OPEN DESIGN AT DUKE AND BEYOND

BASS CONNECTIONS 2019-20
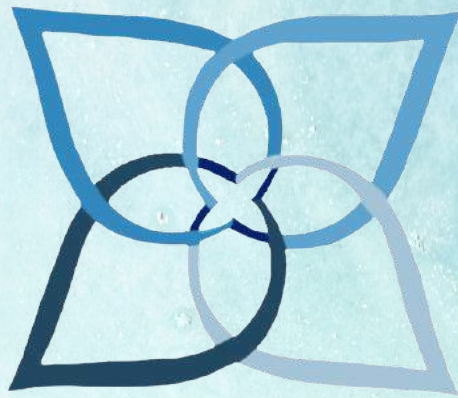
OPEN DESIGN

Contents

Project Description

This **Bass Connections** project offered students a rare opportunity to help **ideate** and build design experiences at Duke. Students gained content knowledge about **design thinking** and **human-centered design**, planned and executed a one-day design learning summit, built educational resources for use at Duke and beyond and helped design Duke's new **Open Design+** program. Given Duke's commitment to interdisciplinary thinking and inclusive action, the team built a design framework that is dedicated to an open ethos, to a design process that values and promotes **access to information**, **inclusion**, **diversity** and **transparency** and to **collaboration** and **community**. We call this brand of design **"open design."**

In this report, we shall discuss the journey of **Open Design at Duke and Beyond** Project team who worked effortlessly to understand the **needs of students and faculty members** at Duke to **conceptualize**, **design** and **develop** solutions that are focused on solving real-life problems. The team was broadly divided into two parts: **Team Students** and **Team Faculty**. **Section I** of this report focuses on problems and solutions defined by team Students to craft student-learning experience at Duke and design a Summer Program called **Open Design+**. **Section II** focuses on the work delivered by Team Faculty to improve the classroom experience for faculty members at Duke.

Meet The Team Leaders

Kevin Hoch
MEd, Education
BS, Health Sciences

"I design and build high impact learning environments. **Design**, **Innovation**, and **Entrepreneurial Action** are mindsets that I strive to empower students with. My goal is to impact our world through education and training our future leaders. My main role at Duke University is the **Managing Director of Education** in the **Innovation & Entrepreneurship Initiative**."

Aria Chernik
JD, Ph.D. English

"I am an **Associate Professor of the Practice** in the **Social Science Research Institute** and the **Innovation & Entrepreneurship Initiative** at Duke University, and **Founder and Director of Open Source Pedagogy, Research + Innovation (OSPRI)**, a cross-sector open education innovation initiative. My research and teaching focus on open education, design pedagogy, ethical technology, and equity-centered, problem-posing, and project-based learning innovation. "

Meet The Team

Faculty Contributors

Katharine Marie Amato
Senior Lecturing Fellow Duke I&E

Laura Howes
Director, Bass Connections

Graduate Team Members

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Master of Engineering
Management

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Undergraduate Team Members

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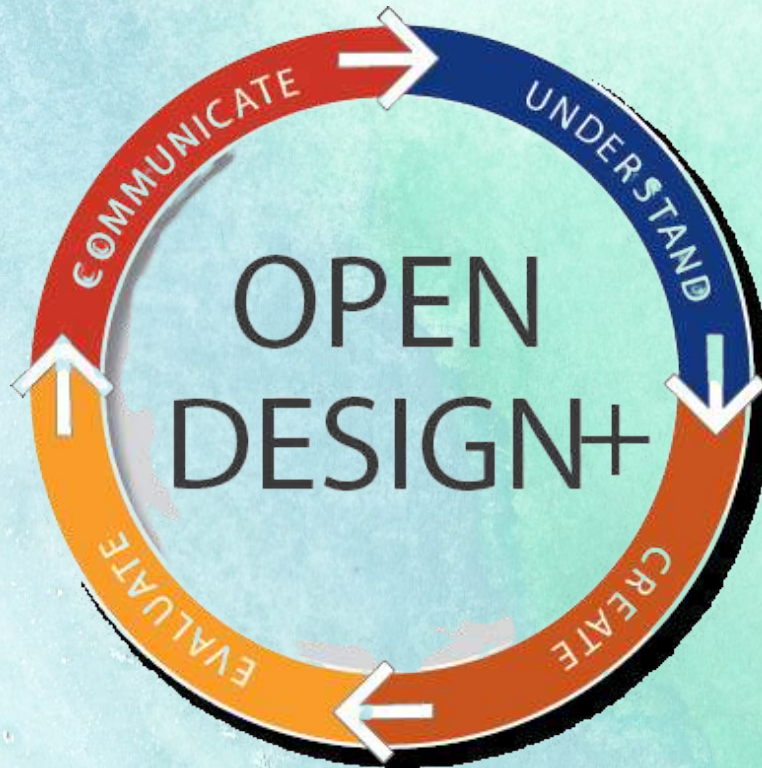B.S. Psychology & ISS Certificate
Trinity Class of 2021

Jodi Yeh
B.S Computer Science, Minor Economics,
Undergraduate, Class of 2022

Daisy Wang
Economics and Cultural Anthropology
Undergraduate, Class of 2022

Executive Summary

Introduction: When we hear the word "**design**," we often think about a product: the features of a technology, the look of a space, the integrity of a structure. But design also refers to a process that can be used by teams to solve **deeply complex**, **real-world problems**. And because the design process (sometimes called design thinking or a variation referred to as **human-centered design**) asks us to learn and demonstrate essential 21st-century skills – like **collaborating** with **stakeholders**, **communicating** across media, **analyzing** data and **iterating** forward, thinking boldly and creatively in the face of uncertainty – more people are starting to think about how a design mindset can be integrated into educational contexts.

Research and key Insights: This report focuses on the four phases of design thinking process, namely, Understand, Create, Evaluate and Communicate. The first phase engaged the team members into a lot of qualitative and quantitative research using methods like empathy interviews, field studies, surveys and observations. After gaining enough knowledge about the user (Duke students and faculty), team used the principles of design thinking to ideate, prototype and communicate their solutions- **Design Consultant** and **Pop-up-design sprint** for Duke students and **opportunity based assignments** for Duke faculty. The key insights gained from this process are- always putting user at the center, keeping aside personal biases and asking open-ended questions during exploratory research, following a 5-why approach to understand the problem space and ensuring quantity over quality while brainstorming ideas.

Recommendations: The team designed solutions that have a strong relevance to problems existing in real-life education and learning space. The **Design Consultant** concept has the capacity to bridge tha gap between student-faculty collaboration through continuous testing and evolving. The **pop-up design sprint** is a great way to introduce design thinking to students at Duke and provide an open platform for them to share problems and needs in academia. Opportunity based assignments is a novel way to assess and quanitify student learning. Not only will it enhance practicality of assignments, but also make grading feel purposeful, beyond just assigning a letter grade to students.

UNDERSTAND
Empathize | Define

Defining the stakeholders

The very first step of the understand phase of design thinking is **identifying** and **defining** the **stakeholders**. The open design team started by listing down all the stakeholders in the form of a stakeholder map and used the technique of affinity mapping to categorize them into **buckets** or **themes**. This included undergraduate and graduate students, faculty members and several student organizations at Duke, with and without design thinking association. The stakeholder map also included people from several corporate entities like **IBM**, **RedHat, Durham Innovation Center** and **IDEO** where design thinking is at the heart of innovation.

The major learning outcome of this activity was, it is important to talk to a lot of people but what is even more important is to talk to the right set of people. Talking to stakeholders laid the foundation of our **qualitative research** and it was essential to gain useful **behavioral insights** to lay a strong foundation for the solution that the team would design in the forthcoming phases- **CREATE**, **EVALUATE** and **COMMUNICATE**.

The stakeholder definition is broken down into two parts. The next two pages illustrate **student and community** stakeholders and Section II of this report illustrates the stakeholder map of **faculty** members at Duke.

STUDENTS

KEY TAKEAWAYS

Want **active** and **creative learning**
(as well as more collaboration insight into what they want to do in the future for careers)

Value **diversity** in academics and experiences
(without the fear of grades)

Desire **Real-world design** application

PAIN POINTS

Lack of **interdisciplinary** engagement

Lack of appropriate **classroom support** and **curriculum resources**

Lack of **collaboration**

Lack of support for academic **exploration**

Lack of **Design** at Duke

"For academic exploration, I do not see a lot of people doing that. People would rather take an **"easy A"**, so I wish curriculum was **structured** to **actively push** back against that idea and **encourage more exploration**"

"We felt like we were wasting time. We're in this program [Code +] to learn, but we just ended up **arguing** over ideas **instead of building each other up** and **learning to actively collaborate**."

"What I really liked about the program [Data +] was the **wide diversity** of projects that appealed to a **broad range of interests** and majors. It gave me the opportunity to branch out and **explore without worry about grades**"

37 interviews

TRINITY COLLEGE OF ARTS & SCIENCES

INNOVATION CO-LAB

SANFORD SCHOOL OF PUBLIC POLICY

DF★A DESIGN for AMERICA

DiDA

Duke | PRATT SCHOOL of ENGINEERING

DUKE FUQUA SCHOOL OF BUSINESS

COMMUNITY

KEY TAKEAWAYS

Concept of design thinking and open culture will be confusing to someone **unfamiliar** with both

Learn design by **doing**

(fail fast)

Online Tools

(Mural, GitHub, OpenSource Repo)

Prototypes should look **incomplete**

PAIN POINTS

Community partners feel **burdened** when working with **inexperienced students**

Partnerships between Duke students and community partners are often **structured around** the **convenience of the student**

Design thinking is **difficult for introverts** who find it hard to **express** their **opinions**

"We use design thinking for almost every problem. What's so cool about it is that **anyone can do it**." - Design Lead, IBM

"The most important thing is to **understand** who you're designing for." - Design Lead, IBM

"I think the biggest transition is going from having some direction from a manager about how you spend your time, to understanding the challenge at hand and **figuring out what skills and experience you have that can contribute** to moving the work forward." - Business Designer, IDEO

CITY OF **DURHAM**

IBM

DF★A DESIGN for AMERICA

red**hat**

10 interviews

As mentioned in the beginning, this report is divided into two sections, Section 1 talks about **problem space** and **solution space** discovered by **Team Students**. This section is further divided into two sub-sections called **Design Consultant** and **Open Design+**, depending on the solutions developed by the teams. Please note these sub-sections focus on solving two different problems.

Sub-section 1, Design Consultant, focuses on defining student problems and needs and designing a solution that can help students **craft their own learning experience** at Duke. On the other side, sub-section 2, Open Design+, focuses on understanding problems of student participants in Duke's summer programs and further talks about designing a summer program called Open Design+ using the concept of pop-up design sprints.

