

# Design Thinking in Academia



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Thank you for the lovely introductions. Thank you to the forum organizers for inviting me to the conference.

I thought we will start the forum with something that a lot of public libraries are paying attention to these days, design thinking, and think about how design thinking can be in action in academia, specifically in academic libraries,

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# A Bit About Me

Investigate **how underserved and disadvantaged young adults** use libraries for the development of emerging digital literacy skills essential for STEM learning, and **how libraries can play a role** in developing and sustaining young adults' interest in STEM.



A bit about me. I teach in the MLIS program at the iSchool at UMD, teaching courses in the YX, SL specializations, and courses in our Ph.D program. My broad research agenda is to [read slide]. The young adults that I work with are mostly middle and high school age. To achieve this broad goal, my research breaks into two threads: (1) working directly with young adults to leverage the strengths in the library by creating learning environments that help them develop digital literacy skills and increase STEM interest. For example, in an after-school program in school libraries in DCPS a couple of years ago, I leveraged the interest in youth in science fiction and science-infused movies and librarians' knowledge of these fiction and movies and encourage youth to produce science stories in various formats that builds the interests of these young people in STEM. (2) second thread, working directly with librarians to enhance their abilities and skills to facilitate digital literacy and STEM learning in libraries. Essentially, in this second thread, I bring research and practice together to enhance the skills of in-service and pre-service youth and school librarians. For example, in the Graduate Certificate in Youth Experience, that I have co-developed with my colleagues at the iSchool and College of Education here at the University of Maryland, we train librarians to facilitate learning with technology, and teach them Methods for engaging youth as co-designers of youth library programs through the use of the design thinking process. Design thinking is evident in both

threads that I work with. In alignment with this second thread, I will be talking about some of the work that I have been doing with the YX Certificate program and the Libraries Ready to Code program to demonstrate how librarians embrace design thinking as a mindset and a process.

# Outline of My Talk

- What is Design Thinking (DT)?
- DT in Action: 2 examples
- DT in the Academia
- Q & A



I will begin the talk today by briefly defining design thinking and then in the interest of time, I will show you two programs where DT is in action – one in a school and the other initiated by a public library.

# What is Design Thinking (DT)?

## INSPIRATION

*I have a challenge.*

## IDEATION

*I've learned something.*

## ITERATION

*I have a prototype.*

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I want to give a shout-out to folks at IDEO who created a super well done toolkit (I have provided the link here which you can refer to during or after the presentation). This was developed through the funds from the Global Libraries Program at the Bill and Melinda Gates Foundation. A lot of my sharing today is based on the work that they have done.

Libraries are really late to the party when it comes to DT because we have been stuck on the “expert” model of delivery. But, businesses and for-profit education know that patrons will only pay for their service if it meets their needs, hence have embraced the approach of DT for decades. DT is both an approach and a mindset. It is a mindset because you start viewing the world like a designer. You embrace ambiguity, you embrace the unknown, and you also views problems as opportunities to transform work and create innovations. DT is also an approach, and that is what I am going to mostly talk about today. They are related. As you master the approach, you tend to think as a designer, hence developing the mindset.

There are three phases to keep in mind in DT. While IDEO presents them as phases, by no means are they sequential and linear. Designers go back and forth between these phases.

[Click] Inspiration is about framing a design challenge and discovering new perspectives on the opportunity. How might my classroom be designed to better meet my students' needs? This could stem from a classroom teacher seeing that regardless of how beautiful what he puts on his classroom's bulletin board, the kids never engage with the content. So, I have a challenge.

[Click] Ideation is about generating ideas and making them tangible. While interviewing his students, he found that the problem was that the students could not see the bulletin boards. He lowered the bulletin boards so that his students could actually see the content. After making these adjustments, his students are more engaged and move more fluidly in the classroom space. So, I've learned something

[Click] Iteration is about continual experimentation based on user feedback. The teacher consistently engages his students in helping him more effectively shape their learning experience. He is using design to re-imagine his classroom through the lens of his students' eyes. He is now creating semi-private space for the children to congregate and chat about the content of the bulletin board, he is now creating an interactive board. I have a prototype. Keep in mind that this is an iterative process, and you may go through these phases multiple times to solve the challenge or identify it, continuously ideate and iterate.

