



Planting Zinnias at home



Scientizing *Daily Life* with New Social, Mobile, & Wearable Technologies



Tamara L. Clegg * University of Maryland

Seeing the **World** through Scientific **Lenses**



Finding **practical**
applications

Using Science to Achieve
goals

Scientizing daily life activities

Procedural & Conceptual
Understanding

Interest

Social Interactions

Personal
Connections

Building Blocks
to disposition development

Scientizing Framework

The Four Building Blocks

Seamless Scientizing



Mobile, social, ubiquitous

Scientizing the Body



Wearables

Future Work

Science Everywhere



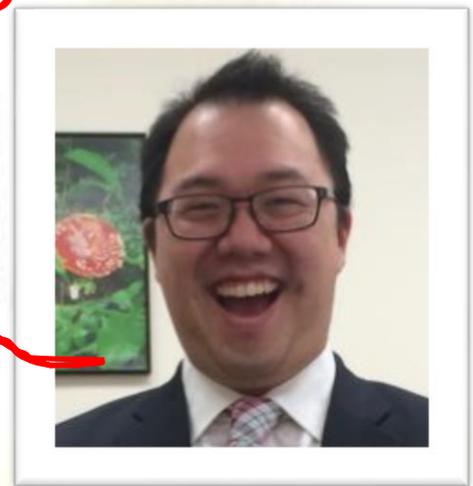
Social Media App

Interactive Displays

Home * School * After-school

June Ahn

Jason Yip



Science
Everywhere

Daniel Pauw * Kelly Mills * Judith Uchidiuno * Beth Bonsignore * Austin Beck * Caroline Pitt

Seeing the **World** through Scientific **Lenses**



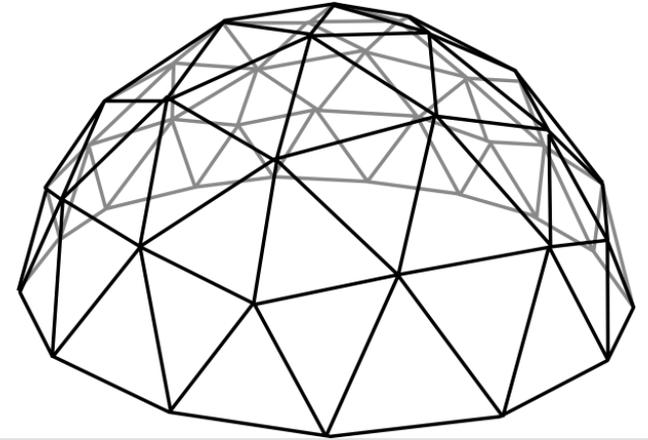
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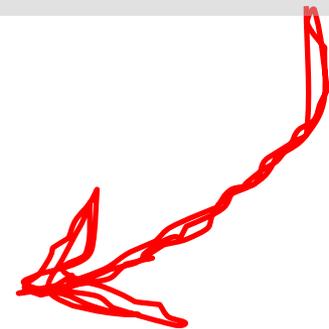
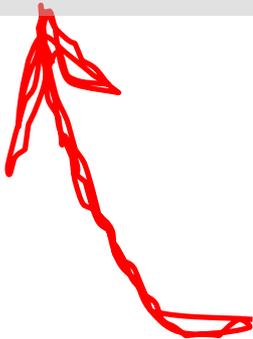


Home

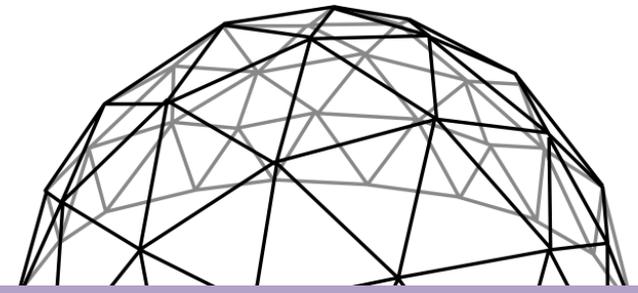


After school

Information Flow



School



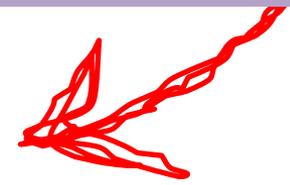
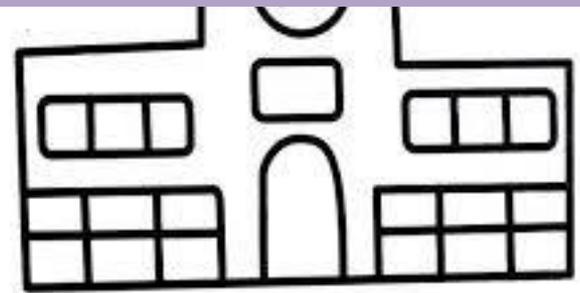
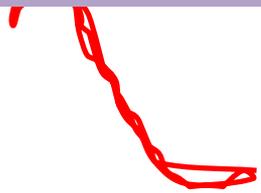
Technology alone...

