Discovering Student Career Paths RESEARCH INSIGHTS SPRING 2018



MHCI Team numo Carnegie Mellon University

Contents

03 Introduction

Executive Summary / 4 Preface / 5 About the Clients / 6 Project Goals and Justification / 7 Research Methods / 8

10 Current State of Career Planning

Students Have Narrow Job Knowledge / 11 Parents Are Distanced From Education / 12 Teachers Have Limited Career Awareness / 13 Guidance Counselors Are Over-Extended / 14 Pre-Existing Mental Models Inhibit Planning / 15

19 Student Career Planning Behavior

Student Archetypes / 20 Distribution of Archetypes / 26

27 Career Discovery Loop

Introduction / 28 Stage One: Identify / 29 Stage Two: Explore / 31 Stage Three: Evaluate / 33

35 Design Considerations

Proposed Core Functionality of Design / 36 Motivating Adoption and Engagement / 37 Exposing Job Market Data / 38 Student Privacy and Safety / 39

40 Appendix

About MHCI / 41 The Team / 42

Introduction

Executive Summary

This report covers research insights gained during the 2018 Spring Semester of numo and Allegheny Conference's partnership with a team of Carnegie Mellon Masters of Human-Computer Interaction students.

In the **Introduction**, we present the goals of the project – to improve high school career planning through design in order to meet future workforce demands. Additional back-ground information and our research overview, grounded in qualitative and design-oriented methods, are discussed.

The **Current State of Career Planning** presents a stormy view of high school student career thinking, including four aspects of the disjointed student planning environment and three blocking cultural mental models.

Student Career Planning Behaviors goes more in-depth on profiles of archetypal student behavior across five groupings. Pain points and design opportunities are given for each. An ideal career discovery process is outlined in the **Career Discovery Loop** section. This includes the three iterative stages of Identify, Explore, and Evaluate that we argue provides a solid framework to design for successful student exploration. Five nuanced opportunities across the stages are identified.

Design Considerations includes our guidelines for future design and intervention in this space. A model of an ideal system based on the Career Discovery Loop is presented. Additional considerations include advocacy for strongly motivating and embedded designs, for integration of market data into more holistic exploration designs, and with words towards privacy and student safety.

Preface

Over the past four months, our band of researchers and designers have thrown ourselves into the world of high school career planning. Dozens of interviews, a school visit, and too many post-it notes later, we have arrived at a wide array of insights – from design privacy considerations to systemic cultural mindsets.

Our Capstone project for the Masters of Human-Computer Interaction (MHCI) at Carnegie Mellon University (CMU) put together our interdisciplinary team to deeply investigate an issue and design solutions over seven months. The Allegheny Conference and numo tasked us to tackle future workforce issues in the Southwest Pennsylvania Region from the angle of high school career planning.

The following document is not an exhaustive list of everything we've done or where our team is moving forward towards design. Instead, we have gathered some of our key insights from Spring 2018 that didn't make it into our presentations or could potentially apply to future endeavors at The Allegheny Conference and numo. The road hasn't always been easy. Students are a difficult subject, and career planning is an issue mired in internal journeys, long-term processes, and implicit cultural patterns. We hope that our qualitative approach and design lens provides new viewpoints on this topic.

We have found this work incredibly rewarding. We hope that the stories we heard can be transformed into change through our research and future initiatives.

> ALEXIS, EMILY, JORDAN, NATHAN, & RADHA Masters of Human-Computer Interaction

> > May 2, 2018

About the Clients

numo.

A gathering of technologists, designers, academics, and business thinkers, numo is a technology incubator applying cutting technology and data science techniques to opportunities in the financial services industry. Numo fosters unique partnerships with technological academics for co-collaboration across many vertices within their portfolio.

Allegheny Conference on Community Development

The Allegheny Conference is a non-profit focusing on community development – bridging both public and private sector leaders in the 10-county Southwestern Pennsylvania region to improve the areas economic future and quality of life. The conference works across research and analysis, advocacy, and marketing to move the Pittsburgh region forward.

Project Goals & Justification

Allegheny Conference aims to secure the economic future of the 10-county Pittsburgh region through multiple initiatives. In this particular effort, the Conference has partnered with numo and now CMU MHCI, to target pre-college students, bridging their skill development and planning with the future workforce.

Students are a promising target because they make economy-impacting decisions at a young age – often using limited, semi-random career information from adults to set their career direction. In interviews with working adults, we found that many people need years and years of exploration to land upon the "aha" moment of finding a great career fit. The longer this goes on, the riskier and harder it is to explore or switch career directions.