# DT in Action

Kenosha Public Library



**Sew Sew Gadgets!**  
A free sewable circuits mini-camp with the Kenosha Public Library

April 23rd - 26th  
4:00-6:00 PM  
Brass Community School

Snack included!

Do you like science and technology?  
Do you like to make things?

In this mini-camp, you will design and create an item that lights up using conductive thread, LEDs, and batteries!

Day 1: Learn how to sew.  
Day 2: Learn how circuits work.  
Day 3: Create your own project using sewable circuits!  
Day 4: Finish your project & teach your parents.

Questions? want to sign up?  
Ask Mrs. Brandt: [kbrandt@kust.edu](mailto:kbrandt@kust.edu)

**KENOSHA**  
PUBLIC LIBRARY  
WHERE KENOSHA CONNECTS

**YOUTH EXPERIENCE**



The first example I am going to share with you is a program that has been created using the DT approach that is run in a school library, but developed by a youth services librarian in a public library. My student, a youth services librarian from Kenosha Public Library, in Kenosha, Wisconsin, Heather Thompson developed Sew Sew Gadgets Sewable Circuits MiniCamp. It was an after-school program for 3<sup>rd</sup>-5<sup>th</sup> graders that took place for two hours per day for four consecutive days. Participants learned the basics of hand sewing, how electricity flows through a circuit and then apply this knowledge to designing and creating a project that uses conductive thread, fabric, batteries and LEDs. This program was led by Heather in collaboration with Brass Community School in Kenosha. So, we are going to backtrack on how Heather came about the idea. There are many challenges encountered that inspired this project, but for the interest of time, I am going to share just one challenge, and walk you through how Heather used DT to approach this.

# Kenosha Public Library

Inspiration (Design Challenge)

## INSPIRATION

*I have a  
challenge.*

## DESIGN CHALLENGE

What facilitation and resources do we need to have in our makerspaces that will allow children from BCS to make something they like?



So, we begin with “I have a challenge”. The school already has a maker spaces, so the challenge is [read slide]



# Kenosha Public Library

## Inspiration (Design Research: One to One Interviews)



Hi! My name is Henry. I am in the 4<sup>th</sup> grade. I am an Arduino junkie and I love complex math and I love to code! I know everything there's to know about circuits and I like working with other kids. I want to make clothes that when you touch it, it would connect directly to your brain so you can see things that aren't really there, like augmented reality.



The Inspiration phase is about listening, observing, and being open to the unexpected. Inspiration in design thinking is an active exploration.

So, to get inspiration, there are many approaches that one can take. Heather decided to conduct brief one-to-one interviews with some kids, just to generate ideas on what they like to make and why, for example, she asked them what they would like to do, what is their favorite subject, what they would like to make, if you could make one thing, what would it be?.....so I am just going to summarize two of the kids that she talked to. Meet Henry....[read slide]

# Kenosha Public Library

Inspiration (Design Research: One to One Interviews)

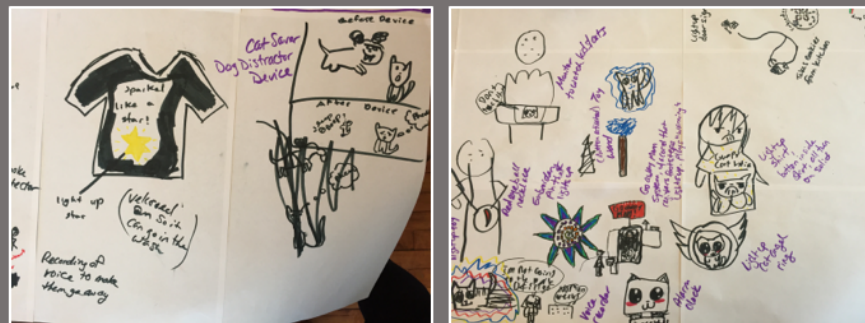
Hi! My name is Margaret. I am in the 5<sup>th</sup> grade. I love to sew and am totally into e-textiles, although I don't really know what that is! It sounds like I get to sew. I don't know anything about circuits. I like working with other kids. I think it would be fun to make a glow in the dark hat.



