**Designing digital resources
FOR and WITH middle school-aged youth**

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Overview

- Education Development Center, Inc.

- NSDL Projects
  - Gender & Science Digital Library (gsdl.org)
  - Effective Access Research Project
  - The FunWorks (thefunworks.org)
  - MSP2: Designing a series M/S of Virtual Learning Experiences for youth (VLEs)

Process

- Literature Review
- Qualitative & quantitative research with youth and educators
  - Online Surveys
  - Focus Groups
- Youth co-design team
- Pilot testing with youth and educators

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- Online Survey
  - 440 middle school <u>youth</u> from across the nation
  - 617 middle school educators from across the nation

- Youth and Educator Focus Groups
  - 5 middle school <u>youth</u> from Boston, MA
  - 6 middle school educators (NSTA)

Categories of Data

- Computer access and use

- Technology use and web design preferences

- Self-efficacy with technology

- STEM career perceptions

- Science/math topics

- Favorite websites

- Evaluating online information

Computer Access/Use

Computer Use in Science Course

	N	%
About Daily	53	12.0%
Weekly	88	20.0%
About Monthly	111	25.2%
Hardly Ever	54	12.3%
Never	7	1.6%
Missing	127	28.9%
TOTAL	440	100%

Computer Use in Math Course

	N	%
About Daily	28	6.4%
Weekly	35	8.0%
About Monthly	44	10.0%
Hardly Ever	113	25.7%
Never	71	16.1%
Missing	149	33.9%
TOTAL	440	100%

Do you think more of your classes could be taught using the Internet?

	N	%
Yes	197	45%
No	41	9%
Not Sure	75	17%
Missing	127	29%
TOTAL	440	100%

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Technology Use

- School vs. non-school use

- Consumers vs. producers

- Online gaming

- Social networking

  - 71% post messages to friends' pages

  - 67% send private messages (similar to email) to friends

  - 52% post comments on friends' blogs or pictures

  - 38% send group messages (blanket messages)

  - 28% send indirect messages ("poke," "wink," "kudos") to friends

  - 6% use chat functions to talk to friends*

- Finding educational sites

Self-Efficacy with Technology

How comfortable are you using computers?

	N	%
Very Comfortable	203	46%
Comfortable	87	20%
A Little Comfortable	18	4%
Not At All Comfortable	4	1%
Missing	128	29%
TOTAL	440	100%

Figure 1. I am good at collecting information using technology.

Strongly Disagree 1%
Disagree 3%
Missing 13%
Strongly Agree 34%
Neutral 13%
Agree 36%
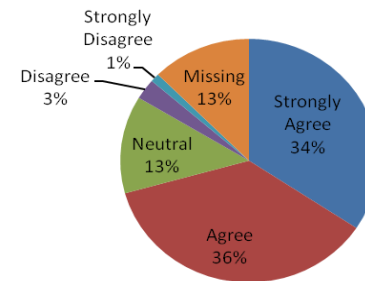
Figure 3. I know how to use technology to solve everyday problems.

Strongly Disagree 2%
Missing 13%
Disagree 7%
Strongly Agree 25%
Neutral 19%
Agree 34%
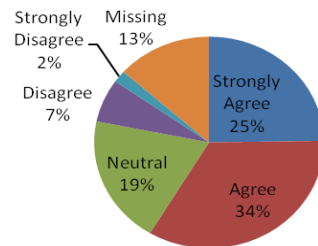
Figure 5. I am good at using technology to better understand ideas I learn in school.

Strongly Disagree 3%
Missing 14%
Disagree 4%
Strongly Agree 23%
Neutral 21%
Agree 35%

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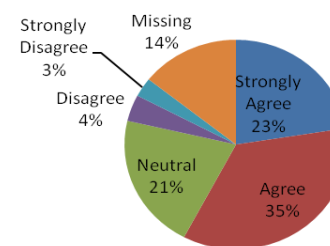
Design Preferences

- Positives:
  - clear layout, easy to navigate
  - use of color, balance between text and images, use of animation/interactive content, not childish
  - limited introductory information
  - multiple search options, limited search results
  - dictionary feature
  - 'original' content
  - ability to create/add content
  - minimal ads

Careers & STEM topics

- Teacher, Veterinarian, Lawyer, Doctor, Police Officer

- Science Topics
  - Life Science, Chemistry/chemicals, Human body, Animals/zoology, Volcanoes

- Math Topics
  - Arithmetic, fractions, algebra, geometry

Analysis

- Use online/resources in science class (vs. math class) —youth would like to see more technology incorporated into their classes

- Most youth are online consumers and some are online producers, find value in both consuming content and creating it

- Mastery of basic computer functions (report writing, Internet searches)

- Approximately 25% of the sample used online social networking sites at least once a day

Analysis

- Science topics of interest include life science and chemistry

- Math topics of interest include arithmetic & fractions

- Identify trustworthy sites through adult recommendations, site URL stem, .org url

- Prefer multiple methods of finding these things, dislike when too many/too few options are presented to them