By helping students explore and plan for career goals and skills the region needs, they will hopefully join the workforce in "better fits" for themselves and the regional economy, lessening the toll of sub-optimal employment and regretted education spending.

Our work addresses this issue through original humancentered research and design with the end goal of creating a product and/or service that aids student career planning. Spring semester involved research and early concepting, while in the Summer we will deliver a specced design.



Research Methods





Multi-Stakeholder Interviews We began with hour-long interviews of several stakeholders including students, parents, guidance counselors, outreach groups, and domain experts. We wanted to get a holistic view of high school career planning from many perspectives and see how well existing solutions were working.

Literature Review Our secondary research looked into academic journals, articles, and statistics. We referenced psychological career development theories, existing educational policies, and Pittsburgh region demographics. This provided foundational knowledge for our problem space and greater familiarity with the

Sample: 4 counselors, 3 outreach groups, 3 parents, 2 students, 3 domain experts



Student Interviews To get a better understanding of the diverse student career paths for students, we focused on interviews with early high schoolers. This helped us understand the different ways students discover their interests and think about their future. We used an affinity diagram to cluster interview notes and find common themes and sentiments.

Sample: 12 students

Southwestern Pennsylvania region.



Employee Interviews We concentrated on interviews with employees who are currently a part of Pittsburgh's workforce. This gave us insights on how professionals look back on their career path since high school and how they made decisions along the way. *Sample: 9 employees*



Co-Design Workshops We conducted a workshop with 9th graders at Elizabeth Forward Upper High School using interactive, hands-on activities such as fill-in worksheets and paper crafts. This was a valuable opportunity to use participatory design in a group to better understand their thinking and perspective. *Sample: 53 students*



Speed Dating We used speed dating as a testing method to validate user needs from our concept ideas. In these sessions, we showed students and parents conceptual ideas in the form of storyboards and followed up with probing questions. Our aim was to see whether users related to the problem solved in the storyboard, and not necessarily if they would use the concept itself. *Sample: 5 parents, 9 students*

Current State of Career Planning

Students Have Narrow Job Knowledge

Most students aren't equipped with the resources and tools needed to prepare for future careers. The limited, semi-random information students rely on often come from parents who are in specific career fields, and teachers and guidance counselors who's insufficient resources and time cause a struggle to connect students to clear and personalizable information to make informed decisions. With such limited job knowledge, most students set themselves up for future career risks, financing costly – sometimes unnecessary – education and training only to find a job not well suited for their actual skills and goals. These lead to risks in overeducation, low-income, and eventual drop-out as young professionals struggle to make data-informed decisions on future career paths.



Parents Are Distanced From Education

"Sadly, parents are the #1 most difficult audience to reach... Where do you even get the opportunity for parents to see the information they need to? A lot won't even come to Back to School nights."

Head of Education Intermediary Group

Although both primary and secondary research indicated that parents are the most significant influencer in a students education and career decisions, parents have limited career knowledge and access to career-related resources. They oftentimes only know information about their own careers or the careers of those in their networks. Their resources are limited by this network as well.

Therefore, teachers oftentimes rely on educators and counselors to provide career exploration and guidance for their student. Yet parents are often distanced from the education system and the stakeholders there, making it difficult for a joint effort to take place.

Teachers Have Limited Career Awareness

Although teachers are the primary influence on students in the school classroom setting due to their daily interactions with them and increased influence over the course of time, teachers are overworked and busy with the burden of creating lesson plans and abiding by mandatory curriculum and state-wide policies. This prevents them from giving each student personalized attention.

Teachers also communicated having low confidence in their own knowledge of career paths, perhaps due to having limited knowledge of these paths themselves. Only 50% of teachers reported confidence in career-related conversations with students, and 47% felt they weren't aware of local in-demand jobs (Student Readiness Survey, p. 38). "Many [non-vocational] teachers do not feel confident in their own knowledge and ability to help students with career awareness and preparedness."

Student Readiness for Future High-Demand Jobs Survey

Guidance Counselors Are Over-Extended

"A large part of my day is dedicated to socialemotional incidents; these cases often take priority over any proactive activities."

High School Counselor

Guidance counselors are oftentimes viewed by students and parents as having "all the knowledge" in terms of career and future paths. Therefore, they are mentally leaned upon by students and parents alike to provide this information and exploration.