Meet Margaret! [Read slide]

# Kenosha Public Library

## Ideation (Design Research: Big Paper Approach)



Used with permission from: Heather Thompson, Kenosha Public Library



Now that she knows that e-textiles are particularly interesting for this age group, she started focusing on trying to figure out how she should run the session. This is the ideation phase. What facilitation and resources are needed to run an e-textile focused makerspace. She began the design session with four children different from the ones that she interviewed, by describing the basics of e-textiles, so they understand that these projects involve the use of fabric, batteries, and conductive thread. So, she is trying to figure out what prompt she should be giving and then also what resources they will need. She really didn't want them to be too concerned with the feasibility of what they want to make or the exact mechanics of how it would work. So, she asked them to ideate what they want to make.

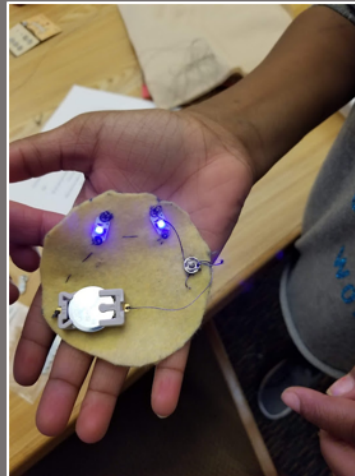
As you can see a lot of cat designs came up, and kids were focused on decorative items with cat themes.

On your right, you will see a design centered heavily around cats. In the picture on the right, you can see "Grumpy Cat" light-up shirts, light-up cat-angel rings, red cat's eye necklaces, a cat toy, a decorative light-up brooch, and so many other cat stuff. On the left side, another child did a decorative sparkly t-shirt, but made the point that the e-textile piece needed to be attached via a Velcro so that the t-shirt can go into the washing machine.

The big ideas that emerged from the children in this session were decorative e-textiles and things that are washable. It also appears that what they make is highly driven by interest in bling or cats. From this info, Heather started ideating the resources that she needed to have, like sewable Velcro, and also safety pins, etc. . She also knew that something that lights up was pretty popular. She also now knows the content and skills that she needs to give to them prior to letting them loose to make. And most importantly, she also found out what she needs to know so that she can help them make what they want.

# Kenosha Public Library

## Implementation and Iteration



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Kids learned the basics of hand sewing, how electricity flows through Circuit, and how to apply this to a design and create a project that uses conductive thread, batteries, LEDs, and others.

The pic on the left is the Rebel Alliance symbol from Star Wars. She was making it into a little pillow. The picture on the right is an emoji, you can use your imagination what emoji that is.

When I asked Heather, she said this is the prototype of the first iteration of the program, and, as she was doing this, she came upon another design challenge: Kids are scrambling to finish. So, her next design challenge will be to

# DT in Action

Governor Mifflin School District



GOVERNOR MIFFLIN  
SCHOOL DISTRICT



< libraries / ready to code >



The Governor Mifflin School District in PA received the Libraries Ready to Code grant offered by Google to allow students the opportunity to participate in observation and data collection about the feeding habits of birds that remain in Pennsylvania over the Winter. There are six bird feeders placed in four elementary schools for this purpose. The overarching goal is for the students to develop computational thinking skills – decomposition, pattern recognition, and abstraction of the data that they have collected. Students in grade 7-12 (20-22 kids from 1 middle and 1 high school) took students in grades 1-4 (24 kids from 4 elementary schools) “under their wings” to research local bird habitats, and collect data about their Winter feeding habits and to be citizen scientists. The older kids are tasked to create the technology that is needed for the younger kids to be able to be successful citizen scientists, hence they used the design thinking phases to inspire, ideate, and iterate the technology that they designed for these younger kids to be able to learn about the birds and collect data about the birds. Keep in mind that this project is still ongoing, but the first iteration was just completed.