Section I of this report talks about the experiences and learning of Team Faculty to support Duke faculty members in their efforts to provide accurate assessment of student learning. It illustrates a detailed view of the proposed solution called Opportunity based assignments. For in-depth read, please navigate to Section II.

Team students - Design Consultant
Empathy Journey Map

Identifying Stakeholders

The first step in our empathy journey was identifying stakeholders. Stakeholders included people with insight or experience in our research area (design thinking and higher education strategies or spaces) as well as people who might be impacted by our future research and design solutions. Individually, we identified potential stakeholders. Together, we organized them into groups:

(1) **undergraduate** and **graduate students** with various academic backgrounds and design experience,

(2) **Duke community** and **student organizations**, and

(3) **academic administrators** and **professors**.

In empathy journey map visual given on Pg. 15, the numbers indicate the number of individuals who fall into the respective categories. Some people fall into multiple categories, so they were counted twice (e.g. an undergraduate student who is president of a student organization).

Interviewing Stakeholders

Once we identified stakeholders, we contacted individuals for an interview. Before conducting the interviews, our team created a guide for how to introduce ourselves and the project, tips for "**breaking the ice**," and relevant questions

IDENTIFYING STAKEHOLDERS

20 Undergraduate and graduate students with various academic backgrounds and design experience

6 Duke community and student organizations

4 Academic administrators and professors

Let the interviewee lead the conversation

Lean into the silence and see what other stories come up during these moments

Be open to having your assumptions challenged and maybe debunked!

Reflect on the interviewees' responses before jumping to solutions

INTERVIEWING STAKEHOLDERS

What did we learn?

What is Design Thinking?	Lack of Design at Duke	"There is no design department and few classes introduce the fundamentals of design thinking."
Classroom and Curriculum	Active and Creative Learning	"Before thinking of solutions, think about people who will be affected. Important to realize solutions will be formed from personal identities and bias."
Collaboration	Real World Design Application	"How do you make these classes relevant to the real world or relevant to what is important in the development of being a student?"

HOW MIGHT WE use design thinking to help students craft their learning experience at Duke?

SYNTHESIZING PROBLEMS + NEEDS

Process:
Brainstorming and Prioritization Grid

Challenges + Learnings:

Navigating through the ambiguity

Trying to understand our HMW statement in the context of our interviewee findings

Co-creation and external feedback are necessary to measure success and create an effective solution

IDEATING SOLUTIONS

to ask. Interviewing people was a new experience for us, and our personal learning is outlined in the journey map.

Synthesizing Problems and Needs

After interviewing our stakeholders, we **synthesized** our **users' problems and needs**. We wrote our findings on **sticky notes** and then **organized** them into **6 major themes** and **stories**, which are listed in the yellow squares in the **empathy journey map** given on the previous page. The three problem spaces with the most insights were **Lack of Design at Duke**, **Active and Creative Learning**, and **Real World Design Application**, so we included an interviewee's quote for each of them (located to the right in the pale yellow rectangles). From these insights, we came up with our **HMW statement,** given below.

How might we use design thinking to help students craft their learning experience at Duke?

"The most prominent needs were learning skills that could be applied in "real-world" opportunities and resources to practice the design process, and more integration of active and creative learning methods. Identifying the problems and needs that stood out the most helped us to define the problem we wanted to solve around Duke student learning."

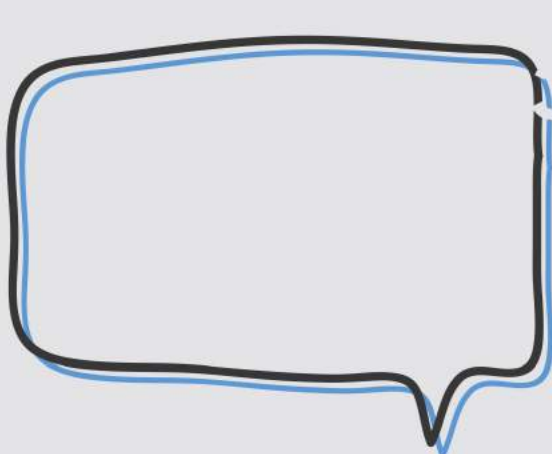# PROBLEMS & NEEDS

of Duke Student learning

CLASSROOM & CURRICULUM
A classroom that actively

adapts

REAL-WORLD APPLICATION
Learn skills that transfer to

professional goals

LACK OF DESIGN THINKING
Not enough opportunities

for students to engage with

the design process

ACTIVE & CREATIVE LEARNING
Engage students through diverse and interactive methods

COLLABORATION
Practice engaging with stakeholders in different situations

UNDERSTANDING DESIGN THINKING
Apply design thinking to different areas of interest

Priortization Grid

Ideation

The final step in our empathy journey was **ideating solutions**. Guided by our **HMW statement**, we **brainstormed** any and all **potential solutions**, ranging from a **collaborative syllabus** to **coffee chats**. At times, we felt lost amidst all the interview data, but a **prioritization grid** helped us to identify which idea would be most **helpful to the user** and **feasible to our team**. Once we identified this idea, we relied on **co-creation** and **external feedback** to navigate through the **ambiguity** and ensured that our solution was addressing the needs of our users.

# Team students - Design Consultant
Persona

What is a Persona?

A Persona is a **fictional character** that helps all team members to **demonstrate the characteristics of the user**, the **pain points** that they're focusing on and the **goals** that they're trying to accomplish through the solution. Team students designed a persona called **TaraKa**.

More about TaraKa:

TaraKa is an **undergraduate student** who is interested in exploring the field of **student learning innovation**. She loves **challenging her abilities** and solving complex problems at hand. Having diverse interests and an inquisitive mind to try new things, she aims at learning **hard skills** that enable her to **solve real-world challenges.** She also feels that students should have a greater **voice** or **opinion** in outlining their classroom experience.

Why did we design a persona?

Persona is one of the most powerful tools used at all stages of the design thinking process. Building personas at an early stage provided more clarity to our concept and helped us understand our users better. Enlisting the basic characteristics of the user, defining the needs and highlighting the major pains was a great way to explore the
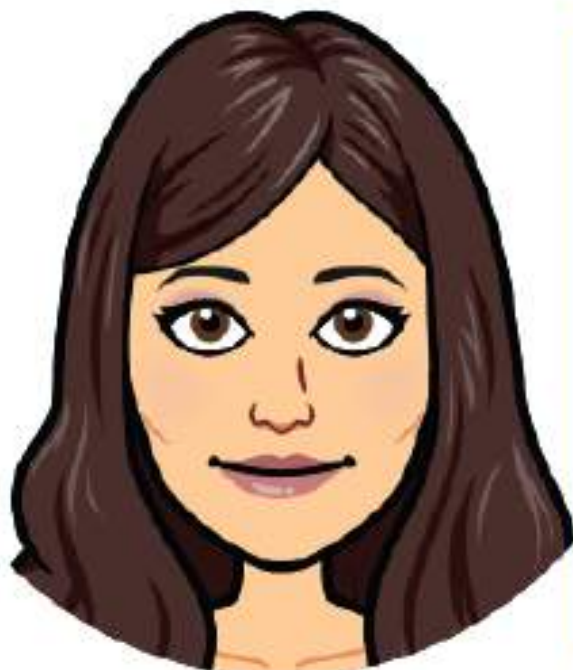
TaraKa

Passionate around bridging stem and the humanities

Age: 20
School: Undergraduate at Duke University
Study: Interdisciplinary Major
Interests: design, cooking, going out with friends, exploring Spotify for new music

Diverse Interests

Learns by doing

Values Extra-curriculars

Interpersonal

Discovery by trial and error

Inquisitive

Major Goals

Real-world skills

"What can I do with this knowledge after this class ends?"

Creative Communal Learning

"How can I unleash my creativity, make it fun?"

Student Initiative

"Hard to feel like I have a voice as a student"

problem space and understand the goals of the user for whom the solution is being designed.

How did we make a persona?

We generated a lot of behavioral data by doing extensive qualitative research during the '**Understand**' phase. A multitude of research methods were used namely **ethnographic interviews**, **field studies**, and **observations**. Following this, we organized our data into several themes using a technique called affinity mapping and this laid the foundation of our persona. Our persona is based on one theme (**Active and Creative learning**) that was prioritized by the team, keeping in mind all the users we interviewed. Our persona is a reflection of our problem statement defined as "**How might we use design thinking to help students craft their learning experience at Duke?**"
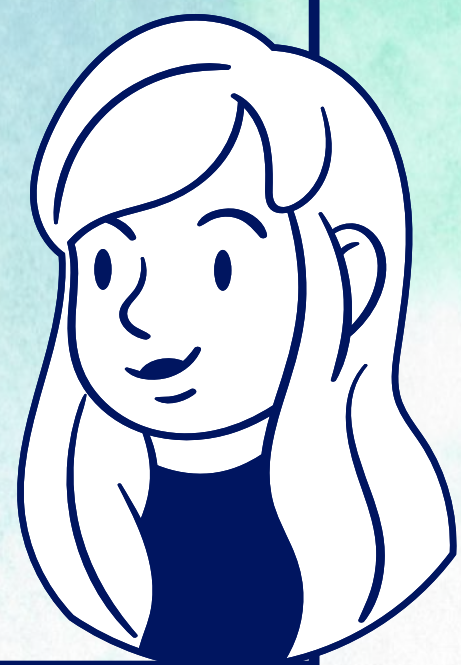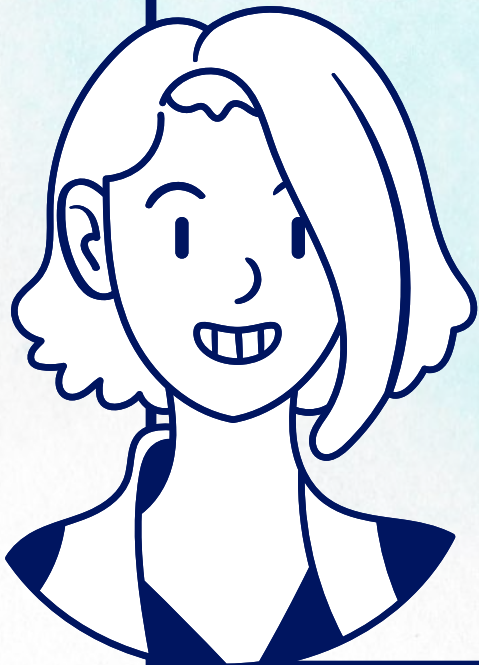
Team students - Open Design +
Empathy Journey Map

As discussed in the last section, one group of students focused on enhancing Duke students' classroom experience by understanding the pressing problems and prototyping a solution called **Design Consultant**. Another group of students focused on understanding the problems around Summer Programs at Duke and bringing out the best desirable, viable and feasible solution to be practiced in Duke's new Summer Program called **Open Design+**. The team who worked on this solution likes to be addressed as **DDMF+** (Design, design my friends!). You may come across this term quite often in this report.