Despite this, primary and secondary research both indicated that guidance counselors actually have the lowest impact on career-related decisions and least impact on future thinking for high school students.

In addition, counselors are perhaps in the most difficult place to help students, as a single counselor oftentimes has a caseload of 250 students or more. Their responsibilities oftentimes include handling social and emotional problems as well as administrative paperwork and therefore have very little time for career-related activities.

Pre-Existing Mental Models Inhibit Planning

In our conversations with and observations of students and their influencers, we identified several mental models that exist in American culture that surround high school and career planning in general. These cultural patterns and mindsets shape how students and influencers frame and act on career thinking. These three mental models inhibit the process of starting career direction discovery in high school. Any design in this space must traverse these cultural currents, possibly through trying to change these patterns or working around them through embedded and structured design.

COLLEGE OVER CAREER MINDSET JOB TITLE HYPNOSIS CONFLICTING PERCEPTIONS OF CRITICAL FRAME

COLLEGE OVER CAREER MINDSET

Students and parents focus on college (especially 4-year) as the finish line for a successful high school experience. Careers are seen as the step after college, instead of in tandem with educational goals. College prep becomes a more concrete deadline to work towards than career thinking.

Problems

- Students spend energy planning for college instead of the deeper career goals behind college
- Students are pushed towards college without an understanding of payoff versus risk
- Deemphasizes possible good fits in the trades

Opportunities

- Place college planning within a larger context of life timeline and long-term career goals
- Illustrate risks and payoff of college choices
- Highlight possibilities of high demand trade or 2-year paths

"Parents think that if their kids get to a four year college, they are set for life - but that's not the case. I think it'd be beneficial to educate parents."

High School Guidance Counselor

JOB TITLE HYPNOSIS

Students and adult influencers focus on single job titles or simple fields as acceptable planning goals. Students are trained to recite job titles when asked about their plans. The whole system is "hypnotised" by job titles rather than what these titles entail. Meanwhile, job titles in the modern and future workforces rapidly shift.

Problems

- Allows students to be "off the hook" by naming titles without knowing why they are interested in pursuing those titles
- Prevents deeper exploration of career aspects such as lifestyles, skills, paths to get there, and actual work activities
- Discourages the exploration of diverse and modern fields beyond traditionally-named titles

Opportunities

- Move towards matching student interests and capabilities to skills and work styles rather than just job titles
- Expand students' knowledge of what the modern career landscape is like

"They teach you what each career studies but it'd be nice to know dayto-day what certain careers involve."

9th Grade Student

CONFLICTING PERCEPTIONS OF CRITICAL FRAME

"Critical frames" are the windows of time where students have to make key decisions, in our case thinking about careers before deciding on post-high school plans senior year. Many 9th-10th graders and their parents feel that early high school is too early to be making key decisions. At the same time, some of our 12th grade interviews reflected that senior year was too rushed and late. There's a paradox of early high school is too early, but late high school is sometimes too late.

Problems

- The disbelief that students have to decide so early prevents exploration
- Parents' perceptions of critical frames can strongly affect their kids



Opportunities

- Illustrate planning paths to show some decisions need to be made earlier than expected
- Frame career exploration in less deterministic ways
- Integrate exploration and planning in ways that enable sidestepping of skeptical parents

"My kid's still too young to think about their future."

Parent of 9th Grade Student

Student Career Planning Behavior

Student Archetypes

We created archetypes of students based on patterns from our interviews (20 9th to 12th graders) and co-design workshop activities (53 9th graders). These archetypes to better understand the variety of ways students approach the career exploration process. We considered two variables: how much thought the student has put into career planning and how focused their career goal is. We see these archetypes as the diversity of where students currently are in their career thinking, as a proxy for their personal motivation levels and predispositions that we can design around.



THE DREAMER

The Dreamer can name specific career goals, but currently lacks the experience to understand or the drive to explore those goals. These goals are sometimes unrealistic or have little connection to students' current interests. There are often few signs they are working towards those goals.



"I'm pretty open but am considering animation. I've always loved Disney films so it'd be cool to work there...after college locally I might move to LA or Florida for Disney."