Home

Information
Practices

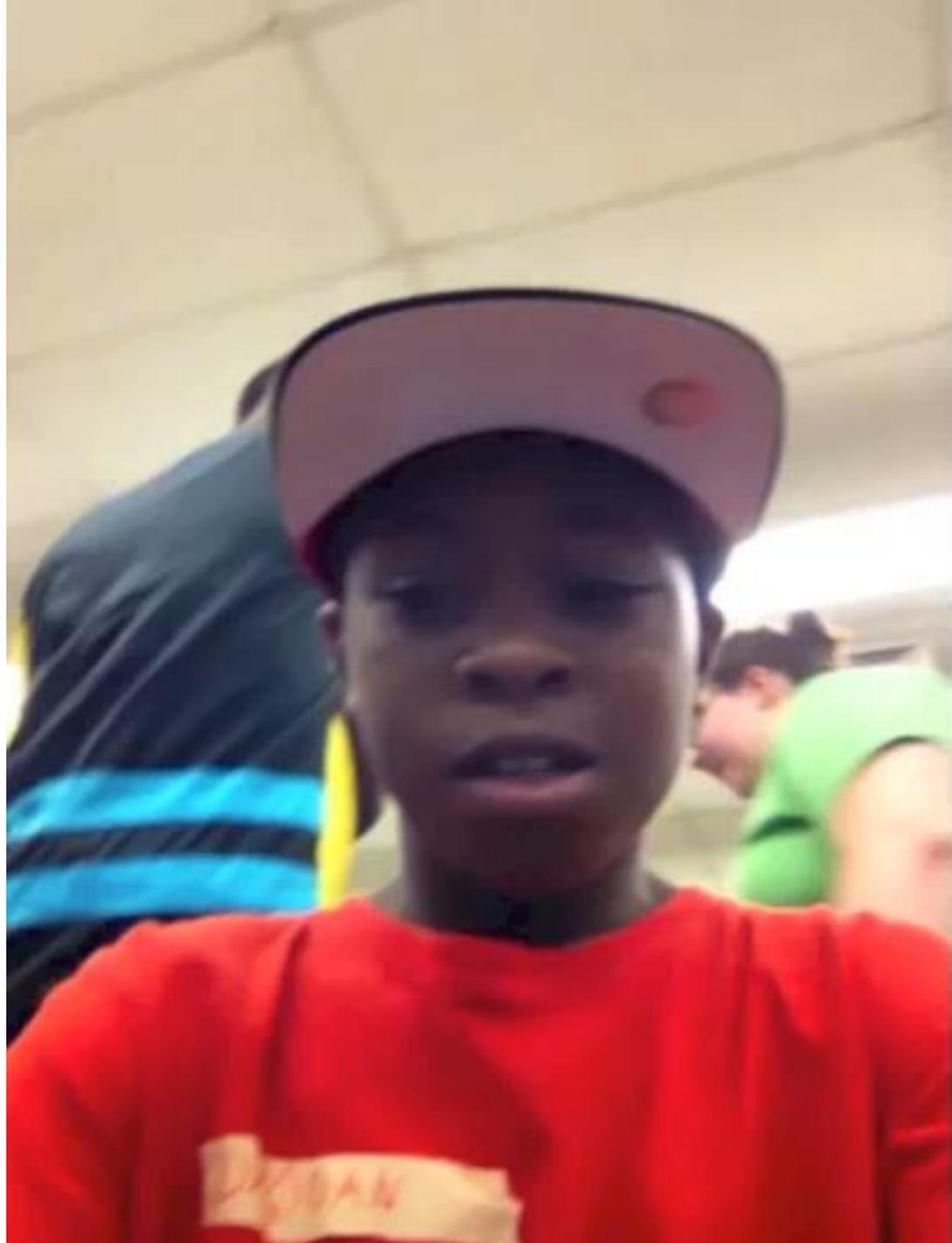
After school

is not enough

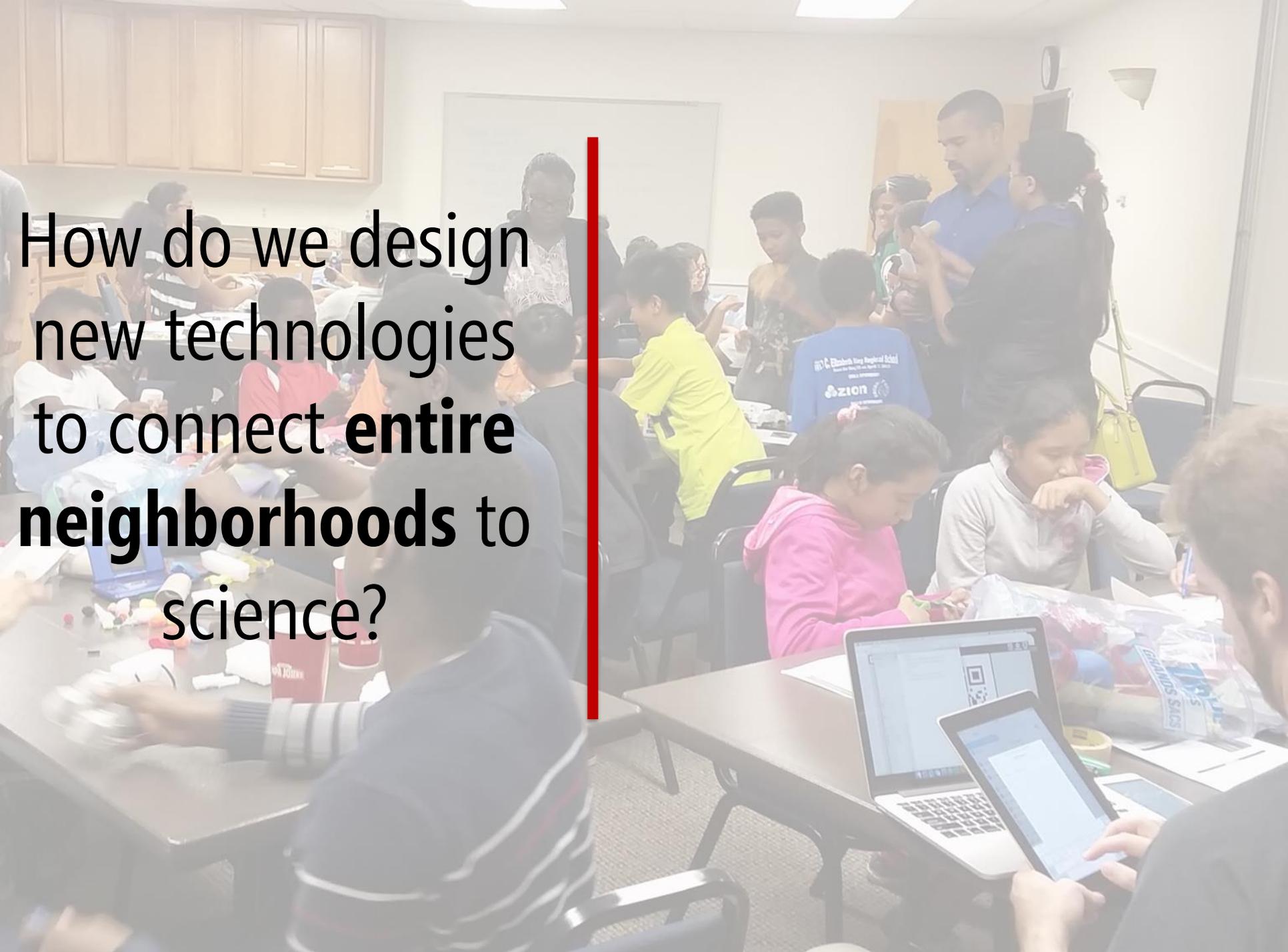


School

**Social media
can make resources
visible**

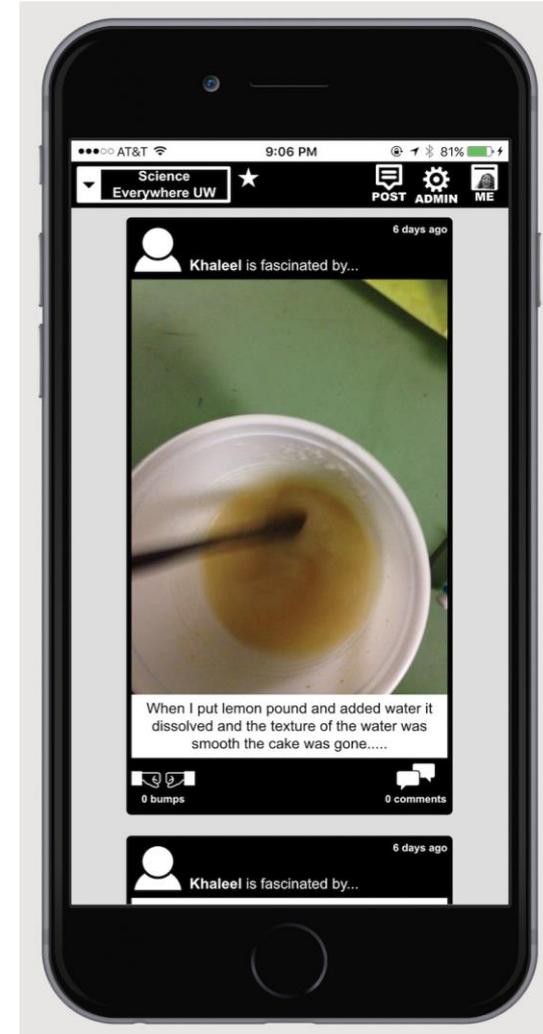


How do we design
new technologies
to connect **entire**
neighborhoods to
science?