Analysis

- Direct answers, limited text, videos, and interactivity

- Dislike ads, not enough original information, childish look and feel

Youth Co-Design Teams

- Crucial to ensuring that learner-centered design principles are upheld throughout the creation of a deliverable

- Aid in conceptualization, design, and testing of designs with the intent of creating a prototype of a final deliverable

- Diversity of youth participants, recruited via partner organizations

- EDC developed curriculum, team is convened 1-2 times per week over 2-3 months

- End result: products that reflect the vision of these young designers as well as the needs and interests of their peers

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Meet the Team!
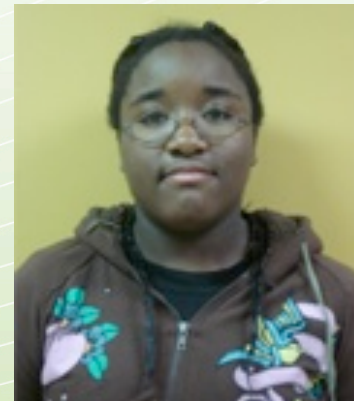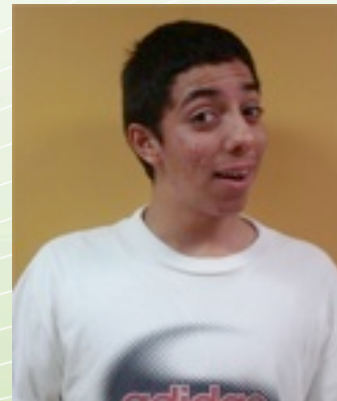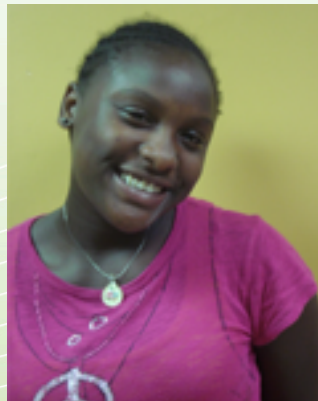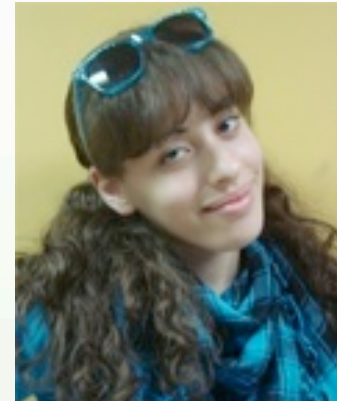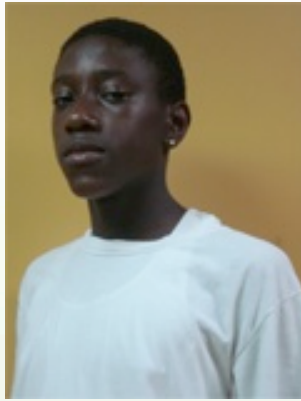
The Design Team