# Governor Mifflin School District

Inspiration (Design Challenge)

## INSPIRATION

*I have a  
challenge.*

## DESIGN CHALLENGE

What type of technologies can the older kids identify/create that will allow the younger kids to become citizen scientists?



Read slide

## Governor Mifflin School District

Inspiration (Design Research: Contextual Interviews)



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HS/MS students conducted contextual interviews with the younger students, initiate problem solving, translate wonderings into “needs” that can be addressed with current technology. These older students were actually trained by their gifted teacher on the design thinking process.



## Governor Mifflin School District

Ideation (Design Research: Gallery Walk)



MOTION SENSORS

GAMES

WEBSITE



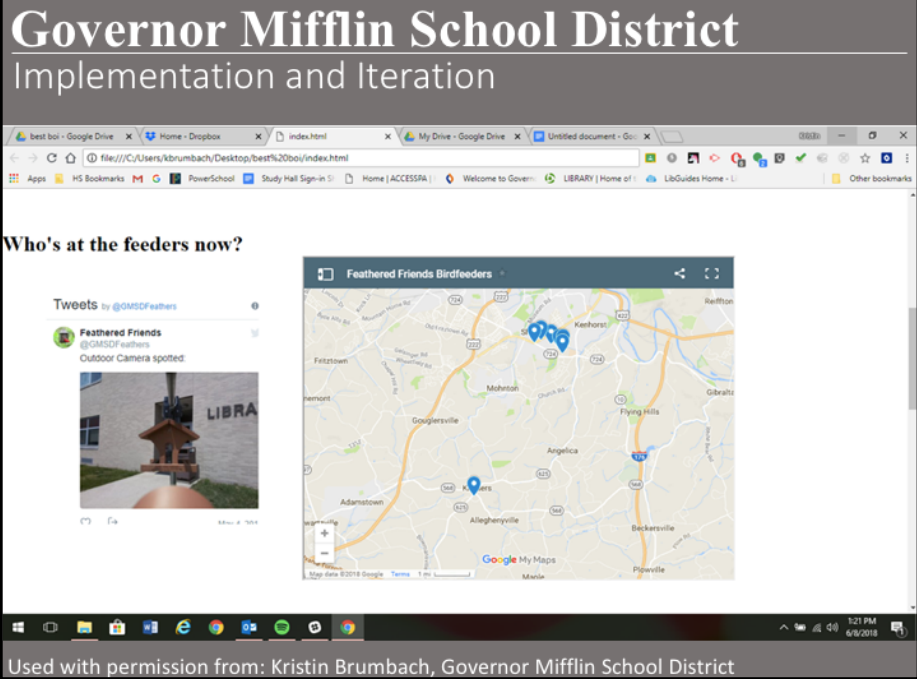
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From these contextual interviews, the team then brought back their notes to the library, and started building themes on big paper. There are three main themes that came up: The need for motion sensors to capture pictures at various sites where the bird feeders are placed. This was then connected to a camera that detects the motion sensor, and was done through the use of Raspberry Pi.