Let's start by understanding the **empathy journey map** of team **DDMF+**.
Our Empathy Journey Map depicts the steps we took to get to our final prototype:

- **Identify**
- **Interview**
- **Synthesize**
- **Ideate**

First, we took sticky-notes and thought of different groups of people that could have **interesting perspectives** or **feedback** to contribute to the creation of Open Design+.

DDMF+

EMPATHY JOURNEY MAP

STEP 1
IDENTIFY

Created the Stakeholder Map and determined which ones were most relevant and feasible to Design +

STEP 2
INTERVIEWS

Interview process: in groups of two, interviewed 35 people including faculty, + Program participants, and Durham community partners.

STEP 3
SYNTHESIZE

Takeaways:
1. Students need to make time for Stakeholders, not stakeholders need to make time for students
2. Fail Fast
3. Design thinking translates into the physical work space

Pain Points:
1. Lack of proper guidance
2. Team members not comfortable with each other
3. Engaging students throughout the process

STEP 4
IDEATE

BC Plaza Prototype:
Day1: Students participate in design thinking through answering a general question
Day2: Select a couple themes from the prior day's answers for students to target and delve into pain points
Day3: Students ideate about one of the problems leading into a separate design thinking sprint

We sorted these groups and began to conduct our next phase, **the interviews**.
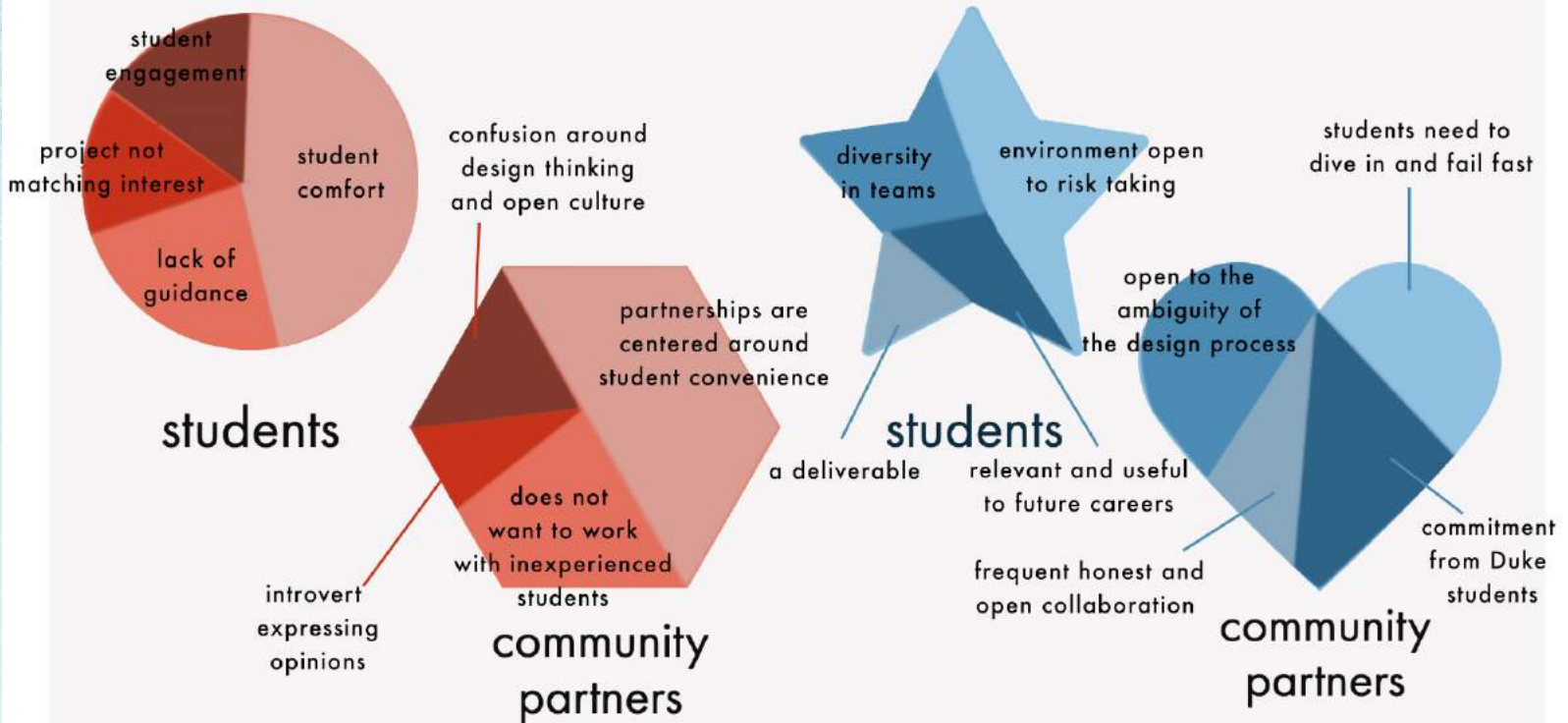
Alongside + program (**Data +, Story +, Code +**) students, we pinpointed what students looked for in a program and if the **need for Design Thinking** was present. We spoke to **faculty** members involved in the **+ programs**, **graduate design thinking professors**, and **design thinking professionals** at large corporations (**IBM, Redhat, IDEO, the Durham Gov't**, etc).

After gathering over **35 interviews**, we synthesized the data into our **key takeaways** and **pain points**. Our findings centered around three key themes:

- First, **students need to make time for stakeholders**, not stakeholders need to make time for students.
- Second, students need to **fail fast**, meaning **do not be afraid to fail** and **don't hold back**.
- Lastly, design thinking translates to the **physical workspace.**

On the other hand, our interviewees struggled with a lack of guidance in the + programs, team comfort, and staying engaged which is depicted in the **problems and needs info-graphic** given below:

PROBLEMS AND NEEDS

student engagement

project not matching interest

student comfort

lack of guidance

students

confusion around design thinking and open culture

partnerships are centered around student convenience

introvert expressing opinions

does not want to work with inexperienced students

community partners

diversity in teams

environment open to risk taking

students need to dive in and fail fast

open to the ambiguity of the design process

students

a deliverable

relevant and useful to future careers

frequent honest and open collaboration

commitment from Duke students

community partners

The Problems and Needs Infographic made our team weigh each **takeaway** and **pain point** of every group we interviewed. It helped us differentiate the difference between a problem, **desires rather than essentials**, in contrast to a need, **crucial to success**. We separated our interviewees into two groups: **students and community partners**. When analyzing the graphic, the size of the splits of each shape represents the importance of the value.

First **analyzing the problems of students**, **student comfort** in a team held the most weight, followed by **lack of guidance, engagement, and finally, a project not matching**
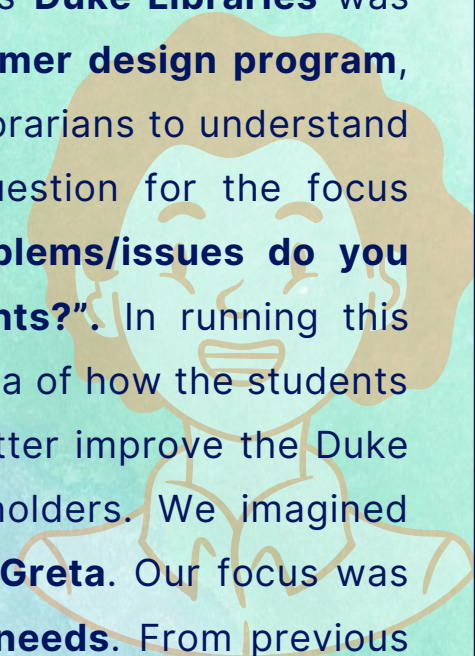
one's interest. Further examination identified the needs, pivotal to accomplishing the **student's goal**. Most importantly, they needed an **environment supportive of risk-taking**, and then **team diversity**. Subsequently, a project should be relevant or **useful to future careers** along with having a **deliverable** to represent one's work.

As for **community partners**, the biggest problem was that partnerships were centered around students. Issues arose about **students' inexperience**, **confusion about design thinking**, and more personally, about **introverts not expressing opinions**. Community partners required students to be willing to **"fail-fast,"** as mentioned in the Empathy Journey Map, and equally important, **commitment from students**. It is essential that community partners are open to the ambiguity of the design process as well as partaking in frequent, **honest feedback**.

Our last step, **ideate**, compiles these difficulties and takeaways into a **prototype: the Pop-Up Design Sprint**. Designed to take 3-days, people can gain exposure to **Design Thinking naturally**. On **day one**, the crowd will participate by answering general questions. **Day two** consists of common themes from the prior day's answer, similar to how we sorted the different groups of people in our first step. The **final day** ties it all together with ideation, leading into a separate **Design Sprint**.

Team students - Open Design +
Persona

For our persona, we chose to illustrate our second concept pitch, which was centered on **creating a stakeholder focus group with the librarians at Duke**. As **Duke Libraries** was one of the **stakeholders** for the **summer design program**, we wanted to provide a way for the librarians to understand how Design Thinking works. Our question for the focus group would have been **"What problems/issues do you have with collaborating with students?"**. In running this **focus group**, we would also get an idea of how the students in the program would feel, how to better improve the Duke community's relationship with stakeholders. We imagined our **Persona to be a librarian** named **Greta**. Our focus was to highlight **Greta's frustrations** and **needs**. From previous interactions with librarians, we were able to highlight Greta's predicted feelings of **helplessness** in the **age of technology**.

Many of the library's easily accessible online resources have diminished the role of the librarian, **creating a need for librarians to be able to show their utility to students**. Whether that is creating a new role for themselves that works in **tandem with technological advances** or **providing other avenues of support for professors and students**, it was evident through our brainstorming that Greta needed a **newly defined role**.