- 9 students, 13-15 years old, 7th/8th grade
- Recruited through a community technology center
- Urban setting – Boston
- Application process
- Participation incentive
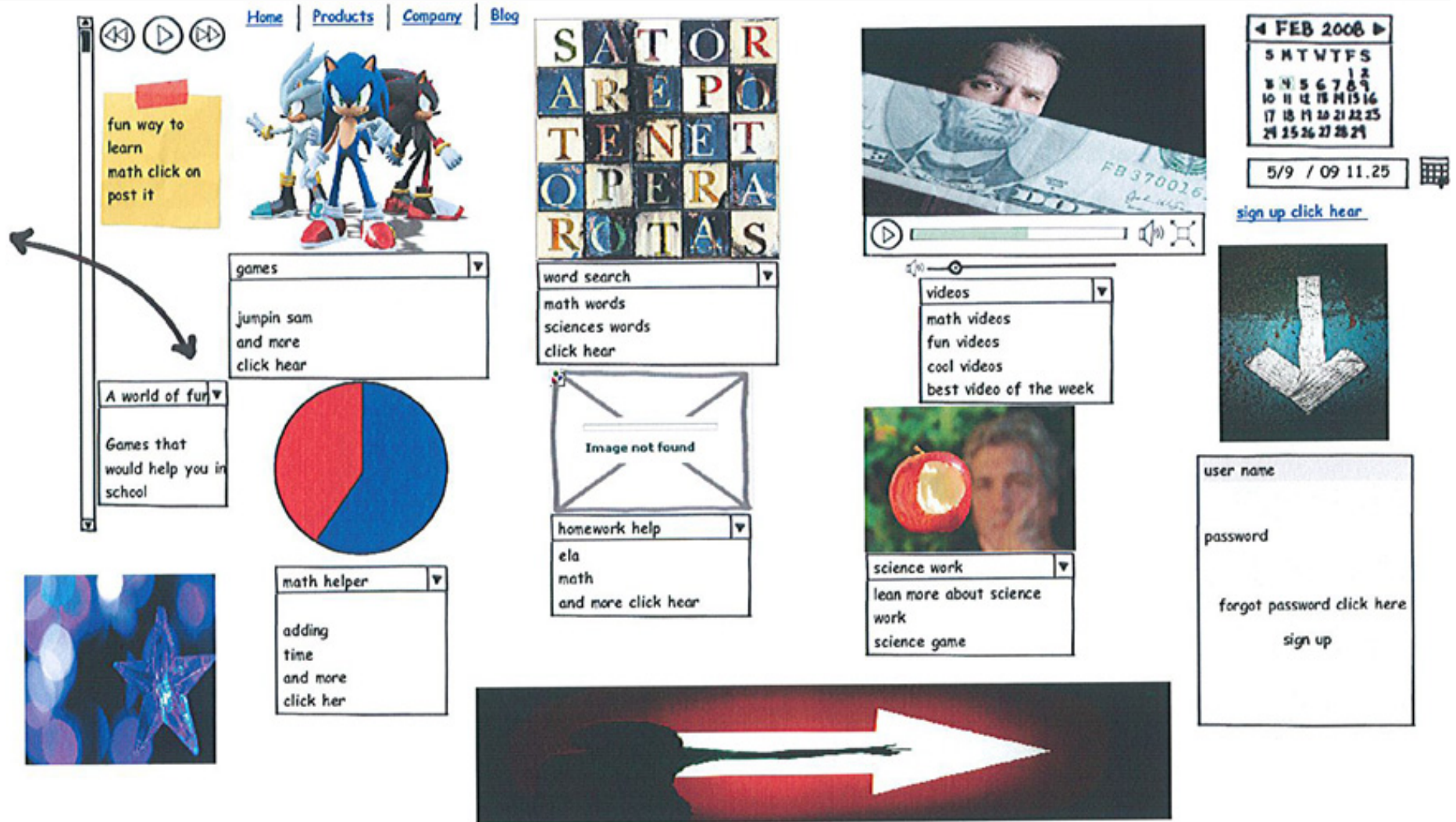- Extensive IRB process – not for the faint of heart!

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Design Team Activities

- Pre-assessment of computer/Web knowledge/skills
- Identification of relevant and engaging Web elements
- Creation of STEM Web site mock-ups
  - Paper
  - Balsamiq
- Critique of STEM Web site mock-ups
- Post-assessment of computer/Web knowledge/ skills

Designs
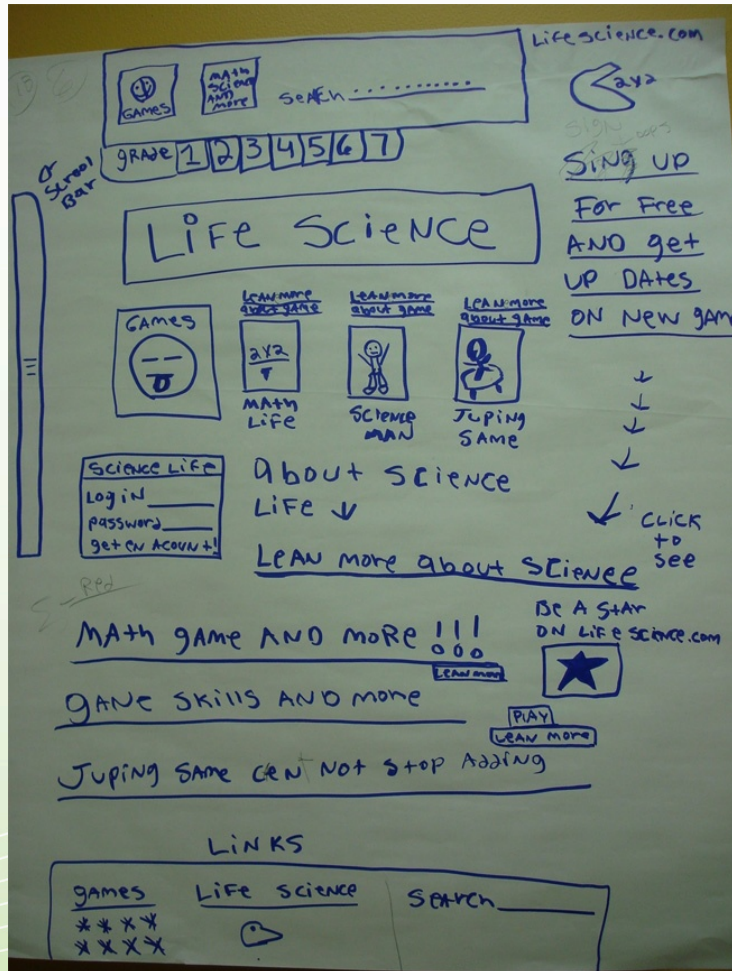
Designs

Lessons Learned

- Trust issues and group dynamics

- Design partner vs. Mentor

- Balancing data collection and active participation

- Continual adjustments to curriculum

- Constructive criticism

- Impact of importance

Thank you!

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