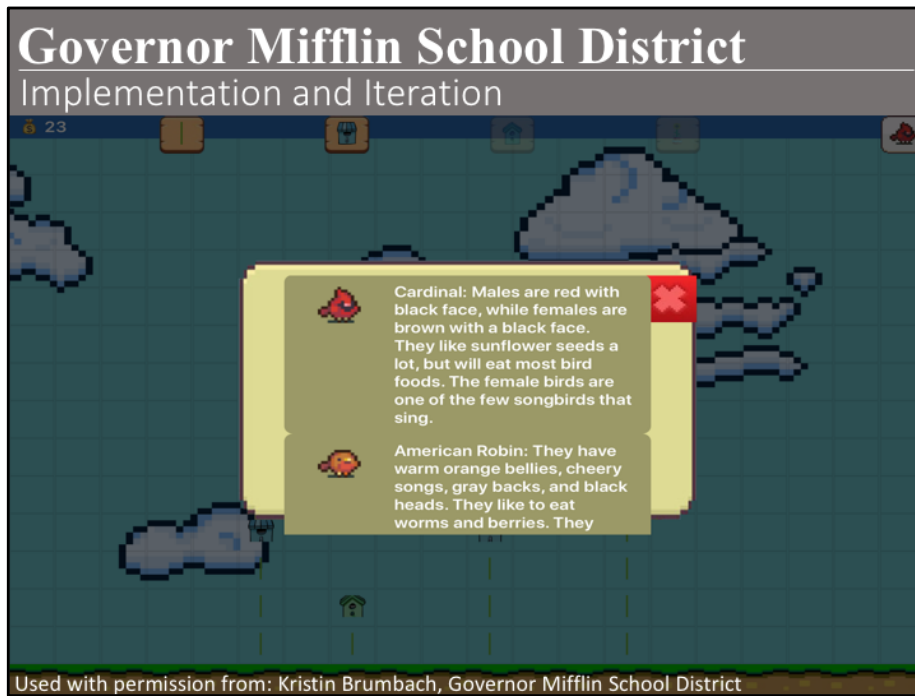
A game that gamifies the process of learning more about birds and types of birds in PA. Build their birdhouse and get birds to come, and once you get to a certain level, you get more birds.

A need for a website that serves as a landing page for the project, has a Twitter feed, and has a live feed of the birdfeeder, for the community.

Once these products were developed, then the older students also showed what they have done to the younger students to get more feedback through a gallery walk and obtained more feedback



Here is a screenshot of the website that was developed



A screenshot of the game.

## Design Thinking in the Academia Programs

### HOW MIGHT WE (HMWs):

- engage the entire College Park community to support emerging digital literacy programs for underserved young adults in the region?
- design a game-based learning program that encourages undergraduates to develop privacy literacy to protect the privacy of their personal information?



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DT can be used to tackle any challenges that all of you may face in the academy. The IDEO resource recommends that one can create what they call HMWs for library problems around programs, spaces, systems, and services. I took some of their questions and adapted it to the context of academic libraries. In terms of programs, some HMWs can be....[read slide...]

## Design Thinking in the Academia Services

### HOW MIGHT WE:

- create a user-friendly library that “brings the library to you wherever you are” that is on par with university students’ digital practices?
- provide relevant technical assistance to members of the university community who have disabilities, especially those members who are reluctant to ask for help?



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# Design Thinking in the Academia Spaces

## HOW MIGHT WE:

- create a “hanging out, messing around, and geeking out” library environment that encourages students to produce and create information and media?
- take advantage of unused space, or re-distribute space, so that students can discover more of what the library has to offer?



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# Design Thinking in the Academia Systems

## HOW MIGHT WE:

- design productive, mutually-beneficial partnerships with local schools, local businesses, other types of libraries, and other educational institutions?
- redesign library assessment so that our stakeholders understand the value and impact of the library in career readiness?



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## Design Thinking in the Academia – Why?

- Empathizing allows discovery of feelings and needs of the people that you are designing for.
- Landscape of learning and technology is rapidly changing. DT allows you to obtain community “voice” to offer programs, services, spaces, and systems that meet these changing needs.
- It is a scientific method, but inherently humanistic. Provides data on what your community wants that you can share with your supervisors.





# Acknowledgements

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- IDEO



# Thank You

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