CREATE
Ideate | Prototype
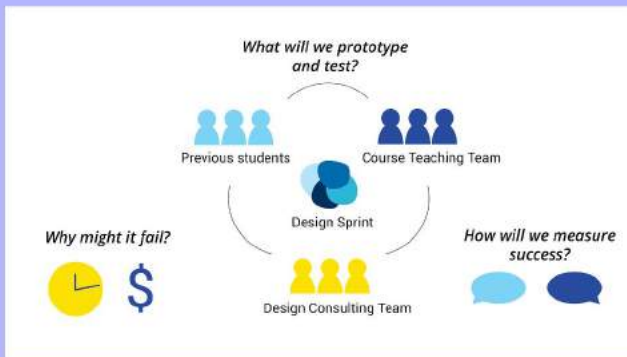
Prototype Evolution - Design Consultant

S**tage 1:** After defining our concept at depth, it was time to design a **low fidelity prototype**. Prototypes are a great way to demonstrate your concept and **gain feedback from users** for **constant evolution** and **enhancement of the solution**. Our **first draft** was a **simple paper-pen prototype** defining the **features of our solution** called The **Design Consultant**. This is illustrated in stage 1 of the flow diagram given on next page.

Stage 2: The next stage saw the emergence of a **digital prototype** describing the **user of our concept** and how the solution would help in solving the problem defined in the **"Understand"** phase focused on **helping students to craft their learning experience at Duke**. This led to the concept of a **Design Consultant**, an undergraduate student working part-time, **acting as a liaison between students and faculty members**. The design consultant would use the process of design thinking to **better understand students' needs, help faculty members explore the problem space** and **re-design classroom experience for students.**

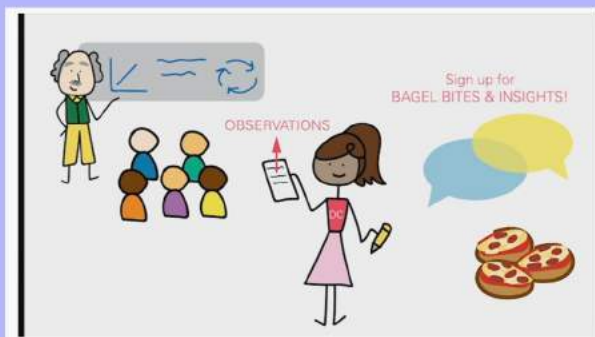**Stage 1: Pen-paper low fidelity prototype**
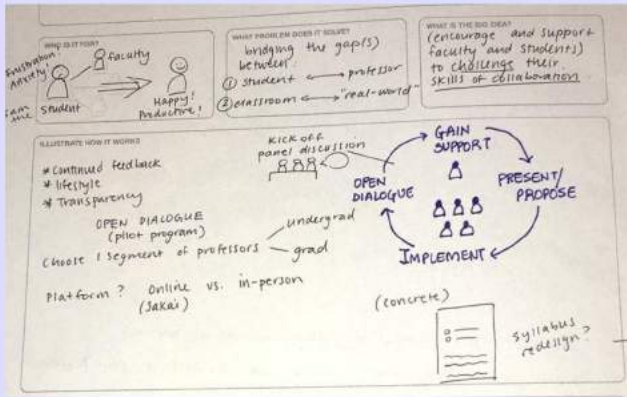
Stage 2: Digital concept prototype

Stage 3: Hand-drawn storyboard

Stage 4: prototype video

https://www.youtube.com/watch?v=JdY1sGb1m_Q&feature=youtu.be

Stage 3: After enough brainstorming around the solution of a design consultant, team students decided to hand-draw a **6-frame storyboard** to demonstrate its detailed working and potential outcomes. The intent was to communicate our concept in the most simple and comprehensive way to our users who could help us improve our prototype over the course of time. This can be seen in stage 3 of the flow diagram given on Pg 33.

Stage 4: In the final stage, the prototype took the shape of a video wherein all the frames of the storyboard were narrated by a human voice. The intent was to make our prototype more interactive, interesting and fun to watch. It encapsulated all the necessary details required for our audience to understand. This is the beauty of the prototype, it should be novel but at the same time, comprehensive and easy to use. To take a glance at our final prototype, please click on the link given below:

Team students - Design Consultant Video Prototype

Prototype Evolution - Open Design+

Our **first prototype** was for **making students aware of the design thinking process**. It included **three sprints** and the key stakeholders were **community partners** and **students**. **Sprint 1** would have a problem statement from an imaginary world where teams would be given certain roles. This was to make the students comfortable with the design thinking process and encourage them to put forward the most random ideas. **Sprint 2** would have a more realistic problem statement so that the students would get an idea of how to deal with actual clients. Here random teams would be interviewing each other as they would be the stakeholders for different teams. In **sprint 3,** teams would lead their own design sprints to make their concepts of design thinking stronger. The actual client of all teams would be revealed at **"Design Gala".**

Our **next prototype** was the **"Pop-up design Sprint"** on BC Plaza which would be a **three day design sprint** in which students would participate in the design thinking process to get more familiarity of the concepts. **Day 1** would be a generic problem statement where students would post their ideas. One problem from Day 1 would be chosen for **Day 2** (the most common one) and students would put the **related pain points.**

What problems do you face at Duke?

Day 3 would be **ideating** which would then lead to a separate workshop. This is all we had thought about when we first planned this prototype. After conducting a mock trial of this in class, we decided to **take surveys to find the interests of the students.** We would also **keep stickers** and **flyers** to give the students more information about the program and other **design thinking courses** which would be conducted in the next (fall) semester.

EVALUATE
Test | Iterate
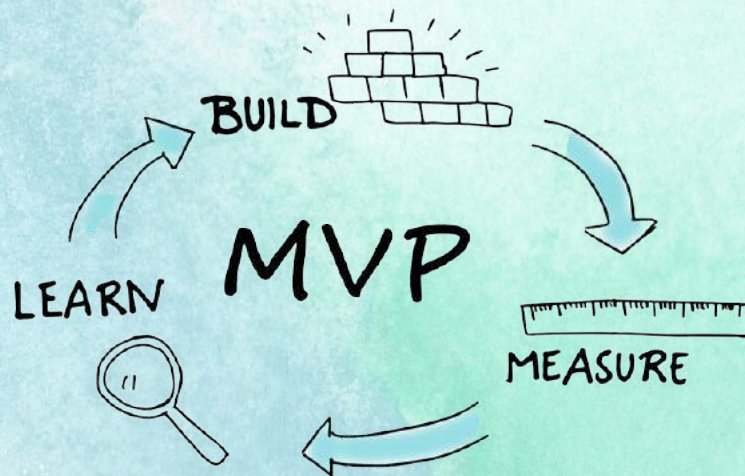
The **Evaluate** stage is one of the most critical stages of Design Thinking process. It involves **Testing the prototype and then constantly improving it in iterations**. The process of testing the prototype can be broadly divided into two parts:

- Testing with the team (otherwise called, **Alpha Testing**)
- Testing with the stakeholders (also called, **Beta Testing**)

Feedback from both the **internal team members** as well as **external stakeholders** is essential to determine if we're heading in the right direction with our solution. Unless we have a prototype which solves a real problem, it is highly unlikely to **gain traction from the stakeholders**.

The team re-engaged with several stakeholders to **seek feedback and measure the value as perceived by them**. The next step was to learn how to **incorporate** gained feedback into the prototype to **create a high quality MVP (Minimum Viable Product).**

As discussed in the Create Stage, there were different stages of the prototype and at every stage, the team performed **alpha and beta testing to continuously seek feedback, both positive and negative** and improve the solution in an iterative fashion. For example, for the design consultant prototype, some of the concerns heard from the stakeholders themed around **faculty interest level**, **interest and design thinking proficiency of design consultant**, **how to fit the prototype in the current organization structure** or **teaching team** and **excitement around a new work opportunity for students**.

This enabled the team to dig deeper to list down all the attributes of their prototype and **fix the flaws** much before the prototype is made public. Evaluate phase helped the team to **measure the success of their solution** by directly testing with the stakeholders. This stood as the key factor to building the most desirable solution.

COMMUNICATE
Connect | Influence

Recommendations - Design Consultant

Our prototype, the Design Consultant, aims to bring design-thinking to the classroom by **identifying student needs**, **facilitating a creative space** for brainstorming potential solutions, and **integrating real-time feedback** to implement effective and practical improvements. This prototype is based on research that we gathered from **user interviews**. Talking to fellow undergraduate and graduate students about their learning experiences at Duke, we saw **a need for design thinking resources**, **spaces for active learning** and **collaboration**, and **opportunities to apply classroom learning to real-world situations**.

The Design Consultant hopes to address these major needs by using the design-thinking process, students and faculty will learn how **design can be used as a method for innovation and growth**. By communicating with the Design Consultant on a regular basis and sharing their insights, students will play an active role in their education experience. If there are certain topics that students want to address in their classroom, **the Design Consultant can help build those connections** between the **course curriculum and real-world happenings**.

Although we conducted some preliminary testing before the semester's end, we recommend that further **testing and co-**

creation be completed to ensure that this solution is of most **impact to the user** and **feasible for the team.**

The video can be presented to other users and stakeholders, including students, faculty, and other members of the academic departments or administration at Duke. **Collecting** their **feedback, both positive and negative**, is essential to evaluating the **potential success** of the prototype. Questions to consider include:

- Is there enough interest in creating the role of a Design Consultant?
- Are there faculty members willing to bring another member to their teaching team?
- How do students feel about the Design Consultant's role and function?
- What aspects of the prototype are difficult to understand or implement?

Answering these questions can help determine if the best step is to **continue iterating the Design Consultant prototype** or not. If not, we recommend returning to the research phase: **identify additional stakeholders** to talk to, **gather new insights**, and **synthesize the new findings** with those from our **past interviews.**

Aside from presenting the video prototype for feedback, we also recommend running a pilot test with a faculty member who is willing. Contact multiple professors to gauge interest in the prototype and the possibility of dedicating one class meeting to a pilot test. If there is a professor **open to the idea, collaborate with them in designing a one-day design thinking sprint with his/her students**, centered around the question of **"How would you redesign this class experience?"** After completing the design sprint with his/her students, interview the professor and the students to collect feedback on their experience, as well as the video prototype if time allows.

Best,
Team Students- Design Consultant, **2019-2020**
Tarunam, Karissa, and Rachel

Recommendations - Open Design+

Our **Pop-up design sprint prototype** was geared towards making students aware of the design thinking process by implementing a **three-day long open design sprint**. On day 1, students would give their opinions via sticky notes on a whiteboard for a question we posed: **"What would you improve at Duke?"**. On Day 2, we will have **pre-selected themes from prior day's answers** for students to target and delve into pain points. On Day 3, students would **"ideate" about one of the problems leading into a separate design sprint.** To better introduce Design Thinking to the public, we would also create flyers and stickers to communicate the **Open Design+ program**, **what Design Thinking is**, and **how to get involved**. The flyers listed future classes involving design thinking, a**n explanation of this Bass Connections team**, and social media/listserv sign up to stay in the loop.

