



## COMPUGIRLS, Culture, & Formative Evaluation: Lessons Learned

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[www.compugirls.asu.edu](http://www.compugirls.asu.edu)

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By grade 8, girls possess less positive perceptions of computers than boys **WHY?** (Christensen, Knezek, & Overall, 2005).

Low-income African American, Hispanic American, and Native American students have less access to advanced information and communication technology ( ICT ) in their homes or schools than their White counterparts (Kaiser Family Foundation, 2004; Goode & Margolis, 2004; Margolis et al, 2008).

Programs are boring and culturally irrelevant (Werner, Denner, & Campe, 2006; Scott, 2005; Eisenhart & Edwards, 2004), yet STEM enrichment has potential for girls (Scantlebury & Baker, 2007)



# Theory to Practice

## Theoretical Foundation

### I. *Culturally Responsive Practices:*

- a. *Reflective Action* (Gay 2000, 2002; Howard, 2001, 2003; Villegas & Lucas, 2007; Lee, 2007)
- b. *Asset Building* (Hilliard, 2003; Howard, 2001; Lee, 2007; Ladson-Billings, 1995)
- c. *Connectedness* (Delpit, 2006; Gay, 2000; Howard, 2003; Ladson-Billings, 1995; Lane, 2006)

### II. *Social Justice Youth Development Framework* (Ginwright & Cammarota, 2006)

### III. *Future Time Perspective* (Malka & Covington, 2005; Lang & Cartensen, 2002; Husman & Lens, 1999; Zimbard & Boyd, 1999)

## COMPUGIRLS' Practice

### I. Culturally Responsive Computing:

- a. Mentor Teachers (COMPUGIRLS' Instructors) *reflect* about girls' of color technological capacities.
  - a. Curricula *build* upon girls' community, technology, and topic-matter expertise
  - b. Technology is a means to establishing and maintaining peer connections that advance community
- ### II. Technology used to research social/community issue to ultimately advance community

### III. Provide ICT models and pathways

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# COMPUGIRLS!

Started in AZ Summer 2007  
Summers & Afterschool  
Cohort-based

Program for adolescent  
(grades 8-12) girls from  
under-resourced school  
districts

Social Justice Technology  
Program integrating CRC

Year II-NSF ITEST



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## COMPUGIRLS' OBJECTIVES

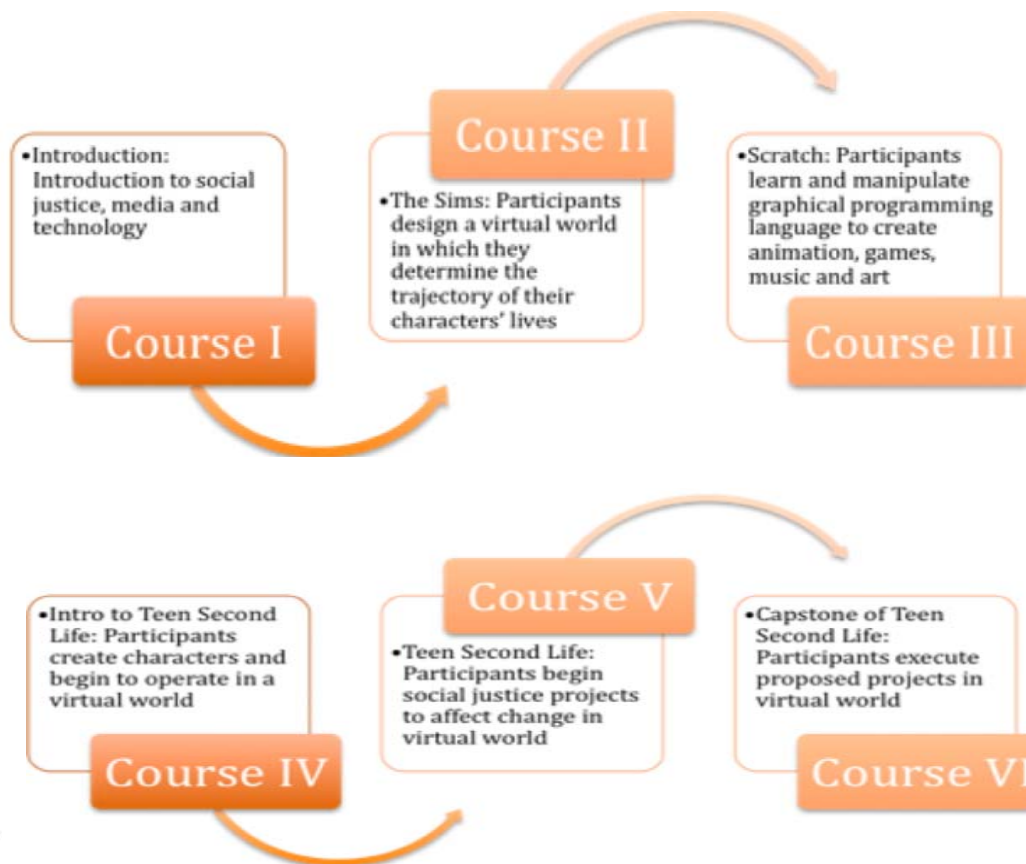
- To use multimedia activities as a means of encouraging computational thinking
- To enhance girls' techno-social analytical skills using culturally relevant practices
- To provide girls with a dynamic, fun learning environment that nurtures the development of a proactive self-concept