Tangible, community displays



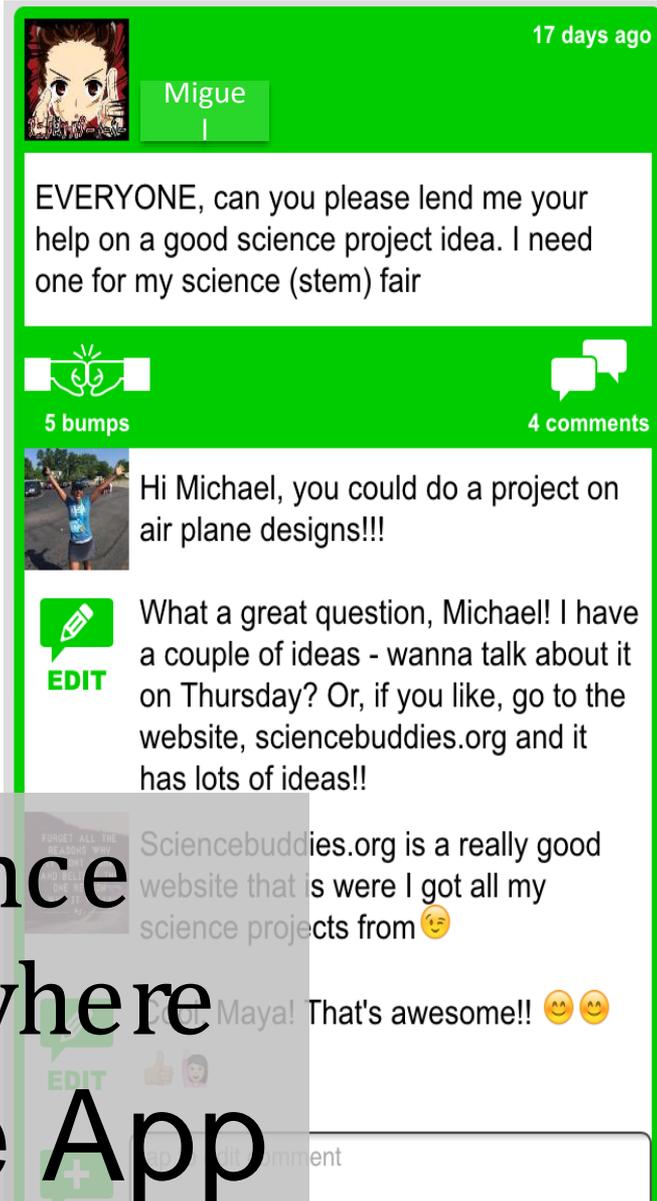
Mobile social media

Participatory Design with Community



Children * Parents * Teachers

Science Everywhere Mobile App



What are the **opportunities** and **challenges** of leveraging **social media** to support **scientizing** across contexts?

