OPEN DESIGN AT DUKE AND BEYOND

BASS CONNECTIONS 2019-20
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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

Tarunam Mahajan
Master of Engineering Management

Matthew Lanza
Master of Public Policy

Jeel Ghughu
Master of Engineering Management
Undergraduate Team Members

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Biology Major, Documentary Studies Certificate, Undergraduate, Class of 2020

Maria Lulo
B.S. Psychology & ISS Certificate, Trinity Class of 2021

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Daisy Wang
Economics and Cultural Anthropology, Undergraduate, Class of 2022
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 the 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 quantify 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.
Defining the Stakeholders

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**
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
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.
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

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?

SYNTHESIZING PROBLEMS + NEEDS

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

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

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
**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.
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 Extracurriculars
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?”
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:
Day 1: Students participate in design thinking through answering a general question
Day 2: Select a couple themes from the prior day’s answers for students to target and delve into pain points
Day 3: 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 infographic given below:
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 interest.
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.
PERSONA Librarian

“Students rarely go out of their way to make time to learn and interact with library resources.”

The library isn’t just used for reading, what is its new purpose?

Technology redefines the physical space

Greta

WHAT problems/issues do you have with collaborating with Duke students?

FEELINGS: useless/helpless
Greta feels upset because students don’t know/want to utilize the library for help

Frustration
The internet and how they can continue to play a role despite online resources

Greta wants to find a method of showing students the utility of the library while also creating a new role/place for herself that stays relevant despite new technologies.
CREATE
Ideate | Prototype
Stage 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](#)
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.
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.
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.
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
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, an **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
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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.
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.

**Potential How Might We Statement**

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

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**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
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.
  - Creating syllabus from scratch; Learning to use the resources available; When you “over prepare” and don’t allow yourself flexibility.
- **Pain Points**
  - “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.”
  - “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.”
- **Needs**
  - A way to balance being prepared with flexibility.

**Teach**
- **Bright Spots**
  - Student engagement; Teaching a class I am passionate about; Conversation based class structure; Building community 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.

**Evaluate**
- **Bright Spots**
  - Guided means of assessment.
- **Pain Points**
  - Motivating students about course content; Assessing ways to incentivize doing readings; Assessing what students are most interested in.
- **Needs**
  - Purposeful/ Guided means of assessment.

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.

"I do feel a little bit like "What?" 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."

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

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.

"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."

"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."
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...

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.

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

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...

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.

9. Next Steps
Our team will solidify our concepts and begin 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.
Understand 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."

17 interviews
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](image-url)
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**
Faculty walked us through the last assignment they graded.

**Step 2**
We brainstormed ideas to make assessing the assignment more purposeful/meaningful.

**Step 3**
Faculty divided ideas into “feasible” and “not feasible” 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

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.

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

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.

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.

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](https://sites.duke.edu/opendesign/).

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

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.
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
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.

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

Did the student's op-ed get published?
Did the student follow the journal's guidelines for abstract writing?

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

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

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

Example:
Real-world applications for Class 101’s assignments:

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

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.
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.

Step #6

Did the student’s op-ed get published?
Did the student follow the journal’s guidelines for abstract writing?

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

Step #7

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.