for themselves.



"I could really work here. I'm learning codes now, and I'm this little, by the time I'm in high school I can be here working on their site making it better!"

— Build IT participant's remarks on field trip to LeapFrog



Findings

Is the Build IT curriculum sustainable in different settings?

- All participating sites are now implementing Build IT for a second or third time.
- We are still gathering information on the effectiveness of the train the trainer model for Build IT.
 - Curriculum implementation information is transferred from staff who participated in the professional development to those who did not.
 - An important sustainability factor since new staff are asked to implement the curriculum.
- Also, still checking on the organizational fit and memory!

Findings

Is staff capacity at each site increased and supported in order to offer this IT fluency programming?

- Staff members at Girls Inc. sites are taking advantage of professional development offered by the Scaling Build IT project, indicating that they are learning the curriculum and how to implement it at their sites.
- Staff members are showing early signs of developing their own internal network of support at their sites for ongoing implementation.
- Staff members at the sites are also turning to their colleagues at other sites for support.



Discussion

- Any comments on the Build IT approach to scaling?
- Scaling your project
 - Where are you in the scaling process?
 - What models for scaling are you using?