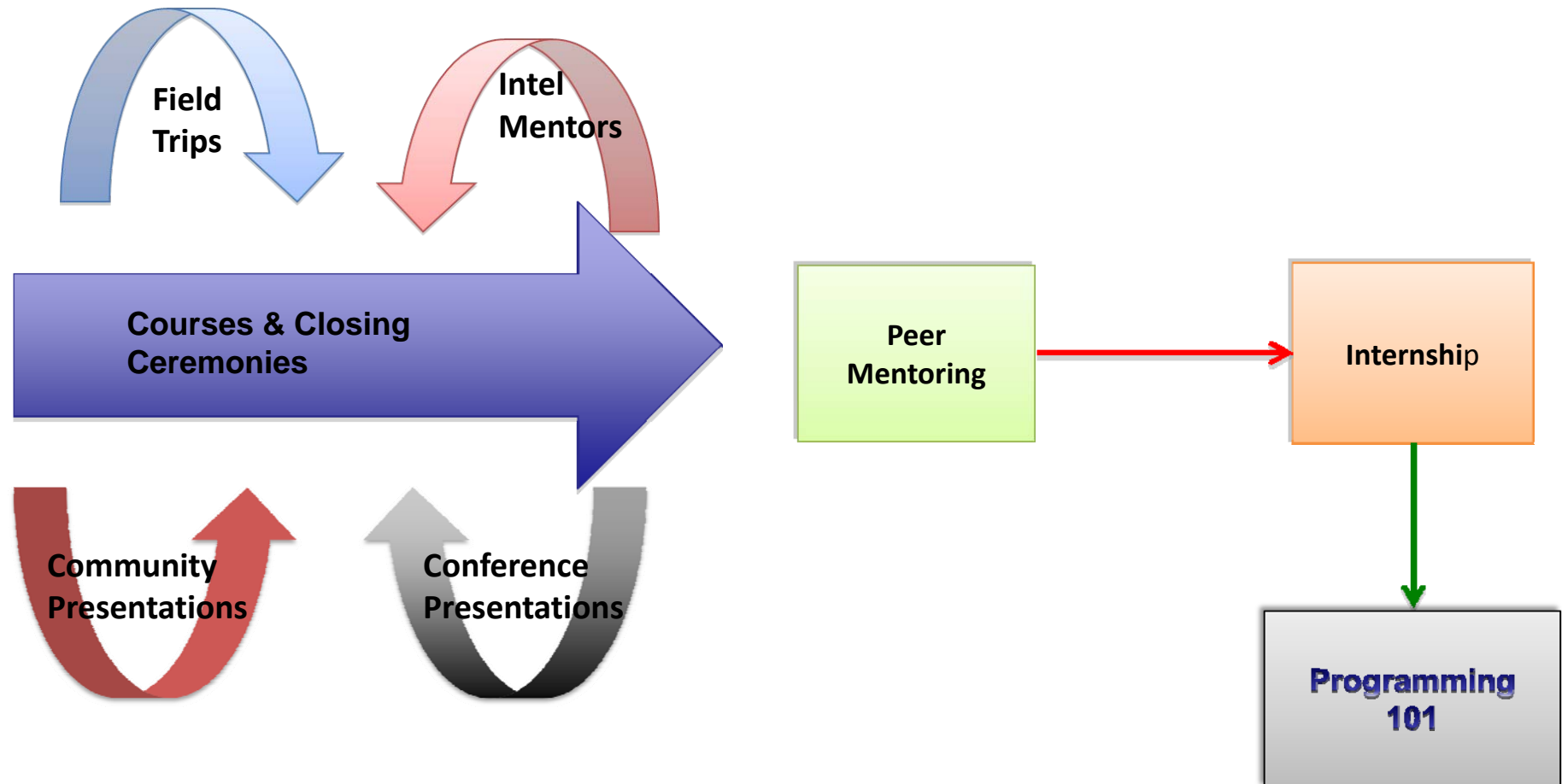




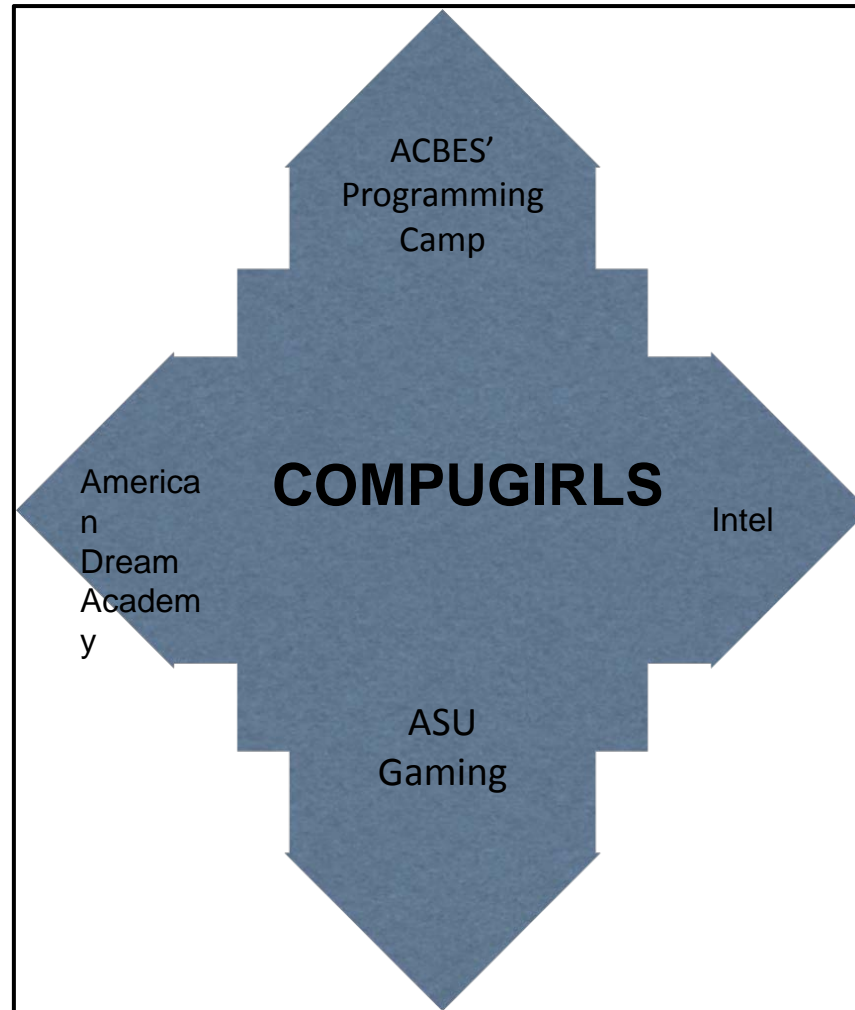
# COURSES



## Program of study



# Partnerships





# SITES



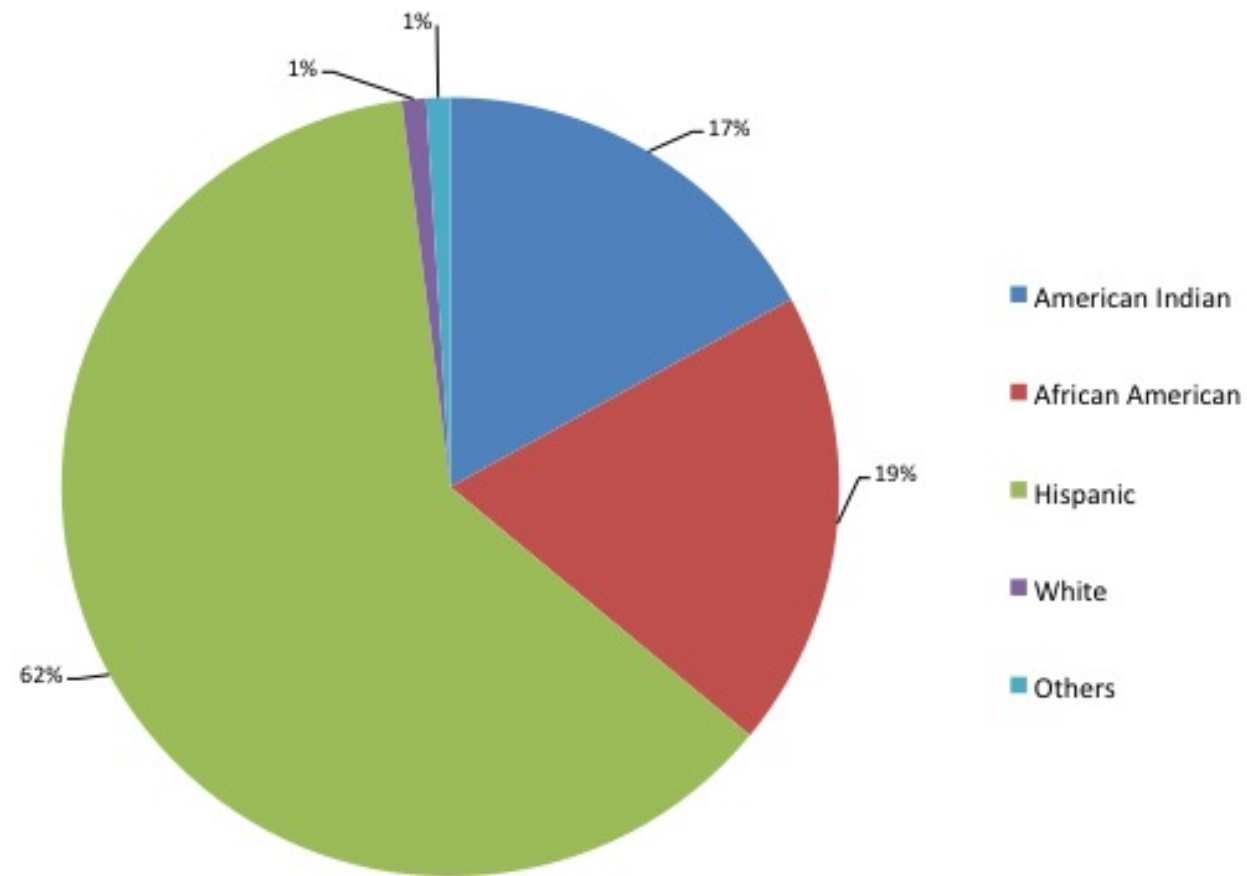
- Started in Summer 2007
- Mostly Hispanic and African American Girls
- Collaboration with Phoenix Union High School District, Roosevelt El., Tempe Union HS



- Started in Summer 2009
- Native American Girls: O'Odtham
- Collaboration with Boys and Girls Club
- Unique collaboration with the Gila River Indian Community*