9th Grade Student

Pain Points

- Push off planning and exploration since they "have a plan"
- Create unrealistic hazy post-high school plans
- Risk investing in careers that are not a good fit due to lack of details



4

- Motivate students to explore earlier in case their dreams aren't a good fit
- Hands-on exploration
- Planning grounds realistic paths or concrete ways to reach dreams

THE UNDECIDED

The Undecided is a student that has started to vaguely consider careers but doesn't know what direction to go towards. They are mainly focused on their high school classes and social life. They are feeling some pressure and motivation to begin career planning yet don't feel they have to make any decisions yet.



"I knew that I wanted to go to college, but I would stress over not knowing what I want to do for my career."

12th Grade Student

Pain Points

- Feeling unsure about future
- Not wanting to think about it yet

ւ;

(4)

Opportunities

Create soft deadlines for more external pressure

THE APATHETIC

The Apathetic is a student that has not thought much about career planning and disengages in discussions when the topic is brought up. They occasionally have a specific answer when asked about potential interests but do not elaborate much further. They may lack motivation to deeply explore their interests, prefer to focus on other things, or may be dealing with other more pressing issues.



This archetype is the least understood in our research due to low sample size and a general lack of engagement with our research. However we did run into students with extremely strong career aversion and authority disengagement that merits mentioning this type of archetypal consideration.

4

Pain Points

- Unresponsive to external pressures from influencers and sense of authority
- Pushing-off thinking about career planning and future goals



- Provide easy ways to get started
- Engage through motivational and embedded design, avoiding any sense of forced authority

THE EXPLORER

The Explorer is a student that has put some effort into career exploration, but is drawn to multiple interests for their career field. These interests may be very different, so it is up to the Explorer to choose one career direction over the other or find a hybrid of their interest fields and criteria. They tend to be more motivated to explore their career fields, but may be stuck in ways to move forwards narrowing their planning process.



"I got interested in computer science because of Girls of Steel, where I got started coding, and then I went to an advocacy conference this summer with the team and became interested in public policy."

9th Grade Student

4

Pain Points

- Having to decide between multiple interests
- Uneven opportunities to explore their dispareate interests



- Exposure to lesser-known hybrid careers and titles
- Exposure to a wide variety of career options
- Hands-on exploration

THE GO GETTER

The Go-Getter is a student that has a specific career goal and is actively working towards their interests through their day-to-day activities. They have strong internal motivation and take advantage of the resources around them. Go-Getters often had a specific interest spark in their past or active role models to drive them towards their future career goal.



"I know I want to be an anesthesiologist. I've already asked a someone I know who's in medical school what it's like and I already bought textbooks for my college classes."

9th Grade Student



Pain Points

 Knowing what specific steps to take towards goal

- Reflect on current experiences
- Provide assistance with planning

Distribution of Archetypes



ARCHETYPES

The Career Discovery Loop

Introducing the Career Discovery Loop

The Career Discovery Loop is a model that visualizes the three stages that an individual should experience in order to find confidence in a chosen career path. This model came out of successful stories of working adult's journeys. It provides an ideal framework of what high schoolers might go through in discovering career directions to work towards in their post-high school plans. The goal at the end is to be better equipped to plan for college or a post-grad job with a full career in sight, at increased fidelity (whether that's a field or a specific title). The three stages may be looped through one or, ideally, many times as people course-correct and try out new directions to explore. Each loop is not relegated to a particular time frame or depth. For example, you could loop in a single Google session or during a four year stint as a therapy assistant. We found that more loops or deeper loops lead to a level of understanding that better sets a course for your next career decision.



2 EXPLORE

STAGE ONE: IDENTIFY

EXPLANATION

The first stage, Identify, involves articulating your own potential interests and then matching those to potential careers or avenues to explore. This is the stage that requires reflection about who you are as a person, your goals, and your constraints. This goes hand in hand with comparing these self-reflections to potential exploration areas. At the end, you make decisions on which avenues to explore.







Elevate Interests



Discover Career Matches

OPPORTUNITIES

Help Articulate Interests & Potential Fields

Some students struggled to internally reflect on their interests. What are their strengths? What is relevant to career thinking? What "counts"? Others said they rely on others to provide perspective on their own strengths and interests. They looked to parents, teachers, and mentors for suggestions because "sometimes other people know you better than yourself." These stories show opportunities for more guided and structured ways to help students capture their subject-matter interests and ideal career aspects like skills and lifestyles.

The general failure of career quizzes and personality tests were that these articulating moments are often too deterministic and limiting, they only happen "once," and that they don't always match results to explorable career directions to try.

Helping students articulate their interests requires flexibility, a wide range of variables for matching, and multiple avenues to move forwards in exploration.