1 February 2016

 EDIT

Alexia



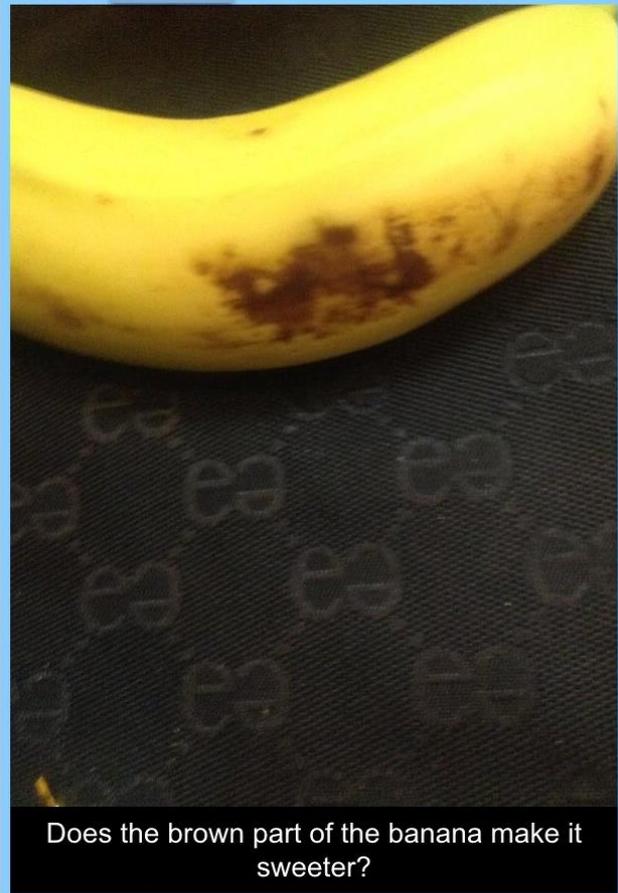
Planting Zinnias at homework club.

 5 bumps

 1 comment

27 February 2016

 Patience is wondering about...



Does the brown part of the banana make it sweeter?

 2 bumps

 2 comments

16 February 2016

 Kristen



How dose eggs come to have a different texture when put together with oil,salt,and heat

 3 bumps

 2 comments

15 February 2016

 EDIT

Malcom

I wonder if you place something outside under the sun will it affect the way it looks/taste?! 🤔

 4 bumps

 2 comments

Opportunity
New contexts for recognizing science



Kaitlyn



Extending Science Everywhere Experiences

The gravel truck broke the side way but in last picture at least i still have a chunk of it until my dad coverd it with stuff they used for roads



4 bumps

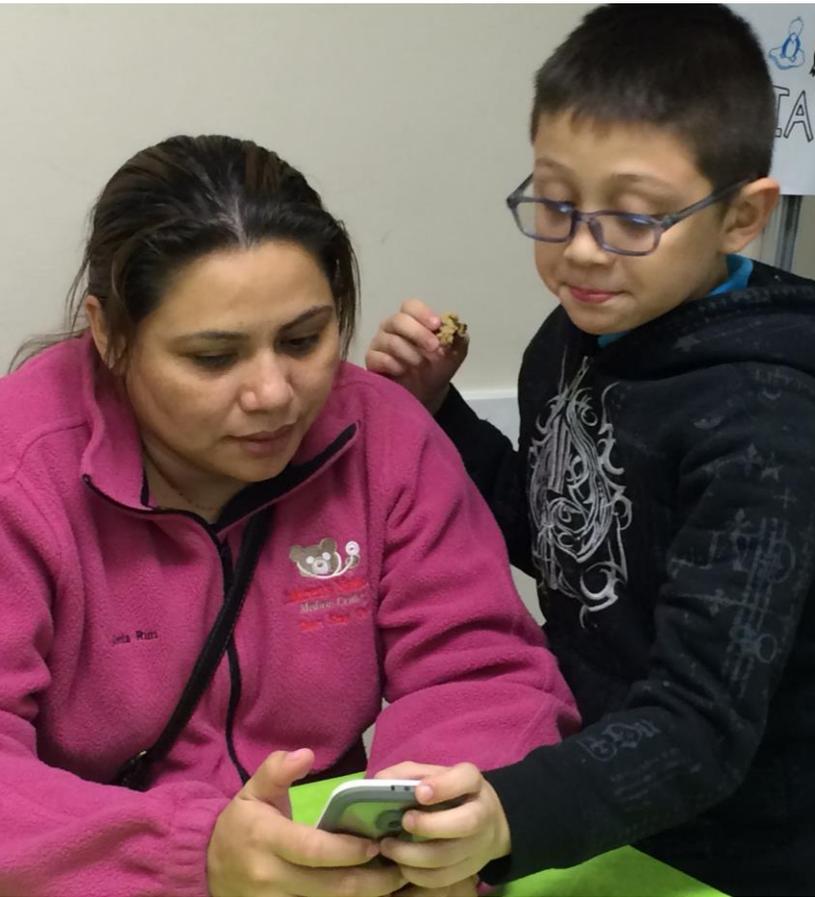


2 comments



Challenge

After-school facilitators and parents need help promoting scientific practices and skills



Parents



Mentors

Mentors and parents bring different contextual knowledge that influences our recognition of learning



Watching the nba summer league second game brought my heart rate down after running because less blood must be pumped when I am just sitting down and not stressing my muscles and lungs by breathing hard and also the fact that the game was just summer league and not nba didn't stress me for my team to win.