# PARTICIPANTS



# MENTOR-TEACHERS

Both ASU Graduate Students and  
In Service Teachers from  
School Districts

Given Opportunity to Enhance  
their Academic and Research  
Knowledge and Experience

Intensive Training:

- ✧ Graduate Level Class
- ✧ 12-hours training per  
course
- ✧ Pairing
- ✧ Curriculum and  
Technology Coaches





# Highlights





## CANCER MULTIPLE MYELOMA

The video in Dr Scott's presentation can be found from the following link :

<http://www.youtube.com/watch?v=ne2iyzaEqJ0>



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# Original Project Evaluation (ASU Site)

Goal	Measurement Strategy
COMPUGIRLS participants will experience a change in their motivation for and engagement in <b>academic skills</b>	<ul style="list-style-type: none"><li>- Possible and Plausible Selves</li><li>- ASDQ (academic subscale)</li></ul>
COMPUGIRLS participants will experience a change in their <b>technological skills</b>	<ul style="list-style-type: none"><li>- Computer Interface Literacy Measure (CILM)</li></ul>
COMPUGIRLS participants will experience a change in their motivation for using and learning Technological skills	<ul style="list-style-type: none"><li>- ASDQ (technological subscale)</li></ul>
COMPUGIRLS participants will experience a change in their <b>self worth</b>	<ul style="list-style-type: none"><li>- ASDQ (Stable Personal Preferences)</li></ul>
COMPUGIRLS participants will experience a change in their <b>future self-perception</b>	<ul style="list-style-type: none"><li>- Possible and Plausible Selves</li></ul>



# Original Evaluation Plan

- To identify the combination of factors presented in the program design, a hierarchical regression model will be used to estimate change over time. Expected individual outcomes include increased:
  - Academic skills
  - Technological skills
  - Self-perceptions

# Original Evaluation Plan

$$\text{Level-1: } Y_{ti} = \pi_{0i} + \pi_{1i}X_{ti} + e_{ti} \quad (1)$$

Where:

$Y_{ti}$  = the outcome measure at time  $t$  for individual  $i$

$\pi_{0i}$  = the growth rate for individual  $i$

$\pi_{1i}$  = the ability of individual  $i$  at  $X_{ti} = 0$

$X_{ti}$  = the value of the predictor at time  $t$  for individual  $i$

$e_{ti}$  = error, which is normally distributed with a mean of 0 and constant variance

# Original Evaluation Plan

$$\text{Level-2a: } \pi_{0i} = \beta_{00} + \beta_{01}W_i + r_{0i} \quad (2)$$

$$\text{Level-2b: } \pi_{1i} = \beta_{10} + \beta_{11}W_i + r_{1i} \quad (3)$$

Where:

$W_i$  = an individual-level variable/predictor;

$\beta_{00}$  and  $\beta_{10}$  = the second-level intercept terms (fixed effect);

$\beta_{01}$  and  $\beta_{11}$  = the slopes relating  $W_i$  to the intercept and the slope terms from the Level 1 equation (fixed effect);

$r_{0i}$  = the Level-2 residuals;

Group 1: CompuGirls

Group 2: Social Justice (only)

Group 3: Technology (only)

Group 4: No treatment

# Original (Qualitative) Evaluation

## Guiding Questions

- 1) To what extent does the program meet its goals?
- 2) What specific aspects of the program create a change in attitudes, behaviors, and skills related to social justice awareness and STEM interest and aspirations?

Interviews and observations will be used to address these questions.

