DIGITAL INNOVATION GENERATING NEW INFORMATION TECHNOLOGY

University of Idaho
Coeur d’Alene

Digital Innovation Summer Camp for Girls
July 22-26, 2013

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http://www.youtube.com/watch?v=CvOo21RsCCU&feature=youtu.be

Embed Video Here
PURPOSE

• By 2020, five of the top 10 in-demand jobs in the United States will be in Information Technology (Moeller, 2012).

• Companies across the nation are seeking a new type of employee; one that is computer savvy, familiar with computer coding, data, and augmented reality (Leber, 2013).

• The importance of technology and related careers is a key economic concern for individuals in Idaho.

• One respondent in a recent Post Falls survey noted, “Our economy depends on technology and innovation” (Storrs, Hormel. & Mihelich, 2012, p. 23).

• Parents throughout Idaho support increases to STEM education and acknowledged that more attention should be given to technology.
• Students in Idaho are interested in jobs in STEM fields,

• Between seventh and tenth grade, girls’ positive attitudes toward mathematics and science drastically declined and their interest in careers involving mathematics and science decreased drastically as well (Idaho, 2013).

• Girls’ attitudes “diminished at a far more substantial rate than for boys,” highlighting the need to focus on girls and STEM disciplines (Idaho, 2013, p. 26).

• This gender difference is even present with adults;
  • Data from Post Falls indicate that 27% of adult men and only 6% of women feel “very informed” about technology, therefore exacerbating the ever-present gender gap with respect to technology.
Project Overview: Aimed at increasing digital literacies and promoting technological careers for middle and high school girls.

High School Internship: Five high school interns (June 17-August 2, 2013).
- familiarized with technologically related careers
- interned with local start-up companies
- engaged in specific uses of technology such as computer coding and programming.

Middle School Camp: Twenty-seven middle school girls (one week)
- Computer coding and digital literacies
MIDDLE SCHOOL CODE CAMP

- 27 Middle School Girls
- Mornings programming with Scratch
- Afternoons activities and programming with Alice
- Ended with a Showcase Celebration for family, friends and sponsors

- Goals: Fun, Educational
SCRATCH (SCRATCH.MIT.EDU/)

Free, on-line or stand-alone

Sprite Based

Drag and drop, graphical programming language
SCRATCH PROS AND CONS

Free
Simple syntax
Very graphical
Easy to add media: draw sprites and backgrounds, add images and sound, etc.
Maintains a studio of projects for each user
Large on-line community emphasizing sharing and “remixing”

Can’t build “real” programs
Limited to 2D graphics
Limited data structures and advanced computing concepts
CODE CAMP

Worked in teams
Built two projects:
  Scene – Multiple, interacting sprites
  Game – Moon lander, dodging/catching falling objects, etc.

Students added to generic scripts/programs

General structure
  10-20 minutes of “lecture”
  10-20 minutes of the project time (timed)

Repeat

Showcase Celebration – presentations of their projects
“LESSONS”

Basics of programming
  Loops, variables, conditionals, input/output

Mathematics
  Cartesian coordinates, vectors, simple equations,
  multi-dimensional thinking (x, y, time)

Physics
  Position, velocity, acceleration, gravity

Engineering
  Designs and design decisions,
EXAMPLE - SCENE

Sprites A and B move to meet

Design choices:
Use vectors: turn $a$, forward $p$
Use Cartesian coordinates: glide to $x,y$
How long should it take? Will they arrive at the same time?
STUDENT SCENE
EXAMPLE - LANDER

Ideas:

- Vectors
- Position, velocity, acceleration
- Gravity
- Variables
- Conditionals
- Input
- Modular designs/solutions
STUDENT GAME

How to Play

- To move on to the next level you must make the diver touch the starfish.
- Watch out for the bubbles! If the diver touches them, you will have to start over at the beginning of that level.
- Control your diver using the arrow keys.
- To start the game, make the diver touch the starfish.
STUDENT GAME
WHAT WORKED (AND DIDN’T)

• Scratch worked well
• Projects appealed to the students
  • Joke scenes, dance videos, complex games
  • Students chose which to focus on
• Programming concepts were well understood
• Celebration showcase was a positive motivator
• Teams worked well together
• Lots of short “lectures” and short blocks of coding time kept students interested
• Needed a more formal design process
• More incorporation of external media (images, sounds, etc.)
• Non-coding concepts may not have been as well understood
• Need method to track and encourage on-going/post-camp projects
RESOURCES

Scratch (scratch.mit.edu)
  On-line tutorials
  Shared projects
  Remixing

http://www2.cs.uidaho.edu/~tsoule/ (Dig’n IT link)
  Sample projects

Contact me (tsoule@cs.uidaho.edu) for lesson plans
INTERNSHIP
My Internship Experience

By: Darcy Green
Overview of my summer

- Took pictures
- Business Tours
- Worked side by side iShoutOut
- Helped run a middle school girls camp
- Much more
2030 Vision
iShoutOut

- Learned more about graphic design
- Tried out new things
- Going on a sales call
- Connections are a big thing to help out the community.
Business Tours

- Inland Learning
- Triple E Technologies
- Auto ID Specialties
Dig n’ IT Camp

It was a great time being with the kids and seeing what all they could do. This was a great thing that should be continued in the next years to come.
Meaningful Experience

The most meaningful experience I encountered was being a mentor to the middle school girls.
Top 3-5 Things I learned

- There are many things beyond my view of life.
- Connections are key
- How technology is growing bigger every year
My future

- This internship has really opened doors for me in the future to begin and try out new experiences.
Thank you

• I really appreciate getting to know everyone and having this experience and giving me the opportunity.
"Through the Dign' IT internship program, I was able to learn about the jobs that are out there involving technology. I was able to speak with actual web designers and software developers about the specifics of what they do and how they ended up where they are. I want to work in computer science, but I'd never been able to speak with people in the industry before, so it was amazing to have the opportunity to do so. It was also a great experience working with the girls during the Dig' n IT camp and seeing how smart and creative they all were and how the camp was helping to get them interested in the technology that I love."

-Samantha July 31, 2013

"This has opened my eyes to bigger things."

-Darcy August 1, 2013
"This was such an once in a life time opportunity. It was an extraordinary experience for a seventeen year old to see all the different aspects of businesses and was life changing experience. This internship helped to open my eyes to new opportunities."

-Amber August 1, 2013

"Through this internship experience I have learned a lot about myself. I have especially learned to manage my anxiety with public speaking."

-Megan August 2, 2013

'This internship has offered me many great new opportunities, and I have seen the many different job opportunities that computer science can bring."

-Annlie August 1, 2013
Summer 2014:

**Internship**

**Middle School Camp**

Email: julianaa@uidaho.edu

**Teacher Coding Workshop**

Email: Idaho Regional Mathematics Center

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QUESTIONS OR COMMENTS

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