In terms of next steps regarding our prototype, we were unfortunately never able to physically carry out the BC Plaza design sprint due to the semester being cut short by Covid-19. However, **we believe that idea still holds a lot of potential and would recommend future iterations of either this Bass Connections or Open Design + summer program members carry out our prototype.** We would recommend

partnering with **Duke's Fix My Campus community** and the **Duke Student government** in order to publicize the event as well as assist implementation of the solution possible. We also recommend having the **pop-up design sprint at BC Plaza** serve as an introduction or hook into a more in depth design thinking workshop. For students that were particularly interested in the project, we believe having a **design thinking workshop** soon after the plaza demonstration would be a great way for students to carry out the remaining stage of the design thinking process that would have been difficult to do on the BC plaza.

Best,
Team Students - Open Design +, 2019-2020
Jodi, Daisy,Jeel and Lydia

RESOURCES

Related Duke Organizations & Spaces

Duke Learning Innovation

Inside Education

Duke Innovative Design Agency (DIDA)

Design for America (DFA)

Student support organizations

Duke Reach

Duke Student Affairs

Duke Student Organization Finance Committee

Duke Student Government

List of stakeholders/ external partners:

- Patrick G Nyeste : pgnyeste@us.ibm.com
- Kimberly Holmes: holmesk@us.ibm.com
- Erin Parish: erin.parish@durhamnc.gov
- Paul Bendich: bendich@math.duke.edu
- Jen Halls: jenkhalls@gmail.com
- Amanda Gould: amanda.gould@duke.edu
- Katie Gray: kaltmann@redhat.com

Professors/faculty

- Ann Saterbak - Professor of the Practice in the Department of Biomedical Engineering

- Launched a new first-year design course for engineering students
  - Research interests include "innovations in undergraduate engineering education, particularly new pedagogical methods that broaden students' problem solving skills and design thinking"
- Mark Olson - VMS professor and DUS
- Victoria Szabo - VMS professor

Duke alumni

- Kim Huynh - Duke 2020, product designer at Facebook
- Vivian Wang - Duke 2019, product designer at Capital One

Additional Resources

Resources from Summer 2019 Research

- IDEO
  - Design Thinking for Educators Toolkit
  - Field Guide to Human-Centered Design
- IBM
  - Design Thinking Framework
  - IBM Design Thinking Toolkit
- Stanford d.school's How We Do It
- Khan Lab School Approach to Learning
- LUMA System of Innovation

Open Design @ Duke & Beyond: Improving the Classroom Experience For Faculty

By Maria Lulo,
Matthew Lanza,
and Paige O'Leary

OPEN DESIGN

Table of Contents

Understand

## The Users: Duke Faculty & Students

Our team started by talking with faculty, but quickly realized that the biggest pain point for faculty had to do with their ability to assess, connect, and engage with their users (i.e., students).

The Problem

In order to address faculty concerns we had to figure out the problem we were trying to solve. Based on interviews conducted throughout Fall 2019 – Spring 2020 we decided on the following:

A Faculty Member who feels hesitant/not confident about assessing student learning and needs to make class assignments and activities more purposeful, but faces a lack of incentives and/or resources to do it.

Our team began to interview faculty members across Duke with this problem in mind. The following persona graphic, customer journey map, and empathy journey map explain some of our findings.
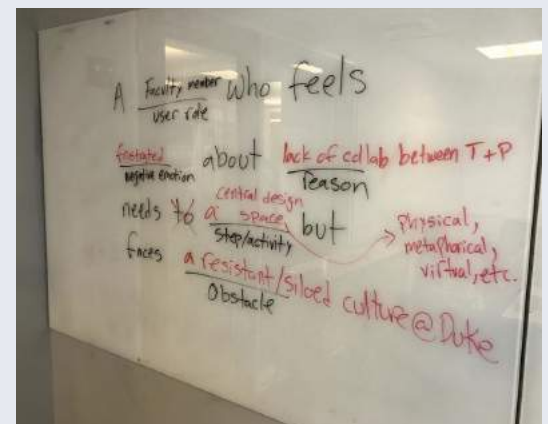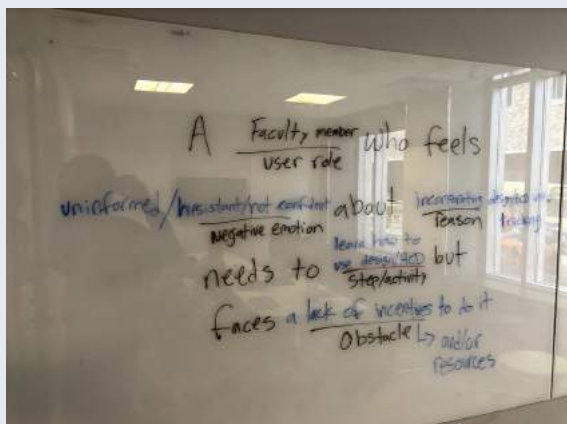
Persona Infographic
Ruebe the Researcher

Tenure Track Professor

Ruebe has been at Duke for a few years and is very active in her field as an expert and researcher. She enjoys teaching and interacting with Duke students. "They are all so bright and engaged," Ruebe might say. She enjoys teaching classes that are focused on topics she loves and keeping up with new developments in her field.
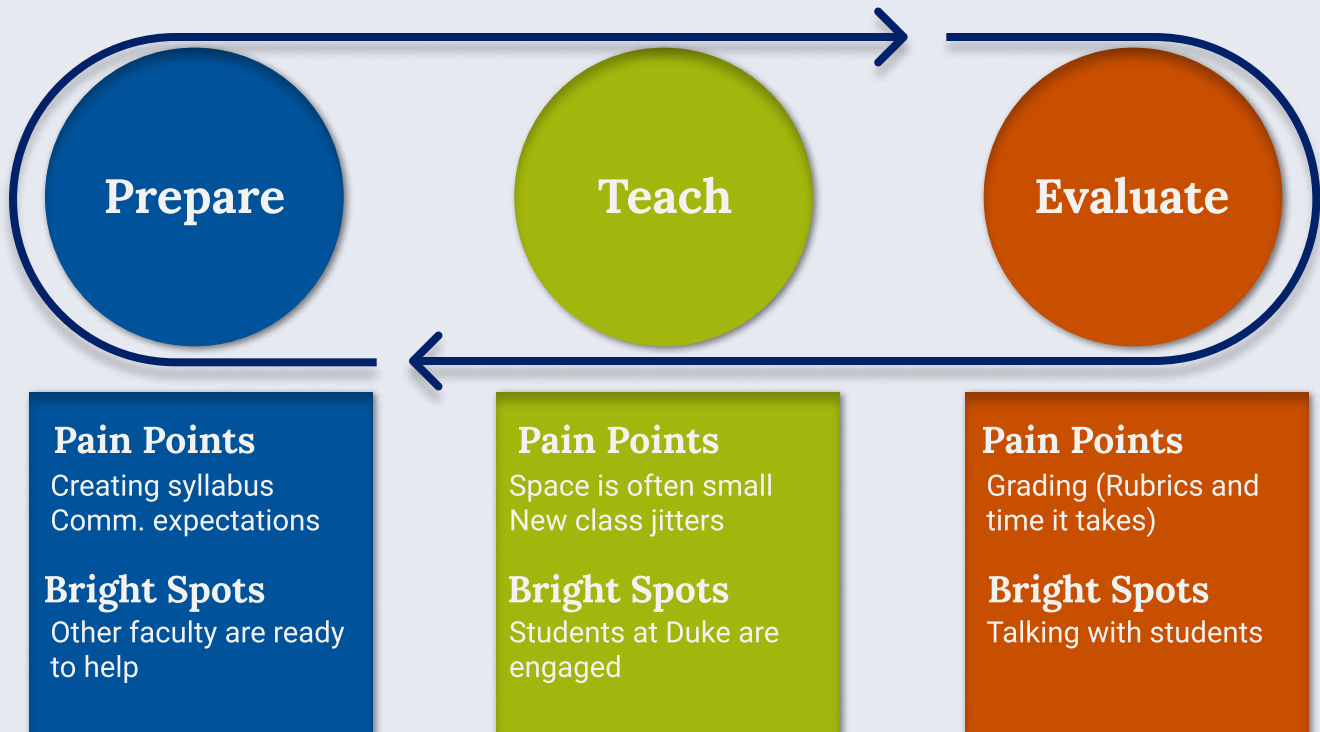
Needs Statement

Ruebe needs a way to rigorously grade student work that is reflective of the quality of the assignment and has a consistent rubric. Ruebe also needs the time to do this. She feels that grading is not a great experience and feels "judgy." She likes interacting with students, but also needs to get tenure and grading can distract from her research and preparing for class.

""

Grading sucks. No one enjoys grading. If there's a faculty member who enjoys grading, pfft! [If I were to enjoy it that's like a] power trip, right. So, you know, I'm always nervous about somebody that enjoys grading a lot.

Potenial How Might We Statement

HMW make grading an experience faculty find consistent, effective, communicative of expectations, and less time consuming?

Prepare

Teach

Evaluate

Pain Points
Creating syllabus
Comm. expectations

Bright Spots
Other faculty are ready to help

Pain Points
Space is often small
New class jitters

Bright Spots
Students at Duke are engaged

Pain Points
Grading (Rubrics and time it takes)

Bright Spots
Talking with students

Goals: Engage and teach students; stay at top of their field; TENURE!

Motivations: Advancing knowledge on topics they love

Interests: Reading; writing; conversations with students; sports

2

Customer Journey Map

This journey map outlines the cycle of faculty members at Duke in and around the classroom, identifying **pain points, bright spots, problems and needs** along the way.

Prepare

Bright Spots
- Having an open-ended, flexible classroom space;
- Faculty-to-faculty support;
- Having a starting point to work from.

Pain Points
- Creating syllabus from scratch;
- Learning to use the resources available;
- When you "over prepare" and don't allow yourself flexibility.

Needs: A way to balance being prepared with flexibility.

"You almost over prepare for the class that the material isn't as lived in, and under prepare for the class [you have more knowledge in]."

Teach

Bright Spots
- Student engagement;
- Teaching a class I am passionate about;
- Conversation based class structure;
- Building comminity in the classroom.

Pain Points
- Hard to teach new class;
- Teaching material outside my expertise;
- Classroom size;
- Lack of admin support.

Needs: Support from admin and understanding class dynamics.

"I do feel a little bit like "Whoa!", I want to help, but it's almost like the fire hose. I think [when the school comes to terms with its] identity issues that will enrich everybody's experiences."

Assessment

Needs: Purposeful/ Guided means of assessment.

"[Pop quizzes are] a bit of an arms race to make sure students are treating your class as important as other courses. It'd be great to find ways to [assess whether students are engaged] that don't require a kind of crisis to precipitate it."