5 bumps



1 comment

Opportunity

Integrating science with everyday life

Scientifically Meaningful experiences



“Watching the nba
 ... and lungs by
 summer league [second]
 breathing hard and also
 game brought my heart
 the fact that the game
 rate down after running
 was just summer league
 because less blood must
 and not nba didn't stress
 be pumped when I am”
 me for my team to win.”
 just sitting down and not
 stressing my muscles...”

Watching the nba summer league second game brought my heart rate down after running because less blood must be pumped when I am just sitting down and not stressing my muscles and lungs by breathing hard and also the fact that the game was just summer league and not nba didn't stress me for my team to win.

Scientizing
 Meaningful
 Experiences

20 February 2016
EDIT Bronwyn



First try at the rock candy. If u put it in the freazer does it effect how it form than if u just leave it out ? 🤔

4 bumps 6 comments

“First try at the rock candy. If **u** put it in the freazer does it effect how it form than if **u** just leave it out? 🤔”

Text Speech

Emojis



Joanna

22 October 2015



We post it to much for us

3 bumps

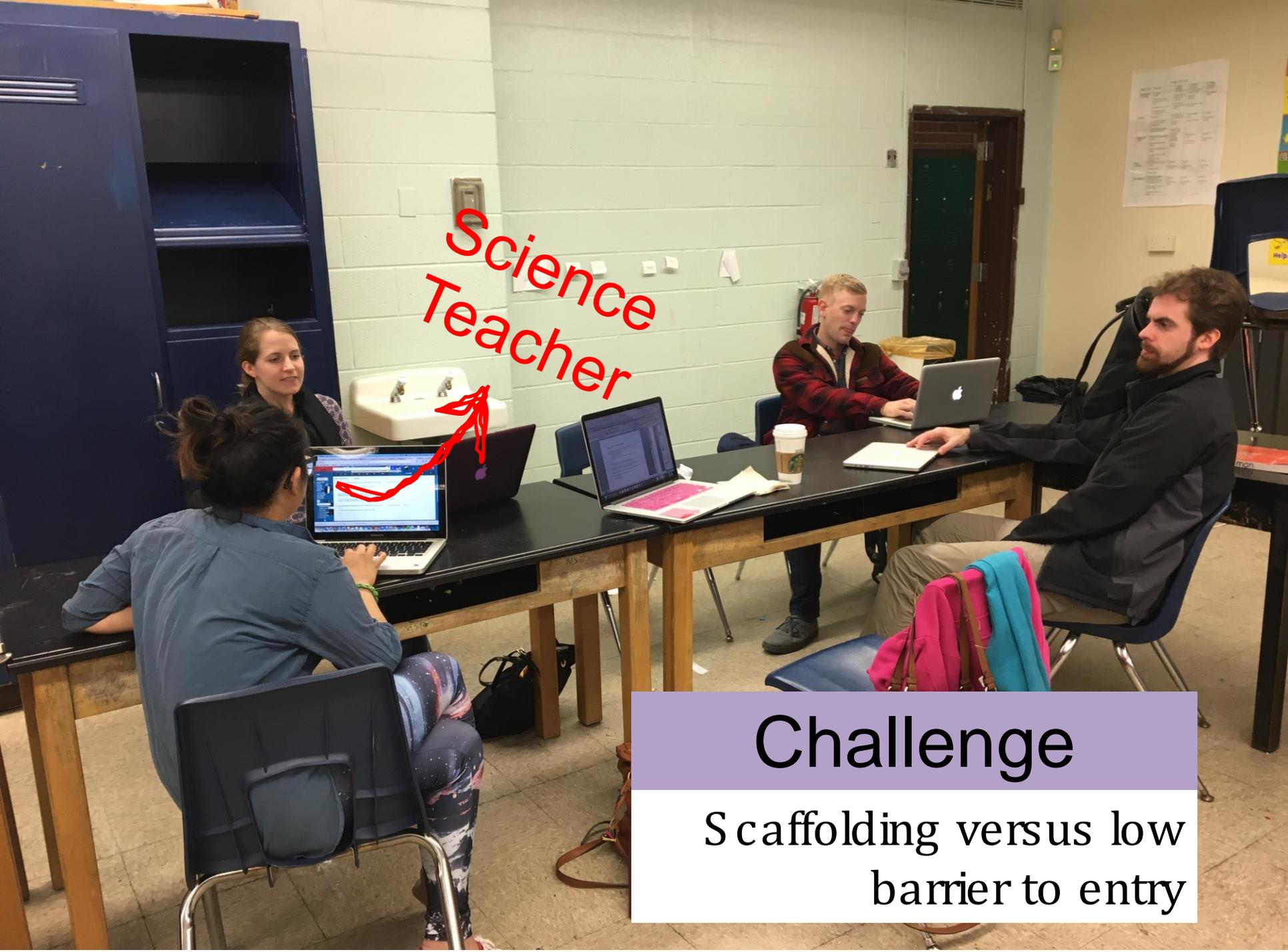
0 comments

“We post it to much for us”

