

# "Effective Strategies for Working with Girls in Science, Technology, Engineering, and Math"

National  
Girls  
Collaborative  
Project  
Webcast

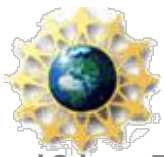
*Hosted by  
Education  
Development  
Center, Inc.*

Wednesday November 14, 2007

11 am (PST), 2 pm (EST)

*This Webcast will begin at the top of the hour.*

For assistance, e-mail:  
[help@learningtimes.net](mailto:help@learningtimes.net)



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# National Girls Collaborative Project

The National Girls Collaborative Project (NGCP) brings together organizations that are committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).

[www.ngcproject.org](http://www.ngcproject.org)

## Regional Collaboratives

California [www.ngcproject.org/california](http://www.ngcproject.org/california)

Florida [www.ngcproject.org/florida](http://www.ngcproject.org/florida)

North Carolina [www.ngcproject.org/northcarolina](http://www.ngcproject.org/northcarolina)

Northwest [www.ngcproject.org/northwest](http://www.ngcproject.org/northwest)

*Collaborative Project*



# Project Goals

1. Maximize access to shared resources within projects and with public and private sector organizations and institutions interested in expanding girls' participation in STEM.
2. Strengthen capacity of existing and evolving projects by sharing promising practice research and program models, outcomes and products.
3. Use the leverage of a network or collaboration of individual girl-serving STEM programs to create the tipping point for gender equity in STEM.

# Strengthening Capacity

The NGCP will disseminate Research Based Strategies to strengthen the capacity of girl-serving organizations to provide high-quality informal learning environments for girls in STEM and to effectively evaluate and assess their efforts.

## Our partners

- Education Development Center (EDC)
- Assessing Women and Men in Engineering (AWE)

## Our methods

- Webcasts
- Collaborative events
- Resource collection on NGCP website

# National Girls Collaborative Project Webcast

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## Engaging Girls in STEM: What Works?

Sarita Nair-Pillai  
Co-PI, ITEST Learning Resource Center &  
Project Director, Education Development  
Center



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# From Research to Practice

- Mentoring
- Experiential learning
- STEM career perceptions
- Importance of 21<sup>st</sup> century skills
- Fostering persistence
- Creating a culture of high expectations



# Mentoring

- Relationships and career development
- Peer and near-peer mentoring, families, exposure to women STEM professionals
- Use local/community resources
  - Local high school students, undergraduate students, teacher groups, and local chapters of professional societies
  - Local corporations with a strong community presence
  - Corporations having women's initiatives



# Experiential Learning

- Contextual STEM experiences that connect the subject matter to the real world
- Embedding STEM concepts into meaningful cultural and human contexts
- Project-based learning and scientific inquiry
- Linking formal and informal learning strategies



# Positive Perceptions of STEM Careers

- Making a difference
- Impact on society
  - Environment, helping others, etc
- Not solitary occupations
- Combating the 'geek' factor



# 21<sup>st</sup> Century Skills

- Not just about academics
- Variety of skills needed in the workplace
- Quality STEM content + technical skill + exposure to 21st century skills. For e.g.,
  - Critical thinking and problem solving
  - Communication, collaboration and social skills
  - Creativity
  - Flexibility and adaptability
  - Leadership



# Fostering Persistence

- Developing an overall sense of self-efficacy
  - Parental buy-in
  - Appreciation of girls' individual identities
  - Dispelling myths and gender stereotypes about their capabilities
  - Maintaining open communication about all these issues



# High Expectations

- Begin program design with the assumption that girls can and will excel
  - Reinforce this message continually
  - Design programs that are compensatory and intentional about battling negative stereotypes
  - Allow girls to make big and interesting mistakes
  - Provide a 'safe', supportive and judgment-free environment in which to succeed and fail