Bright Spots
- Enthusiasm of students to connect outside of class;
- Conversational class settings make assessment easier;
- Sense of community.

Pain Points
- Motivating students about course content;
- Assessing ways to incentivize doing readings;
- Assessing what students are most interested in.

Why this moment matter...

Duke faculty members desire a better way to assess students. While evaluation is done after class, assessment is happening throughout the entire journey. **Faculty do not simply desire a better way to grade, but a better way to assess student outcomes which is why this moment matters.** Redesigning assessment will, hopefully, save faculty time and help them clearly communicate expectations to students.
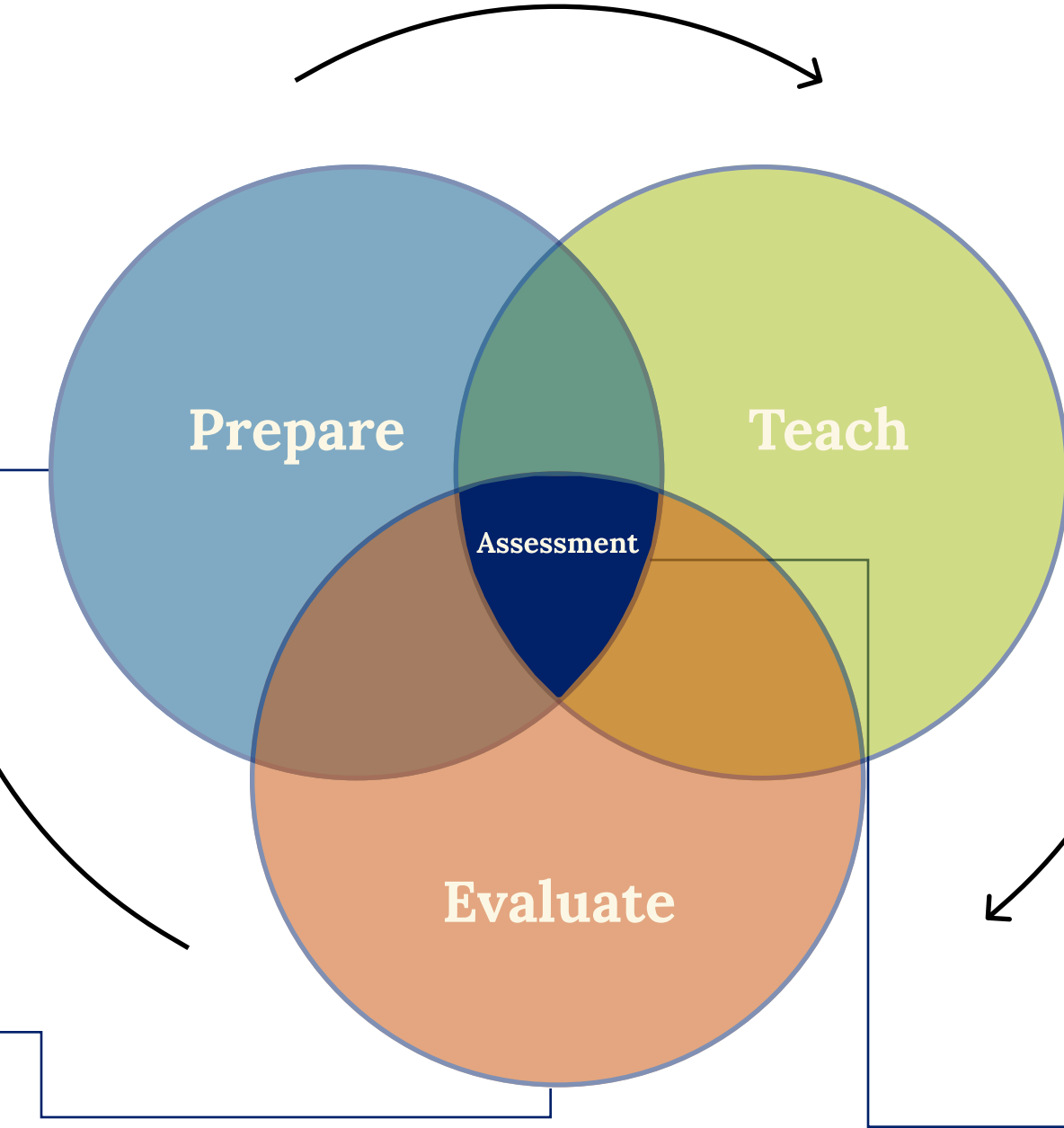
Evaluate

Bright Spots
- Seeing a broad range of interests through student work;
- Quality of Duke student work;
- Conversations with students about their work.

Pain Points
- Grading;
- Creating rubrics that make sense;
- Communicating expectations to students;
- Time constraints.

Needs: New grading criteria.

"The challenge is to be internally consistent and fair. That's easier when it's just you grading. It's harder if you have a 50 person class, and a couple of TAs. As you're going through essays, it becomes a challenge to figure out how to be fair."

A note on the difference between Evaluate and Assessment: Duke Faculty noted that there were key differences between sitting down with a student deliverable and evaluating it versus the assessment that happens in preparation for class, while teaching and while grading. The key difference here is that faculty perceive evaluation in terms of what students turn in and assessment as the personal developments they see throughout the course of a class and/or with particular students.

3

Empathy Journey Map

This journey map outlines the cycle of our team identifying, interviewing and ideating for faculty members to **improve their experience in and around the classroom.**

1. A Fresh Start
At the beginning of the semester our team was all new people (we miss Priya). So, we had to figure out what to do.
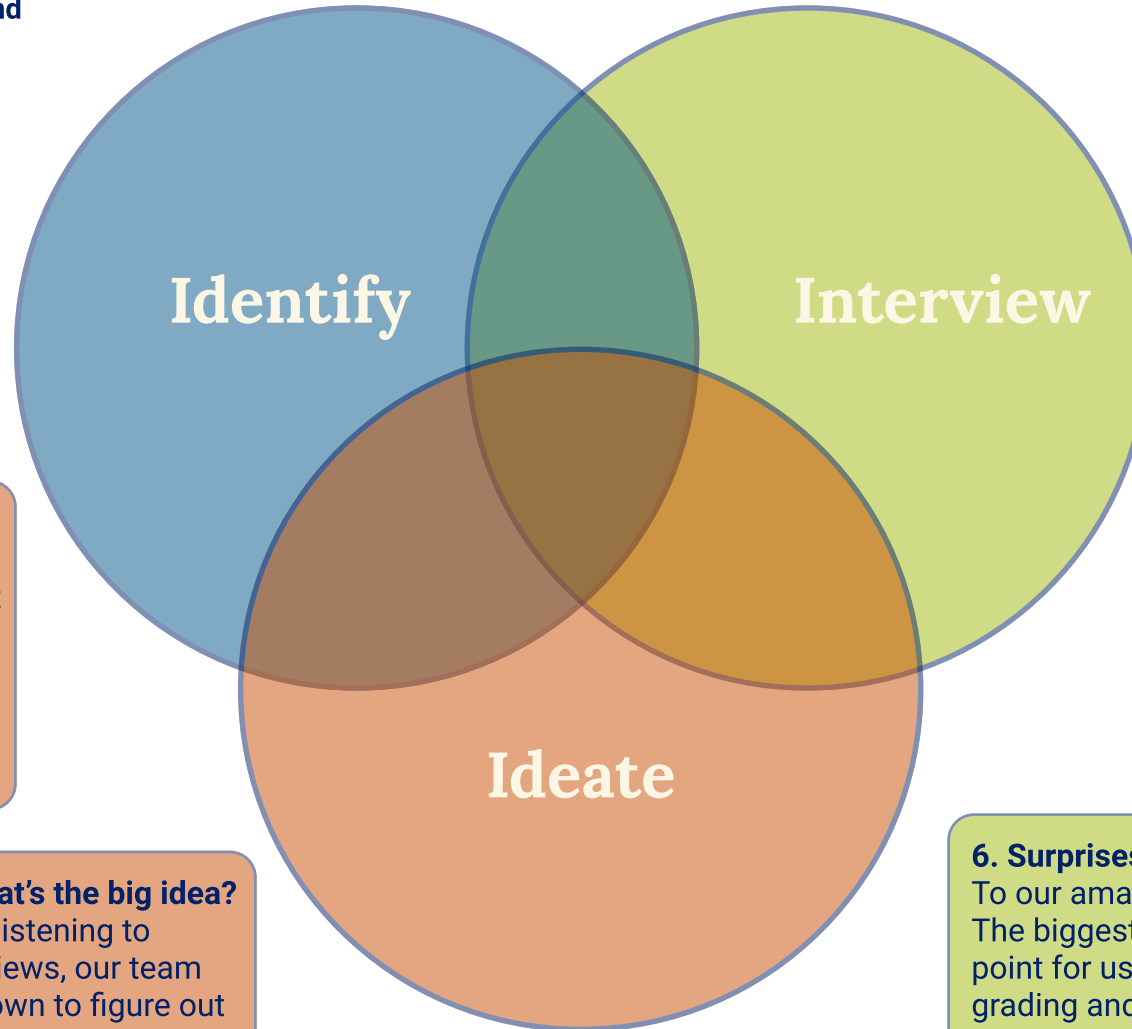
2. Failing Fast
Users gave our original concepts a thumbs down! So, we decided to go back and try to better understand our users' needs.

3. Reset
We noticed that users (faculty) were not central to what we were doing, so we took a step back to think...

4. Finding Faculty
We started by **framing our scope** (the classroom experience) and asking faculty to participate...

9. Next Steps
Our team will solidify our concepts and beging to co-design with users to come up with **opportunity based assignments.**

8. The Big Idea!
Faculty want more purposeful assessment techniques, so we started to think of ways to do that and came up with concepts.

5. Conversations
Once we reached out to faculty, they were happy to chat with us and we were able to talk to 6 faculty members.

Identify

Interview

Ideate

7. What's the big idea?
After listening to interviews, our team sat down to figure out what to do and found that faculty needed grounding in grading...

6. Surprises
To our amazement, The biggest pain point for users was grading and assessment!

Understand

Understanding **Stakeholders** is key to knowing what will create a better customer experience. The infographic below offers some insights to stakeholders we interacted with throughout the project.

KEY TAKEAWAYS

Classroom **communities** add to the **experience**
(physically open-ended, flexible classroom space, conversations with and between students, student engagement)

Faculty needs **support** too
(faculty-faculty, faculty-admin relationships)

Passion about the course is essential.