# Current Methodology

	<b>Dependent Measure</b>	<b>Covariate</b>
CG	Summer post	Summer pre
Control	Fall post	Fall pre

- ANCOVA
- Paired sample, t-test

# Current Methodology

	<b>Dependent Measure</b>	<b>Covariate</b>
CG	Fall post	Summer pre (all)
Control	Spring post	Fall pre

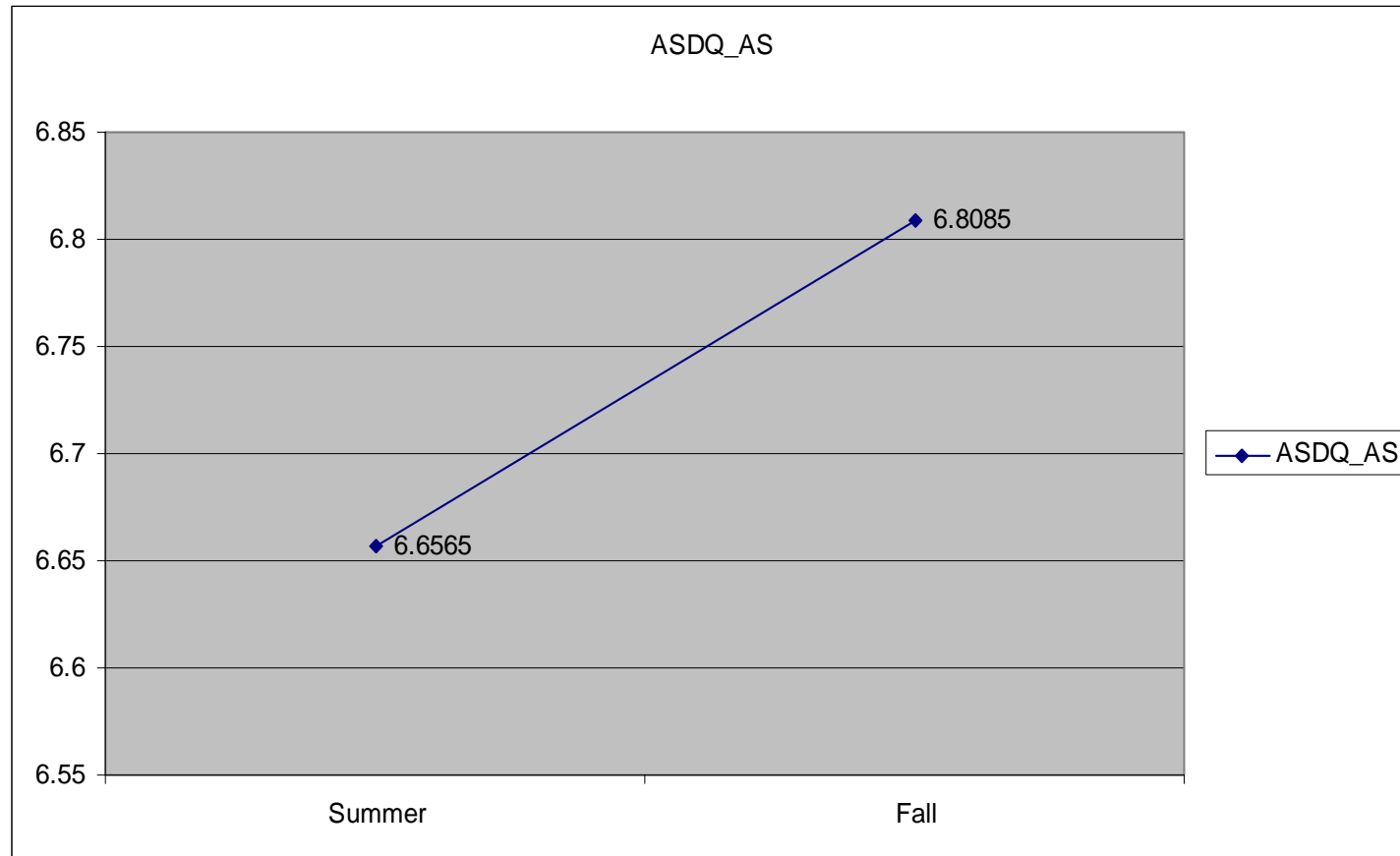
- Possible year-end analysis
- Continued qualitative sources



# Early Results

- Wild levels of enthusiasm
  - Students
  - Parents
  - Program staff
- Some programmatic glitches (parking, food)
- Ability to define social justice
- Strong relationships