Expose to Diverse, Available Careers

Knowledge of a wide variety of job titles, fields, and domains in the modern work landscape is a major challenge for this early Identify stage. Even if students know themselves well enough to articulate interests, they can't match to career directions they aren't aware of.

Guidance counselors lamented the general ignorance of possible career paths on all sides, especially outside "traditional" fields like law and healthcare. Allegheny Conference survey data shows that less than 10% of teachers felt students were very or extremely aware of available jobs.

In order to plan their next steps, students' really need a wider scope of job possibilities, both general fields and specific roles. This could be through an interest-matching process or more open exploration.

STAGE TWO: EXPLORE

The middle part of the loop is the core experiencing or learning process to understand a chosen career vector. The goal for this stage is to understand the career direction as much as possible depending on the fidelity of discovery. Quick explorations can be useful for multiple iterations. But the deeper the understanding, the more likely a person is to truly realize whether a career is a good fit for them.

2 EXPLORE





Information & Data



Find Opportunities



OPPORTUNITIES

The Power of Hands-On and First-Hand Experiences

A huge opportunity for this stage is providing students with hands-on and first-hand experiences. Hands-on refers to job-related experience that directly involves real career activities, such as internships and shadowing. First-hand is when the source of experience comes from actual industry professionals who can answer students' individual questions.

Allegheny Conference Career Readiness Survey data indicated that students highly value hands-on learning styles, internships, and job shadowing, but there is a huge drop off between awareness and participation in these styles of career engagement, especially internships (p. 44-46).

Interview data corroborated this, with students repeatedly voicing the desire to experience the actual job beyond written description, and talking to professionals to quickly tailor their individual questions.

Expand Student Network Beyond Parents

How can students' interact with and experience professional settings? Parental networks have a huge influence on students' knowledge of jobs, but parental connections are also a major source of industry connections for students. Low resource and rural students have fewer opportunities for these kind of experiences.

When asked how they might get involved with hands-on experience, students mentioned they would use Google to find answers and that guidance counselors have industry connections, neither of which is efficient.

One opportunity is to connect students to real industry settings and professionals, through a real-life matching system. Another approach to this issue is providing comparable digital experiences to in-person activities, such as video calls or virtual job shadowing.

STAGE THREE: EVALUATE

The final part of the loop is to Evaluate the experience and learning in order either plan or move into your next exploration iteration. This involves articulating what you liked or would like to avoid in future career directions. The last part of evaluation is setting a course, either transitioning to planning or strategizing your next move through further discovery.





Redirect Course



Prepare to Plan



OPPORTUNITIES

Reflect on Skills, Work Styles, and Paths

In our interviews, we found that many successful stories involved nuanced reflection of core skills and aspects of jobs. As seen earlier in "Job Title Hypnosis", there is an opportunity to aid reflection on experiences deeper than "yes" or "no," and instead towards broadly comparable skills and work styles.

Although career thinking beyond job titles is important throughout the entire the process, it's particularly suited for the Evaluate stage.

Helping students reflect on a deeper level on aspects of experiences can lead to a more effective redirection in subsequent loops. This can include skills, work and lifestyles, education required, day-to-day activities, and social settings.

Design Considerations

Proposed Core Functionality of Design

Based on the opportunities mentioned previously, a successful design solution would include a system that assists students with completing the established Career Discovery Loop. This core functionality demonstrates a manifestation of a possible system that could accomplish this.

In the identify stage, students should be able to input various factors into a system - these factors can include personality traits, favorite classes, activities they enjoy, etc. Using these factors, the system should be able to suggest career options and provide activities for the student to explore.Using these suggestions, the student can then proceed to experience the activity either inside the system or externally.Once they are finished with the experience, the student can evaluate the activity, what they liked or didn't like, and determine whether or not they want to proceed with that field. If they do not wish to, they can go back to receive more career suggestions. This process continues until a student is confident in pursuing a specific path based on their evaluation of their experiences.



Motivating Adoption and Engagement

After testing concepts with students and parents, we received lukewarm reactions and hesitance to begin using a system like this out of interest in pure exploration. We realized we needed to motivate early high school students to engage with the system across three pivotal points, otherwise the system risks failure of adoption and lessened impact.

First of all, without a strong motivation or influence pushing a student to use the system in the first place, the system may remain unused. There must be strategies to grab students' interest even if they are skeptical of career planning. Next, once students proceed to identify their interests and receive associated recommendations, there must be a drive or motivation for them to Follow Through with the system and explore those recommendations.