PAIN POINTS

Faculty need **support** too
(faculty-admin relationships, faculty-faculty support)

Expectations conveyed to students

Generating **enthusiasm** from students

Difficulty in teaching content **outside area of expertise**

Assessing student assignments and understanding of material

"[Pop quizzes are] a bit of an **arms race** to make sure students are treating your class as important as other courses. It'd be great to find ways to [assess whether students are engaged] that don't require a kind of **crisis** to precipitate it."

"I do feel a little bit like "Whoa!", I want to help, but it's almost like the **fire hose**. I think [when the school comes to term with its] **identity issues** that will enrich everybody's experiences."

"The challenge is to be internally **consistent** and **fair**. That's easier when it's just you grading. It's harder if you have a 50 person class, and a couple of TAs. As you're going through essays, it becomes a **challenge** to figure out how to be fair."

SOCIAL SCIENCE RESEARCH INSTITUTE

TRINITY COLLEGE OF ARTS & SCIENCES

DeWitt Wallace Center for Media & Democracy

Duke SANFORD HART LEADERSHIP PROGRAM

SANFORD SCHOOL OF PUBLIC POLICY

ASHOKA EXCHANGE

17 interviews

Center for Documentary Studies AT DUKE UNIVERSITY

EOS Division of Earth & Ocean Sciences DUKE UNIVERSITY

BASS CONNECTIONS

DUKE FUQUA SCHOOL OF BUSINESS

Duke NICHOLAS INSTITUTE FOR ENVIRONMENTAL POLICY SOLUTIONS

Create

The following infographic depicts our team's journey going from understanding our users to creating solutions with them.
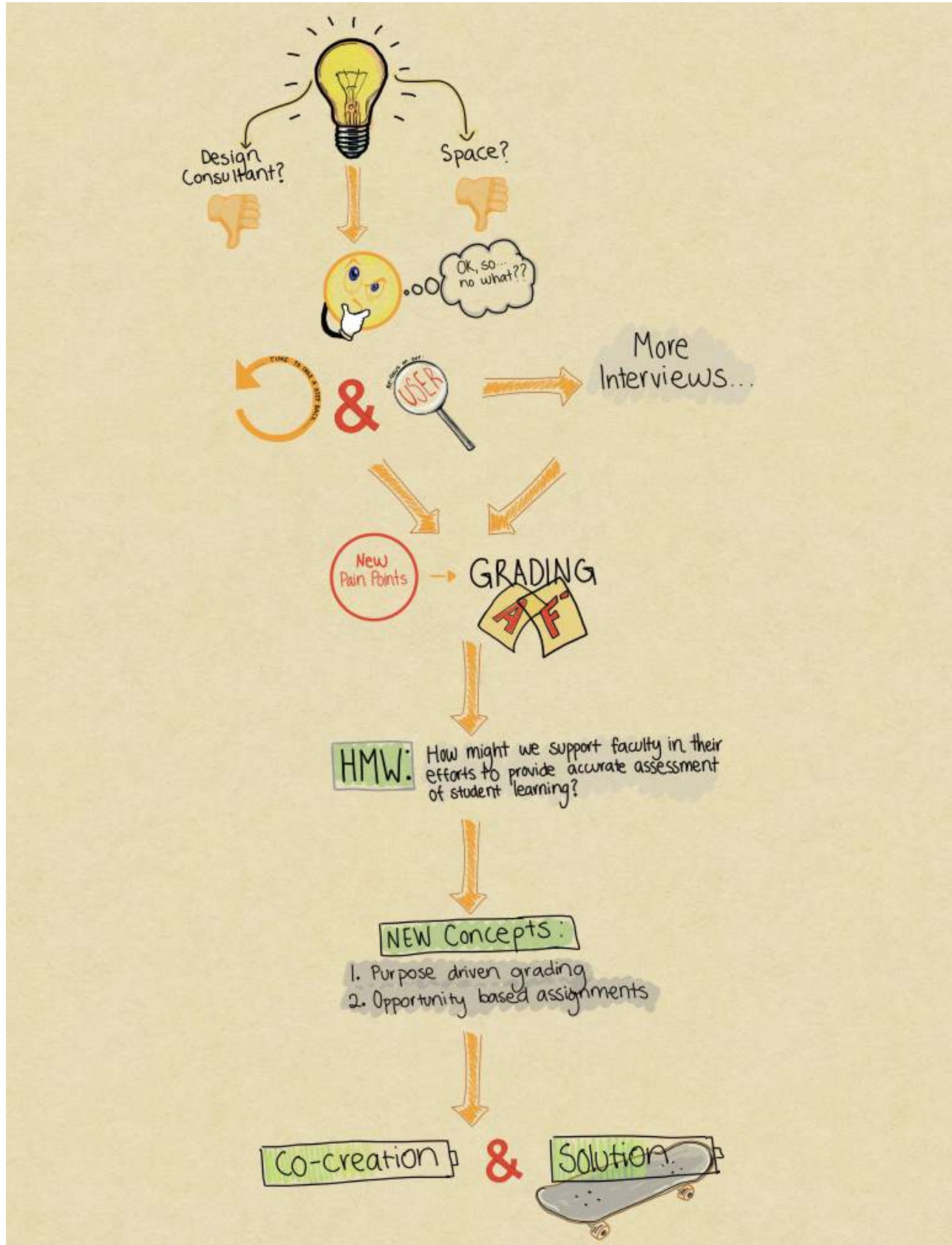
Evaluate

How Might We Statement...

Our team began to think of ways to help faculty answer their most pressing concerns and landed on the following:
HMW support faculty in their efforts to provide accurate assessment of student learning?

The Answer

The proposed solution is **opportunity based assignments.** These assignments will provide professors with real time/world assessment opportunities, and they will allow students to apply the concepts they have learned in class. This will allow for the activities to be purposeful and inherently cultivate authentic learning in the classroom. Opportunity based assignments are built to be flexible, adaptable, and purposeful, encouraging faculty and student engagement and interaction. They will support faculty in assessing the students in real time, thereby providing a more accurate assessment of their learning.

Opportunity Based Assignments: A Step by Step Guide

Step #1
Write 5 key goals/ learning themes of your class.

Step #2
Look at your syllabus and list, under each of the goals, the assignments/ tests/presentations that aim to achieve said goal.

Step #3
Write 1-3 real world applications for each assignment.

Step #4
Circle any of the feasible real-world applications that you could make happen (with resources and contacts) and would be realistic for students to submit their work to.

Step #5
Pick 1 of the circled assignments and update the assignment description. Redesign the assignment to incorporate the real world opportunity that you have decided upon.

Step #6
When you go through the syllabus on the first day of class introduce students to opportunity based assignments.

Step #7
When you grade your redesigned assessment, use the real-world guidelines to assess or use the opportunity as a barometer for assessment.

Co-Designing with Users

How We Got Here

In order to answer the HMW statement, our team conducted several co-design sessions with Duke faculty members. In our first round, we pitched some concepts to faculty members. Our primary concept was a guide to implementing a design sprint into their classes. Faculty found this would be more of an interruption than a benefit to the classroom experience. Therefore, for our second round, we decided to sit with faculty and co-design solutions with them.
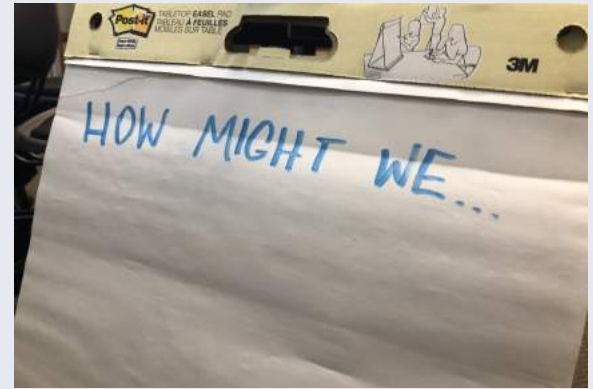
User Co-design

Our co-design sessions were conducted in three steps:

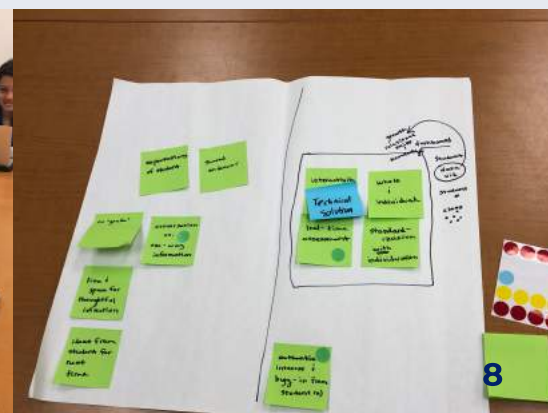| **Step 1**	**Step 2**	**Step 3**
Faculty walked us through the last assignment they graded.	We brainstormed ideas to make assessing the assignment more purposeful/meaningful.	Faculty divided ideas into "feasible" and "not feaisble" and ranked their top 3 ideas.

Co-Designing with Users

User Co-Design Findings

Our team then compared our high impact ideas based on feasibility with faculty ideas.

Faculty ranked the following ideas as their "top ideas" divided by "Big Ideas" and "Feasible Ideas":

Big Ideas

Make grading a conversation with students instead of a one way flow of information from faculty;

Don't publish GPA;

Grade to make students feel individualized;

Change length of semester;

Make assignments more student focused.

Feasible Ideas

Grade based on goals and purpose of the course, not just assignments;

Ways to assess students in real time and not only based on assignments;

Creating authentic buy-in from students via course content.

Outcome

Together, we combined ideas to come up with opportunity based assignments, which allow faculty to better understand the work their users (students) do in real time, as well as create more buy-in from students.
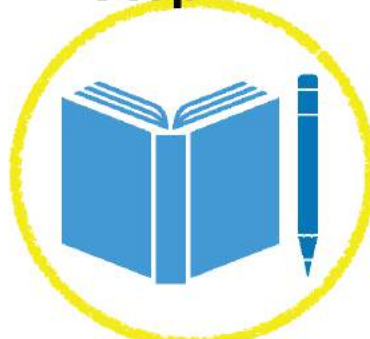
The Design Solution

Opportunity Based Assignments: A Step by Step Guide

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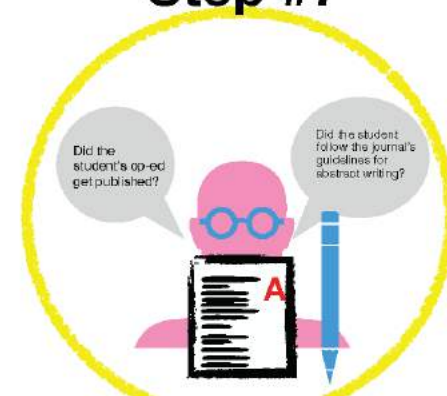
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Step #7
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The full step by step guide can be found at the end of this report.