Ill-formed Exploratory Science



22 October 2015



Science
Teacher

Challenge

Scaffolding versus low
barrier to entry

2119 A

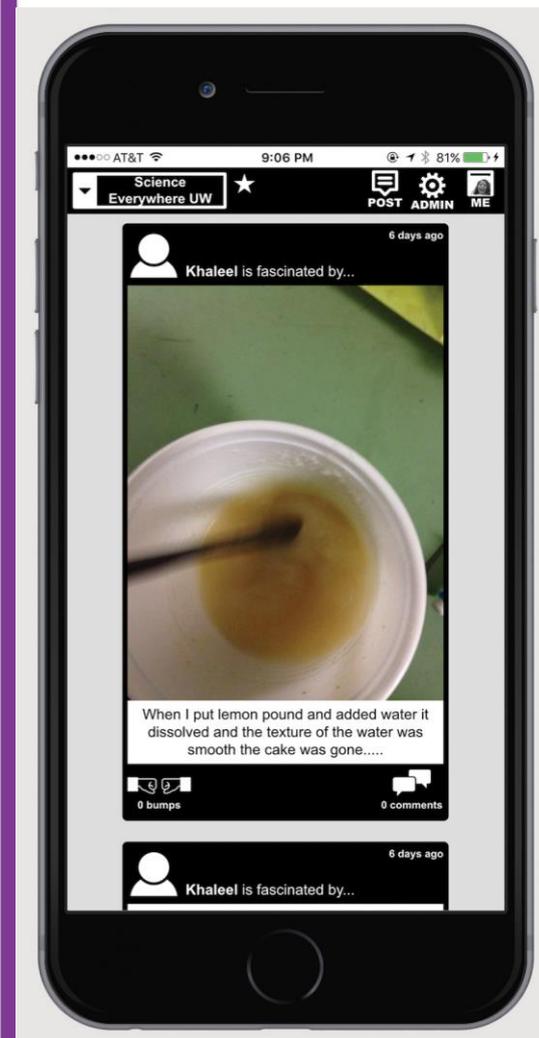
Challenge

Getting parents and mentors engaged with children's posts





Tangible, community displays



Mobile social media

Take Away

Children need opportunities to connect and share informal learning experiences with science



Scientizing Framework

The Four Building Blocks

Seamless Scientizing



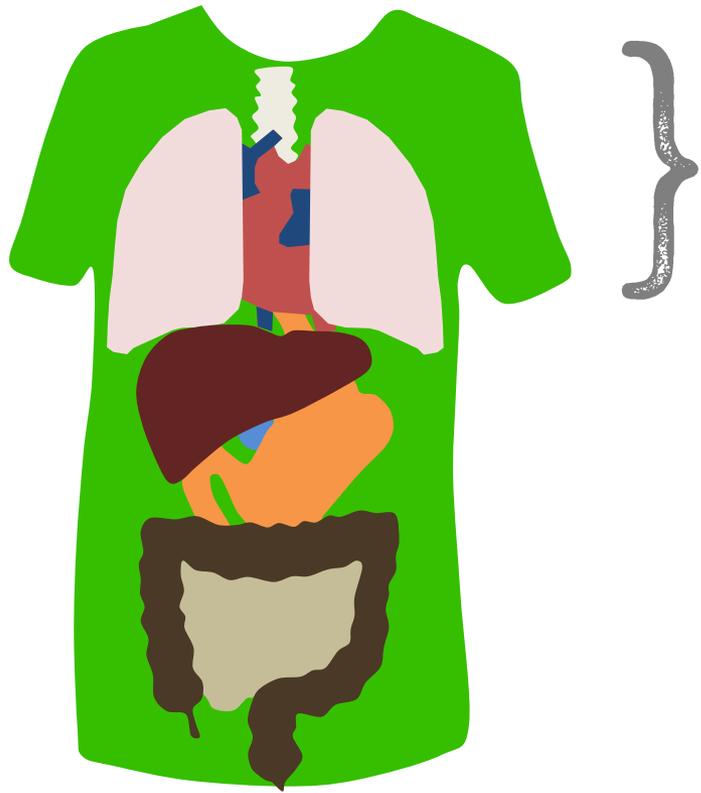
Mobile, social, ubiquitous

Scientizing the Body



Wearables

Future Work



What if our clothes revealed how our body's **functioned**?

How could this **change** the way **children learn** about and understand their bodies?

Could a t-shirt be a **platform** for **experimentation** and **inquiry**?

Live Physiological Sensing & Visualization

LPSV



Angelisa Plane



Amy Green



Vanessa Oguamanam * Seokbin Kang



Leyla Norooz

BodyVis Team

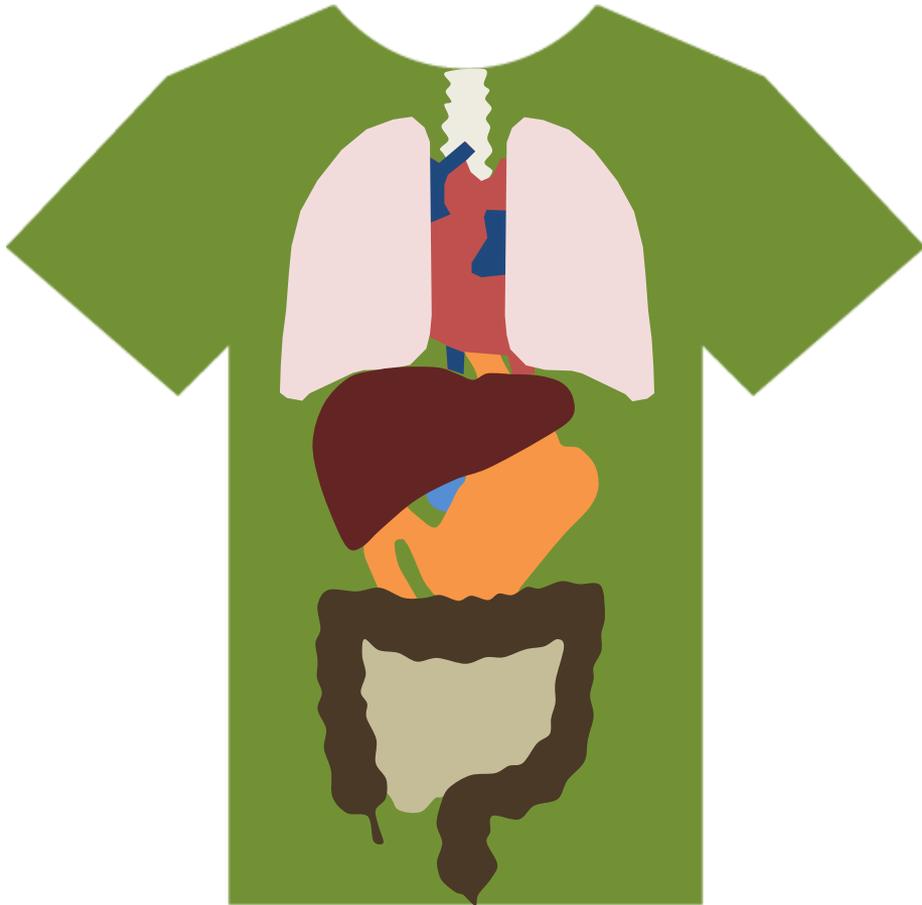
A group of children are sitting on a carpeted floor, engaged in a hands-on design activity. They are using various materials like cardboard, plastic, and markers to create prototypes. One child is writing on a large sheet of paper. The paper has handwritten notes and diagrams. The notes include 'Lungs inflate + deflate can show big & small breaths' and 'Small in to function as roller coast'. There are also drawings of a fan-like structure made of cardboard and a structure made of plastic and yellow material.

