Empowering Underserved Youth Through an EdTech Design Challenge

Kim Ducharme & Janet Gronneberg

2017 UDL Symposium: UDL for Social Justice
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2D / 3D Game Programming
Skyrim Modding

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Design and coding programs are popping up all over the country.
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Getting Smart

Understood.org
Eye to Eye - National
The Possible Project
Yes We Code, Code.org
Girls Who Code
Intel Education Solutions
Google, Microsoft, Yahoo

New York Hall of Science Design Labs
Boys & Girls Club – Local and National
Computer Clubhouse
Harvard Education Innovation Labs
The Artists Asylum
LearnLaunch, YouthBuild USA
NuVu, New Profit
I used to think...

"I was not smart."

– workshop participant
I used to think...

"this was gonna be difficult."

– workshop participant
I used to think...

that it would be a really boring program and that I would hate it.

- workshop participant
I used to think...

“the program would be ok but I mainly did it for the gift card.”

- workshop participant
I used to think I was not smart.

Now I think I can do anything.

– workshop participant
I used to think this was gonna be difficult.

Now I think it’s easy and fun.

– workshop participant
I used to think that it would be a really boring program and that I would hate it.

“Now I think I ended up loving it. It’s awesome! And I’m genuinely interested in making my app.”

– workshop participant
I used to think the program would be ok but I mainly did it for the gift card.

"Now I think it’s a good program that works on problem solving and I would recommend it for people [who] aren’t sure about it.

– workshop participant
#DesignThat App EdTech Design Challenge

http://edtechchallenge.cast.org
Program Goals

- Foster a **strength-based mindset** and underrepresented youth.
- Give a sense for **design process skills**, an **innovative mindset**, and a taste for **entrepreneurship**.
- **Connect youth with mentors** from creative, design, technical and entrepreneurial fields.
- **Shift public awareness** of the strengths, talents and creative efforts of underrepresented youth.
Program Components

- Design challenge kick off
- Incubator program
- Showcase & pitch
- Public awareness campaign
EdTech Design Challenge

— a recap of the pilot
Design Thinking

Problem finding

- Learn about your audience
  - EMPATHY
  - Define the problem space based on empathy insights

Problem solving

- Brainstorm creative solutions
  - DEFINE
  - IDEATE

Solution testing

- Test your ideas, iterate based on feedback
  - PROTOTYPE
  - TEST
  - Try experiments in the classroom
EdTech Design Challenge - pilot: Process

Define the Challenge  Brainstorm  Sketch  Prototype  Pitch
EdTech Design Challenge - pilot

Define the challenge
EdTech Design Challenge - pilot

Brainstorm
EdTech Design Challenge

Brainstorm clip:

https://youtu.be/mwfaTCnqdVs
EdTech Design Challenge - pilot

Brainstorm

1.   2.   3   4.   5.

Narrow to 3-5 top ideas
- choose which idea to work on
EdTech Design Challenge - pilot

Sketch

Team 3

Ask questions
- who, what, why, when, where, how

Sketch variations

Choose one direction
EdTech Design Challenge - pilot

Prototype

1.  

2.  

home  screen 2  screen 3  screen 4  screen 5
EdTech Design Challenge - pilot

Build and develop pitches

Refined sketches

Storyboard & app

Create pitch

Pitch deck:

- 
- 
- 

begin

end
EdTech Design Challenge - pilot

Prototype
The problem

Bob Purple is bored, has a mad mother, and needs practice/study for school.

Audience:

T for Teen 13 and up.
HOPES WIZZ

LOGO/LOAD SCREEN

Search or Mystery
Voice it Out!!
Hobby wizard!!
By Location!!

Google-like search or choose by mystery, speaking it out (think site), having a question answer, or by your location

RECORD YOUR MYSTIC DREAMS and get assisted by "SIEE-LIKE WIZARD"
The Famous Voices App
EdTech Design Challenge - incubator

Gauging interest in seeing ideas through
Universal Design for Learning Guidelines

Provide Multiple Means of Engagement
Purposeful, motivated learners

- Provide options for self-regulation
  + Promote expectations and beliefs that optimize motivation
  + Facilitate personal coping skills and strategies
  + Develop self-assessment and reflection

Provide Multiple Means of Representation
Resourceful, knowledgeable learners

- Provide options for comprehension
  + Activate or supply background knowledge
  + Highlight patterns, critical features, big ideas, and relationships
  + Guide information processing, visualization, and manipulation
  + Maximize transfer and generalization

Provide Multiple Means of Action & Expression
Strategic, goal-directed learners

- Provide options for executive functions
  + Guide appropriate goal-setting
  + Support planning and strategy development
  + Enhance capacity for monitoring progress