Finally, due to the importance of repeating this cycle of exploration and evaluation to refine one's chosen career paths, there must be a driving factor pushing students to Continue Engaging with the system instead of stopping after one cycle has been completed.



Exposing Job Market Data

A major interest of The Allegheny Conference and numo at the start of this project was the potential to expose market data on southwest PA jobs from sources like the Burning Glass Report. By providing short- or long-term market information, along with other info like planning and education cost, the hope is for students and parents to make decisions that are mutually beneficial for young workers and the health of the regional economy.

Based on our holistic understanding of the space as well as directly concept testing elements of this, we have a few recommendations. We will continue to explore this space over the summer, as our sample and design integration of this feature iterates.

In concept testing, parents reacted most positively to the idea of direct career outlook and planning data (possibly with the experience to know these variables are important). However, student reception was lukewarm — many didn't see a personal benefit. This could potentially be confounded by students' lack of experience with markets and money, as future finances are an abstract concept. However, we did see many, especially rural, students who knew financial security was a major concern.

We advocate that the exposure of job market data should be part of a larger motivating system about holistic career exploration motivated by student interests and planning. Job market and other data is also not standalone sufficient for the "Explore" phase of discovery as it doesn't itself provide the depth of knowledge to evaluate good career fit.

We currently see this as a possibility during the bridge between Identify and Explore phases of a future system, where students can micro-evaluate these variables (if a motivating factors).

Student Privacy & Safety

Student Data Visibility and Privacy

A key design decision is how student data is used and who in the system is able to access it. Can parents, friends, or professionals view student input? What do parents and students want?

In our early concepting we probed on some of these issues. We found that most students were open to sharing their data with parents, but wanted final "control." Many parents liked the idea of seeing and using student data to engage conversation. A few parents wanted to instead be removed from a system like this to prevent influencing their student. Students and parents feared that shared resources or competitive comparisons between students could lead to hurt feelings and toxicity for a very personal topic.

Networking Safety Perceptions

Another key issue is student privacy and safety relating to contact with professionals outside of parental networks for those potential designs.

Parents expressed that they were comfortable with the process, but would definitely need to be closely involved once things got close to face-to-face contact. Some parents wanted to be included through the full process, but we observed the risk of parents having too much control over the exploration process.

Other recommendations are for vetting processes and group interactions rather than one-on-one opportunities.

Appendix

The Team







Emily Deng A technologist with a knack for coding, gadgets, and design. She has a special place in her heart for typography. She's from the SF Bay Area where she traveled as an IT consultant for a data management software company. When she's not in the MHCI lab, she's cooking up yummy Instant Pot recipes and singing badly at karaoke.





Jordan Jackson Formerly a product manager and a sucker for great aesthetics & experiences, design inclusivity, and strategy. He settled in the SF Bay Area for a brief period after finishing his undergrad in 2016 and before joining MHCI. In addition to being a tennis fanatic, he enjoys photography and distance running.

Nathan LeBlanc A researcher hoping to connect design with anthropology. He's from the Boston area with stints in Iowa and SF, and he was previously a UX Strategist at an agency with experience in global development and non-profits. In his free time, he plays Overwatch and enjoys drag shows.



Radha Nath A UX Strategist coming from agency-side with a background in project management and QA. Although she's a Florida-native who loves the water, part of her heart lives in the mountains of Colorado. She's a lover of many things, among those things: jigsaw puzzles, coffee shops, her precious pup, and all of the hiking things.

About MHCI

Carnegie Mellon University's Masters of

Human-Computer Interaction is a three-semester professional degree preparing students for careers in interaction design, design research, and adjacent fields such as product management and prototyping.

The program follows a human-centered approach to design: exploratory research to define needs, research through design, design to meet holistic needs, and evaluation of effectiveness.

The design approach to research is more exploratory and flexible than many other research disciplines. This includes a foundation in exploratory qualitative research where the unexpected emerges. Research questions shift as project and design directions ebb and flow. Methodology is more fluid than it is in many other disciplines, including the use of design artifacts to understand human behaviors. The culmination of the MHCI program is Capstone, where interdisciplinary student groups of four to six tackle a problem for a client. In Spring semester, students conduct original research to define and investigate the issue at hand using a variety of methods. They begin narrowing their design scope and concepting solutions. In Summer, the team iterates on designs and builds-out functioning prototypes and working products.