A Pre-College Professional Development Program

ITiCSE 2011
June 28, 2011

Steve Cooper  Wanda Dann
Susan Rodger  Pam Lawhead
RoxAnn Stalvey  Dan Lewis
Madeleine Schep
Outline

- Project description
- Results
- Lessons learned/Advice for others
- Future work
This material is partially based upon work supported by the National Science Foundation under Grant Numbers 0624654, 0624642, 0624528, 0623808, and 0624479. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Partial support from IBM Faculty Awards

CRA-W has also supported summer students
Project Description

NSF ITEST program

K-12 teacher professional development track

- 120 contact hours in summer
- Teachers then incorporate what they have learned into their classes
- Teachers develop lesson plans
Project Description

- Pilot in Virginia Beach, VA.
  - With high school teachers

Implementation in
- North Carolina (middle school, 10-13)
- South Carolina (high school, 13-16)
- Mississippi (middle and high school)
- San Jose, CA. area (high school)
- Colorado (high school)

Some sites focused on computing/programming teachers, and others integrated Alice into other disciplines
Project Description

Summer
- One week Alice content
- One week curriculum development
  - Pedagogy
  - Mapping to state standards
- One week teaching a summer camp*

Academic year support

Following summer wrap up

* The Duke Youth program has started an Alice camp and hired teachers that went through this workshop to teach it
Project Description

https://www.aliceprogramming.net/ITEST
(scooper/brillig) to access

Population:
- > 100 teachers
- Several thousand students

IRB issues
Results

Strong pilot results (published in SIGCSE 2010)
- 3x students taking intro programming
- 3x students taking AP CS course
- 0 - 20% women in AP CS course
- 20% minorities

Other states
- Strong results with respect to teacher changes
Lessons learned

Differences in background among high school teachers

- Weaker backgrounds
  - Business Certification
  - Emergency certifications

- Stronger backgrounds
  - Math
  - Science
Lessons learned

Difference in backgrounds between middle and high school teachers

Teachers’ previous programming experience (or lack thereof)
Lessons learned

Need to involve school IT directors
- Principal support wasn’t enough

Need for school-year support
- Actual details varied widely between sites
- Creating a community of practice – regular meetings to share successes and failures

Problems in Colorado
Lessons learned

A forum to showcase teacher work
Duke Summer 2009 symposium

Need for a repository of teaching materials created by the teachers

Other difficulties with the economy: teachers cut, computer labs cut, courses cut, etc.
Lessons learned

Where does computing fit?
- In middle school
- In high school
  - Career and Technical Education versus College-bound
  - Challenges of varied student background

A partnership between college and pre-college instructors
The future

Scaling up our project

- 5 years of funding
- Three week workshops every summer
- Another Alice Symposium bring together teachers from all 3 states

Any interested teachers from NC, SC, and/or MS?
Questions?

http://www.cs.duke.edu/~rodger/baking/cs.html