- Provide options for expression and communication
  + Use multiple media for communication
  + Use multiple tools for construction and composition
  + Build fluencies with graduated levels of support for practice and performance

- Provide options for physical action
  + Vary the methods for response and navigation
  + Optimize access to tools and assistive technologies

- Provide options for language, mathematical expressions, and symbols
  + Clarify vocabulary and symbols
  + Clarify syntax and structure
  + Support decoding of text, mathematical notation, and symbols
  + Promote understanding across languages
  + Illustrate through multiple media

- Provide options for perception
  + Offer ways of customizing the display of information
  + Offer alternatives for auditory information
  + Offer alternatives for visual information

- Provide options for recruiting interest
  + Optimize individual choice and autonomy
  + Optimize relevance, value, and authenticity
  + Minimize threats and distractions
### Universal Design for Learning Guidelines

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- **Provide options for sustaining effort and persistence**
  - Heighten salience of goals and objectives
  - Vary demands and resources to optimize challenge
  - Foster collaboration and community
  - Increase mastery-oriented feedback

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Outcomes

It was really fast, and there were challenges, but we saw some good outcomes, including these:

- The kids did some great work, and felt good about it
- They learned a design process tool useful for solving all sorts of problems
- They learned they were capable of ideating and prototyping real apps
- We saw positive change in the pre- to post-surveys
Feelings ◆ pre- to --> □ post-survey

1 = not like me  5 = a lot like me

I feel confident sharing my ideas in a group.
1 2 3 4 5

I know about the different roles on a design team.
1 2 3 4 5

I believe creativity is a process anyone can learn.
1 2 3 4 5

I know the different phases of the product design process.
1 2 3 4 5

I feel confident pitching an idea to experts.
1 2 3 4 5

Pre: 19 teens  Post: 12 teens  (weighted averages)
<table>
<thead>
<tr>
<th>Teen Program Components</th>
<th>CAST EdTech Design Challenge</th>
<th>Design Courses (IDEO courses, Stanford Design School, YouthX)</th>
<th>Free Online Coding Courses (Codeacademy, free Code camp, Khan Academy, Code.org)</th>
<th>Entrepreneur camps for teens (YouthDigital, IDTEch)</th>
<th>Coding camps for teens (YouthDigital, IDTEch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create tech solutions to <em>learning</em> challenges of importance</td>
<td>✅</td>
<td>x</td>
<td>x</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td>to them</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Learn &quot;design-thinking&quot; as a model for problem-solving</td>
<td>✅</td>
<td>✅</td>
<td>some</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td>Gain exposure to coding skills</td>
<td>✅</td>
<td>x</td>
<td>✅</td>
<td>some</td>
<td>✅</td>
</tr>
<tr>
<td>Try out multiple roles fr. tech industry: innovator, designer, coder</td>
<td>✅</td>
<td>some</td>
<td>x</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>Be supported if you struggle academically</td>
<td>✅</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Be mentored by industry professionals</td>
<td>✅</td>
<td>some</td>
<td>x</td>
<td>some</td>
<td>some</td>
</tr>
<tr>
<td>Learn workforce skills: solving complex problems, critical thinking, creativity, and decision-making</td>
<td>✅</td>
<td>some</td>
<td>?</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>Participate regardless of socioeconomic status (program is free)</td>
<td>✅</td>
<td>x</td>
<td>✅</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Be encouraged to participate in something you wouldn’t normally sign up for</td>
<td>✅</td>
<td>x</td>
<td>some</td>
<td>some</td>
<td>x</td>
</tr>
</tbody>
</table>
Looking ahead: Multiple paths forward

- Embed program (or the 9-hr design component) with national youth-serving organizations (BGCA, YouthBuild USA, Code.org)
- Align with corporate philanthropic initiatives (e.g., Verizon App Challenge)
- Expand app focus to specific workforce initiatives (e.g., Advanced Manufacturing Innovation Centers)
- Secure funding to pilot and evaluate full implementation to build evidence of impact (e.g., NSF)
Challenges, Lessons Learned

- Design challenge could be embedded into so many existing youth-serving orgs. How do we get them to know about what we’re doing?
- The Boys & Girls Club has so many programs, difficult to prioritize
- We learned a lot, but need to do it again, and again. Need funding
- Labeling, recruiting: Started out LD —> underserved —> underrepresented
Discussion

We welcome your feedback, input, questions, and ideas

- As Mirko Chardin said in his keynote: How do we move from intention to impact?
- Possible partners?
- Other?
Thank you!

Kim Ducharme
Director of Educational User Experience Design
kducharme [at] cast.org | @kimducharme

Janet Gronneberg
Development Officer
jgronneberg [at] cast.org