Participatory Design with Children

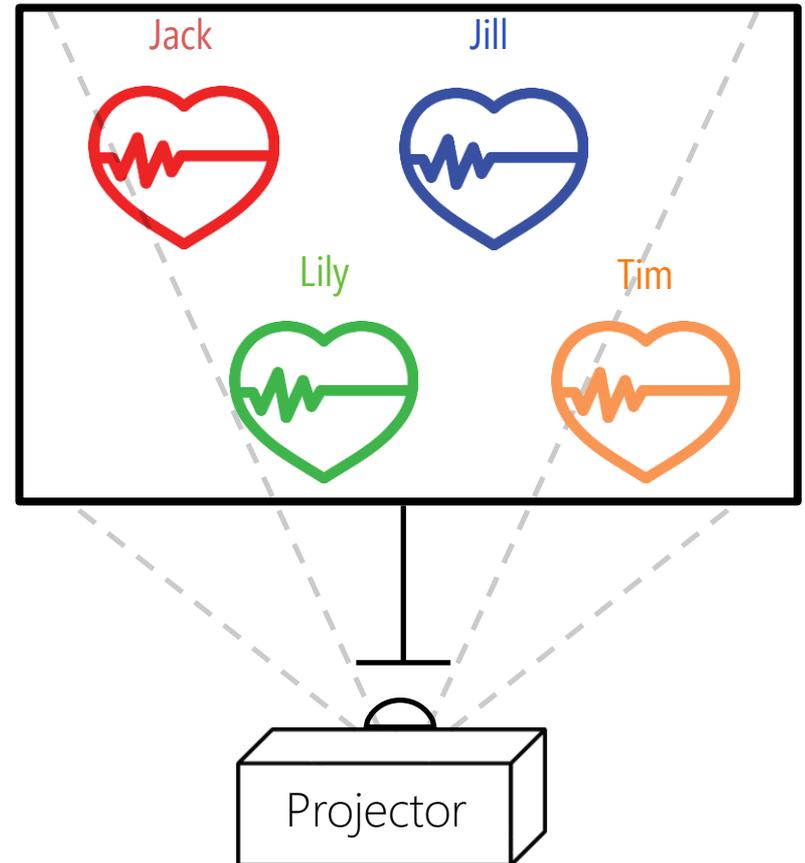
Druin, A. CHI'99

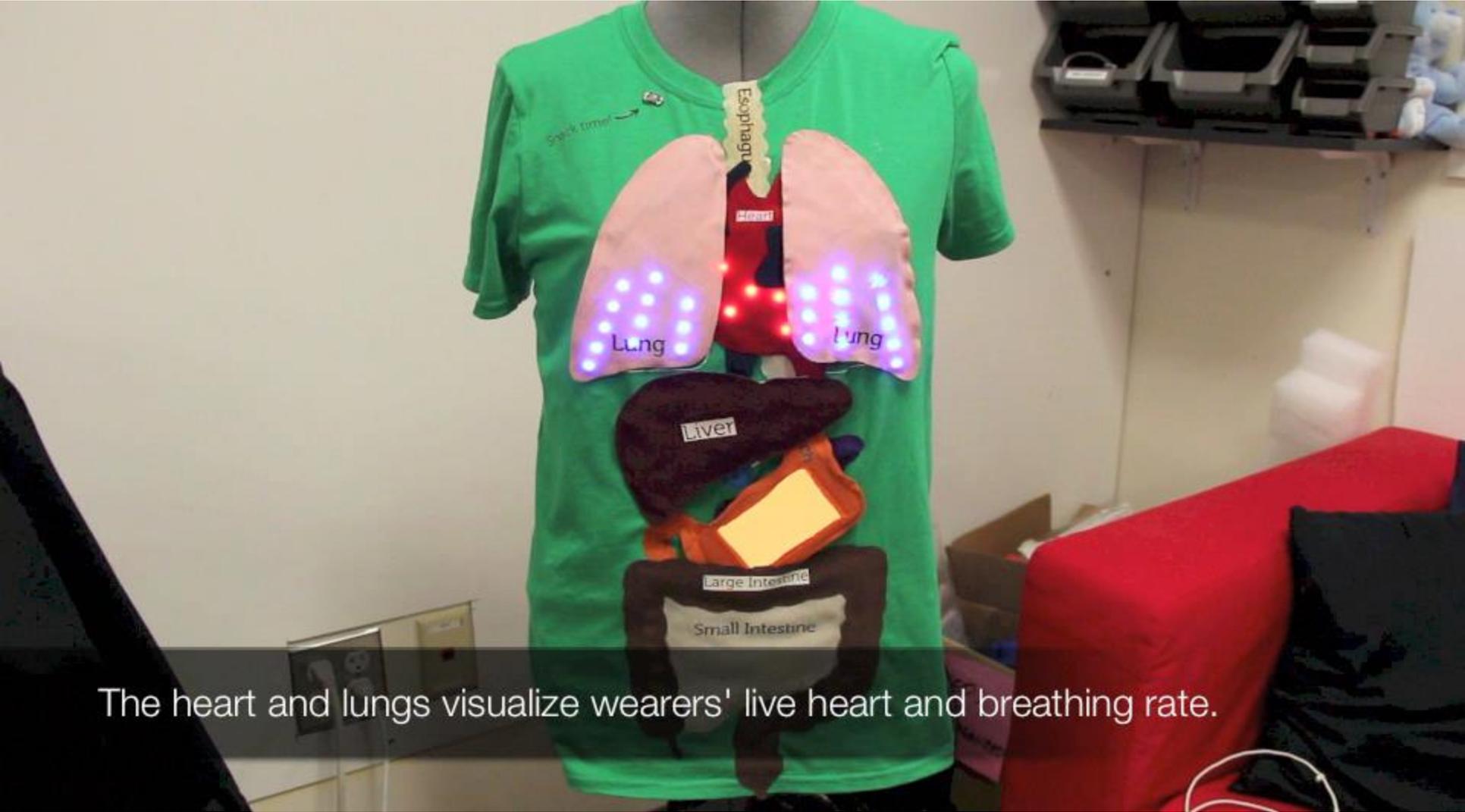
LPSV Tools

BodyVis



SharedVis





The heart and lungs visualize wearers' live heart and breathing rate.

Does not support
comparison across
learners

Need more support for
quantitative analysis

Hard to see data **over**
time

Limitations

SHAREDPHYS

Live Physiological Sensing, Whole-Body Interaction, &
Large-Screen Vis to Support Shared Inquiry Experiences

Seokbin Kang, Leyla Norooz, Vanessa Oguamanam,
Angelisa Plane, Tamara L. Clegg, Jon E. Froehlich



makeability lab



COMPUTER SCIENCE
UNIVERSITY OF MARYLAND

COLLEGE OF
INFORMATION
STUDIES