# Examples of Supporting Research


- Madill, H., Ciccocioppo, A., Stewin, L., Armour, M., Montgomerie, T. (2004) "The Potential to Develop a Career in Science: Young women's issues and their implications for career guidance initiatives." *International Journal for the Advancement of Counseling*. 26 (1).
- New Formulas for America's Workforce, 1 & 2. (2003, 2006). "Girls in Science and Engineering". National Science Foundation. Research on Science and Engineering Program (EHR/HRD).
- Fadigan, Kathleen A., Hammrich, P. (2004). "A longitudinal study of the educational and career trajectories of female participants of an urban informal science education program." *Journal of Research in Science Teaching*. 41 (8).
- Taylor, V.S., Erwin, K.W., Ghose, M., Perry-Thornton, E. (2001). "Models to increase enrollment of minority females in science-based careers." *Journal of the National Medical Association*. 93 (2).
- Encouraging Girls in Math and Science. (2007). Practice Guide. Institution for Education Sciences. National Center for Education Research. U.S. Department of Education.
- Thom, M. (2001). "Balancing the Equation: Where are the girls in Science, Engineering and Technology?" The National Council for Research on Women.



# **Girl Game Company**

**Jill Denner**

Funded by a grant from the National  
Science Foundation to Education,  
Training, Research (ETR) Associates



# Program Details

- 80 girls will participate over three years
- weekly during the school year, and daily for three weeks in summer
- part of the extended learning program
- goal: to increase girls' interest, capacity, and motivation to pursue a career in information technology

# Who are the girls in Girl Game Company?

- Live in a rural community in central California
- Middle school students
- Most are Latina (Mexican); mix of first and second generation
- Range of computer experience & access

# Origin of Strategies

- previous research
- lessons learned in the Girls Creating Games program (GCG): lesson plans, program guides, girls' games, and publications list from GCG are at:

<http://psweb.etr.org/gcgweb/public/games/index.html>

# Strategy #1

*Use instructional approaches that research and program staff persons say will appeal to girls:*

- project-based design-based learning (a product that others will use)
- digital game design (a game that is fun and helps others)
- collaborative learning (pair programming and teamwork)
- only female participants

## Strategy #2

*Expose girls to career paths in digital game design and the tech industry:*

- work in a game company department (production, public relations, human resources)
- field trips to universities and tech companies (Google, Electronic Arts)
- dispel negative stereotypes about the IT workforce (identity exploration in the context of family obligations)

## Strategy #3

*Increase girls' network of support to pursue IT careers and classes:*

- virtual and real role models (college students and computer engineers)
- contact with tech savvy peers (through Whyville.net)
- family involvement (internet safety and career options)

# Questions

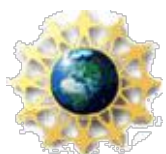
- Do these strategies apply to a generation that has grown up with technology?
- Are these strategies relevant to all girls?
- Which of these strategies could be applied in a classroom?

# girlstart

- Mission
- Delivery Method
- Programs
  - Club Girlstart
  - Saturday Camps
  - Summer Camps
  - IT Girl



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# PROJECT IT GIRL '09

make your mark

- Goals
- Participant Demographics
- Year 2 Project



# Engaging Girls in STEM

- Career Exploration
  - Expert Interviews & Guest Speakers
  - Field Trips
- Modeling
  - Professional Female Volunteers
  - Program leaders
- Mentoring
  - High-tech community
  - Multi-generational



# Additional NGCP Information

## Program Directory

[www.pugetsoundcenter.org/ngcp/directory/index.cfm](http://www.pugetsoundcenter.org/ngcp/directory/index.cfm)

## Join the NGCP listserv

[www.pugetsoundcenter.org/ngcp/resources/newsletter.html](http://www.pugetsoundcenter.org/ngcp/resources/newsletter.html)

## Upcoming Webcasts

- Tools for collaboration success: National Girls Collaborative Project mini-grants  
December 12, 2007 11:00-12:00 Pacific Standard Time
- Programming for girls in STEM: Lessons from the field  
January 9, 2008 11:00-12:00 Pacific Standard Time