The Design Solution

Op-ed's are not the only way. If students have to write a memo, have them write it for a client. Finding the client itself will also take part of the learning experience. If they have to make a documentary, have them enter it into festivals. **The opportunities and possibilities are limitless** and Duke has the resources and connections to make it happen.

What does this do for professors?

Professors had three main goals
1) A way to assess students in real time;
2) More faculty-to faculty support; and,
3) To engage with students' learning through purpose rather than just to check the right boxes.

The design solution is meant to be a two-way street, helping faculty and students. It helps faculty interact better with their users while addressing their goals.

After engaging with faculty by co-designing our solution, our how might we statement evolved from providing accurate assessments to providing real world assessments that cultivate authentic learning. In fact, one faculty member had a similar idea during our co-design sessions…

*"My number one goal is to get **authentic interest and buy-in from students!** It needs to be a conversation versus being one-way. [We need opportunities] for real time assessment."*
- Duke Faculty Member

The Design Solution

Cautions

Are faculty willing to make the change?

Will this be more or less time consuming?

Will opportunity timelines line up with semester timeline?

Grades still get in the way of more authentic assessment/feedback.

Assets

Duke has a myriad of opportunities available to their students that could be leveraged for assignments. For instance, before going to the New York Times to get published, students can submit a piece to the Duke Chronicle.

Duke's extensive alumni and faculty network makes creating the opportunities very accessible. All it takes is an email!
Students and faculty have expressed a desire for more collaboration. Most faculty themselves are involved in research, why not combine this research with assignments.

Bass Connections Resources

Bass Connections also has resources to help faculty make peer-to-peer feedback and grading easier. Click **HERE.**

*"It already exists, but there is a learning curve. **Duke already has courses with this type of grading."***
- Duke Faculty Member

The Design Solution

Skateboard to Car

Opportunity based assignments is a skateboard (short-term) solution, eliminating grades in general and using outcomes of assignments as well as faculty feedback would be the car (long-term) solution. However, we start with the skateboard because eliminating grades completely is not feasible at this time. Our solution allows assessments to be based in the real world in real time (i.e., students are having to engage with other stakeholders weekly to complete assignments).

Furthermore, our solution indirectly allows professors to engage in design thinking. They are using the Big Ideas and Prioritization Grid concepts that allow for better understanding of a user (in the case of faculty, their students.) In turn, assignments will fit the goals of the class and the students. It also provides a flexible framework that is centered around optimizing the purpose of a class (the reason something is done/the reason the class exists) over the function (what someone does in the class/the actions taken) in the classroom.

> *"[At the end of the day], the **number one thing is assessing the goals/purpose** of course [not a grade]."*
> *- Duke Faculty Member*
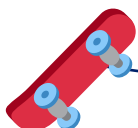
About Us

Maria

I am Maria, a junior at Duke University from the Dominican Republic. I am the biggest sweet tooth that has ever existed, who needs every meal to end with dessert. I am also the most indecisive person; it takes me hours to decide what movie to watch or where to eat. This did wonders for me as I came to Duke undecided, I would go from wanting to declare Computer Science to Global Health in a day, until ultimately I declared Psychology.

Matthew

Hi, I am a second year student at Duke's Master of Public Policy (MPP) program at the Sanford School. Born and raised in San Francisco, CA I never thought I would call the south home, but Duke and Durham have treated my family well. I am a big human-centered design nerd and am excited to see its implications in the public sector coming to fruition and being at the forefront of such efforts.
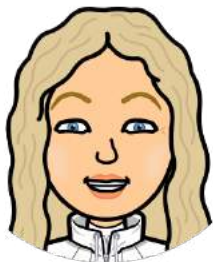
Paige

I am a first year master's student at Duke's Global Health Institute. Before coming to Duke, I went to the University of Toronto and am excited to continue learning more here in Durham.

Other Resources

Useful Faculty and courses at Duke to reference:

The Sanford School of Public Policy
"Using Human Centered Design to Improve the Citizen Experience"
Contact Professor Tom Allin for syllabus: tom.allin@duke.edu

Bass Connections
"Open Design at Duke and Beyond"
Contact Professor Aria Chernik or Kevin Hoch for syllabus:
aria.chernik@duke.edu and/or kevin.hoch@duke.edu

A list of other courses with faculty skilled in design thinking can be found **here.**

To learn more about the **Open Design at Duke and Beyond** Bass Connections Project, visit: https://sites.duke.edu/opendesign/

Opportunity Based Assignments:
A Step by Step Guide

How Might We Statement….

HMW support faculty in their efforts to provide accurate assessment of student learning?

What aspects of assessment are we trying to improve?
- Faculty engagement in grading
- Stress around arbitrary standards
- Practical use of assignments
- Making grading feel purposeful beyond assigning a letter grade

Make one assignment real-world

Short-term goal

Medium-term goal

Make 50% of assignments real-world

Make all assignments real-world!

Long-term goal

Applying opportunity based assignments for the first time:

Below is a step by step guide showing you how to take your assignments from being limited to the classroom experience and making them into opportunities for students in the real world. This will help you reach your goal of purposefully assessing and engaging with students. It is also a chance to allow students to take ownership of their work, as they will have to do in the professional world.

Opportunity Based Assignments: A Step by Step Guide

Step #1

Write 5 key goals/ learning themes of your class.

Step #2

Look at your syllabus and list, under each of the goals, the assignments/ tests/presentations that aim to achieve said goal.

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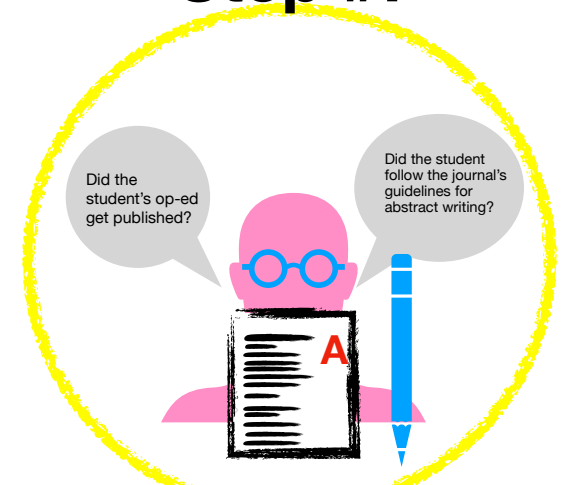
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Step #7

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How to Apply Opportunity Based Assignments: Class 101

Step #1

Write 5 key goals/learning themes of your class.

Example:

Key Goals of Class 101
1. Grasp concepts from reading assignments
2. Present information effectively
3. Increase writing skills
4. Develop team-based skills and ability to work with peers
5. Learn software skills

Step #2

Example:

Key Goals of Class 101:

1. **Grasp concepts from reading assignments**
   a. Pop quizzes
   b. Midterms (Multiple choice and short answer questions)
   c. Weekly blog posts
2. **Present information effectively**
   a. Presentations
   b. Portfolios
   c. Class discussion groups and participation grade
3. **Increase writing skills**
   a. Research report
   b. Memos
   c. Op-Eds
   d. Blog Posts
   e. Midterm
4. **Develop team-based skills and ability to work with peers**
   a. Presentations
   b. Group projects
5. **Learn software skills**
   a. Data collection
   b. Presentation graphics
   c. Using software for team projects such as Microsoft Teams, Google Docs, etc.

Step #3

Write 1-3 real world applications for each assignment.

Example:

Real-world applications for Class 101's assignments:

- **Pop quizzes**: working under pressure, preparation for technical interviews,

- **Midterms:** concise writing skills, application of learning from class to test questions, critical thinking skills and problem solving to put onto resumes

- **Blog posts:** publish blogs, posting blogs on LinkedIn

- **Oral Presentations:** pitching project plans or ideas to companies, conference presentations

- **Portfolio:** job applications, submitted to online platforms, create a website

- **Class Discussions:** networking (with peers, mentors, possible employers)

- **Research reports/ Memos/ Op Eds:** literature reviews for clients, publications in journals, newspapers, online platforms, magazines, Duke publication platforms

- **Data collection:** do this for an on-going project, add to CV

- **Presentation graphics:** do this for an on-going project, submit to journals, newspapers, magazines, blogs, Duke media platforms

- **Using software** for team projects such as Microsoft Teams, google docs, zoom etc: CV Builder

Step #4

Example:

Real-world applications for Class 101's assignments:

- **Pop quizzes**: working under pressure, preparation for technical interviews,

- **Midterms:** concise writing skills, application of learning from class to test questions, critical thinking skills and problem solving to put onto resumes

- **Blog posts:** publish blogs, posting blogs on LinkedIn

- **Oral Presentations:** pitching project plans or ideas to companies, conference presentations

- **Portfolio:** job applications, submitted to online platforms, create a website

- **Class Discussions:** networking (with peers, mentors, possible employers)

- **Research reports/ Memos/ Op Eds:** literature reviews for clients, publications in journals, newspapers, online platforms, magazines, Duke publication platforms

- **Data collection:** do this for an on-going project, add to CV

- **Presentation graphics:** do this for an on-going project, submit to journals, newspapers, magazines, blogs, Duke media platforms

- **Using software** for team projects such as Microsoft Teams, google docs, zoom etc: CV Builder

Step #5

Example: Class 101

We have selected: Research reports/ Memos/ Op Eds: literature reviews for clients, publications in journals, newspapers, online platforms, magazines, Duke publication platforms

Assignment title: Literature Review

Current instructions: Pick a topic of the course to conduct a literature review, this should be 12-15 pages, references, tables (1), figures (2-3) must be included, but do not count towards the 12-15 pages.

New assignment instructions based off of steps 1-4:

1. Identify a course topic of interest to write a literature review
2. Identify potential clients or people that would use this literature review in the 'real-world'. (Professor can help to identify potential clients)
3. Reach out to client and set-up a way to discuss the literature review that you will be conducting for them
4. Student submits literature review to the client and to the professor
5. The client will provide feedback to both the student and the professor as far as utility in their workplace setting. This feedback will help to guide the professor when grading the literature review.

Step #6

Welcome class! Today I will introduce opportunity based assignments.

When you go through the syllabus on the first day of class introduce students to opportunity based assignments.

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Step #7

Did the student's op-ed get published?

Did the student follow the journal's guidelines for abstract writing?

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When you grade your redesigned assessment, use the real-world guidelines to assess or use the opportunity as a barometer for assessment.

Now you will have officially introduced opportunity based assignments! We hope that this guide serves to demonstrate how to apply these assignments to your class. It is built to be flexible and adaptable to work for any classroom and topic, and can be modified depending on you and your needs.