Multiple Session Deployment

Integrated use of tools

Current Work

Seeing the **World** through Scientific **Lenses**



Finding **practical**
applications

Using Science to Achieve
goals

Scientizing daily life activities

Church



POST



ADMIN



ME



I learned about the heart inside my body. The heart helps you pick up blood. I wonder if the heart helps you breathe



8 bumps

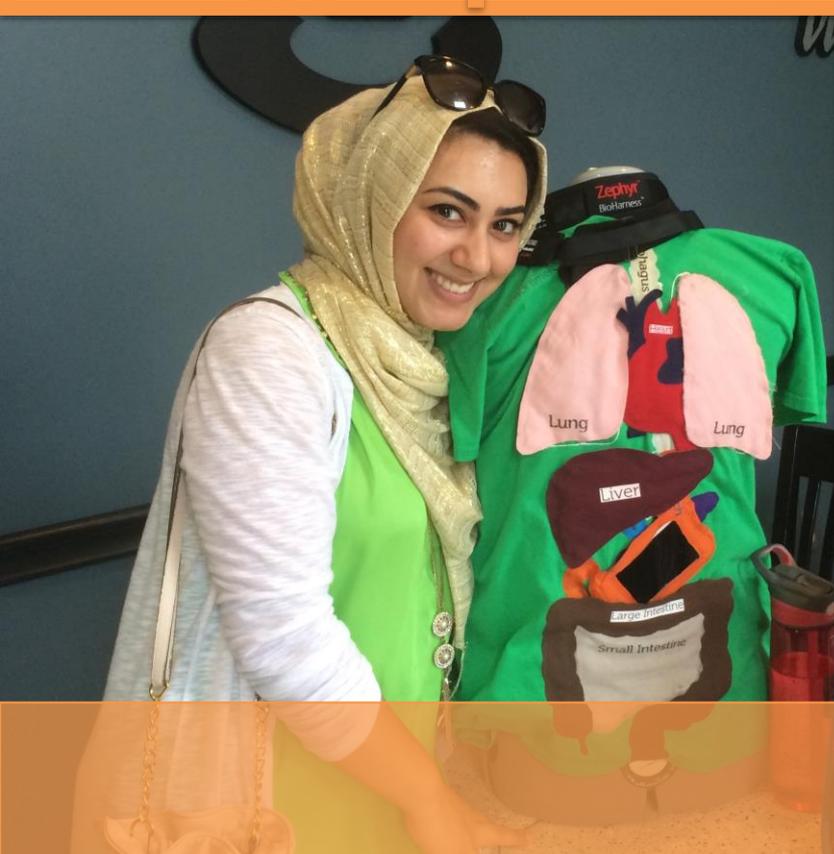


1 comment

Complimenting Strengths



June Ahn *
 Jason Yip * Jeff
 Rick * Beth
 Bonsignore *
 Daniel Pauw *
 Austin Beck *
 Kelly Mills *
 Rachael Marr
NSF #1441523



BodyVis Team

NSF #1441184

Questions

?



Maryland

Seattle



Designing with the Community