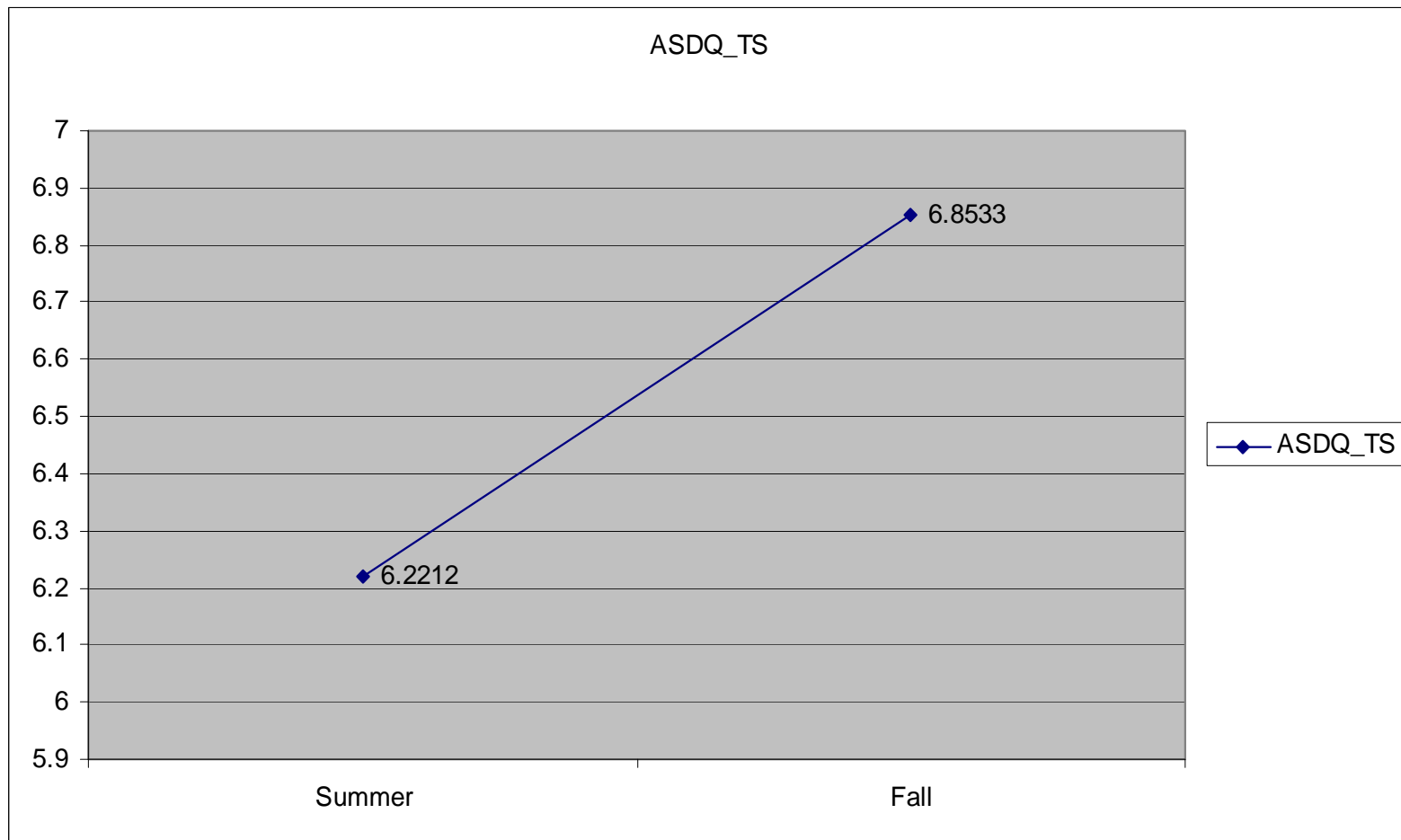
# Early Results



$p < .01$

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# Early Results



$p < .01$

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# Summary/Questions

- Social Justice+Technology+CRC=Increased enthusiasm and interest in STEM/CS careers
  - Technology as a means to community advancement
- Formative Evaluation Results promising in *some areas*
- Gender Equity needs to consider other variables than gender alone

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