INTRO

Human-centered design (HCD) is the process of re-imagining a product or service by bringing the needs of the people who use that product or service to the forefront. It is a design philosophy, whereby uncovering the user's needs, behaviors, characteristics, pain points, and motivations through ethnographic research leads to the design of better user experiences. The Human-Centered Design framework practiced in the Master of Arts in Design and Innovation (MADI) program at Southern Methodist University (SMU) teaches to solve problems through a seven-step process (often referred to as the Seven Circles). The first step in the Human-Centered Design framework is Define. In this stage, we set out to define the general and broad scope of what the project is focused on. This starts by generating a guiding design research question through a structure we utilize called the "How might we…" question. This first stage is designed to help define a starting point for the rest of the process by establishing the initial guiding research question. The second phase, Understand, is meant to continue defining terms within the How might we… question and build context for the overall project. We use qualitative research methods to understand the problem we're designing for and to accurately account for the audience we're designing with. Recognizing the importance of asking the right questions is no easy task. These questions are used when gathering secondary research from similar or analogous fields and in-depth interviews with primary sources to help establish the actors, factors, and issues within the project context. Actors are the groups of people or organizations that build up the ecosystem surrounding the topic considering both the direct and indirect. Factors are the actual and general facts around the topic, the things we know to be true. Issues are the pain-points, uncertainties, and complications that make this a problem well-suited for a

design solution. The third phase, Imagine, is for brainstorming about what could take shape to help the project that accounts for all previously gathered information and evidence. This is where we start to think about potential solutions that are rooted in evidence. The fourth phase, Refining, is a major pivot point in the process that takes all of the previously gathered research, ideas, hunches, and feelings together to narrow in on one to three specific directions for the project. The fifth phase, Make, is something that sets the Human-Centered Design process apart from other fields. It requires us to design, build, and make a prototype of what might help answer the original question. We might think we have the right idea that has been founded in evidence, but we won't know unless we live it and experience it ourselves. We work to answer questions through building, testing, and learning from every prototype. The sixth phase, Test, is what brings the whole prototype concept together. A team could build the best solution for a project, but they won't know if it's successful or if it does what it was intended to do unless it is tested. This is where we see what we missed and what we got right. By testing what we make we are able to learn and iterate on the prototype before we give a final deliverable. Our goal with this phase is not to prove that our design worked, but rather to see what we can learn from what we put into the world. The seventh phase, Tell, is actually not the last phase in the framework. This section is set apart from the previously overlapping circles to show that it is its own section but also helps launch the entire process over again. It also shows that telling is a part of the entire process and can be applied within each circle. Not only is tell infiltrated throughout the framework, it also has its own designation and is seen with how we create a final case study report of the entire project we've worked on. By including this section, we're providing a well-formulated description and explanation of our process to create an example of not only the work we do but how we did it and why we did it in the first place.

Cancer is a debilitating disease and therefore the focus of extensive research, but at what point does that research separate the disease from the person battling it? This is an especially poignant question with respect to pediatric cancer, as I experienced firsthand as a patient at Children's Health in my own childhood. While working to heal the children's bodies will always be the priority, why are we not continuing their schooling to the best of our abilities to strengthen their mental health and stability, reinforcing that there *is* a future for them once they've healed?

Using human-centered design influenced by my own experience, I have reimagined the disruptive process of hospitalization during such a formative time by focusing on continuity of education. Becoming our own person involves who we are as not only part of a family and a member of our community, but also as a student. It is a mistake to overlook the value of pediatric cancer patients' resilience that could improve society if we do not forget about education, critical thinking skills, and ingenuity during their care. Every day cancer patients fight something that most people call "unimaginable" so we should do our best to also reimagine what they can positively look forward to once they are healed.

DESIGN RESEARCH QUESTION

How might we improve education services for extended stay pediatric patients within public hospitals?

For the purposes of this project, I investigated the Education Service Department at Children's Health in Plano, Texas working directly with Education Service Representative, Brooke Soard. Being diagnosed with and surviving non-Hodgkin's lymphoma at the age of 12 has driven my interest in pediatric cancer philanthropy and the way leadership and design plays a role in large life disruptions like cancer. I set out to find a way to design a better environment for young, long-term stay patients but this goal is embedded in a very complex, layered system. This complexity of hospital administration more broadly is too nuanced to fully investigate, so, after reflecting on my own experience, I chose to focus on the lack of consistent education (within reason during treatment cycles) for my diagnosis.

CONTEXT

THEMES

Secondary Research suggests that long-term stay pediatric patients in the hospital can fall developmentally, mentally, and emotionally behind extremely rapidly. Evidence shows that children who stay in hospitals for an extended period of time, feel disconnected from their peers, have a higher rate of anxiety and depression, and struggle with reintegrating back into normal school life. Cognitive impairment affects up to one-third of childhood cancer survivors (Pat, McGrady, & Harman, 2013).

When considering a young patient's long-term hospitalization experience, it is vital to also consider what their lives would be like if they were not hospitalized at that time. To do this, I looked at five themes: 1) educational structures; 2) mental health; 3) developmental psychology;

4) parents; and 5) programs. These themes encompass every aspect of a child's needs and how their environment will or should have been affecting them during this time in their lives. During school, especially post-pandemic, we have found what importance there is in having a designated physical location to receive an education compared to what a school would also offer if the information gathering happened in other ways like virtual learning (Chingos & Whitehurst, 2021). Some additional resources about this topic include articles which review the importance of attending an actual school compared to virtual learning and the life stability and structure that attending an in-person school provides that should be replicated as best as possible for children with long-term stays (Rodríguez-Mena & González-Sanmamed, 2019), (Bettinger, Fox, Loeb, & Taylor, 2020), (Richardson & Swan, 2003).

Next, for mental health, we will look at what a child would be experiencing and learning at a school of their peers, and what they are missing out on by being separated from them. Through this secondary researched, I found that most discuss how important having an external focus can be for children whose everyday experience is focused only on them, how this separation may cause delays in understanding social cues and connecting with others or may make them feel as though they are an outsider because when they return their peers will have bonded without them. Then we will investigate the developmental psychology of a child's life. The research also illustrates in detail about the potential negative impacts on a child's sense of self; auditory processing and understanding delays; and the way that the children deal with anxiety, stress, and depression because these impacts can cause actual biological changes to their brain. (Tarazi, Grant, & Wells, 2015), (Filmer & Schady, 2018), (Baquero & Bursch, 2014), (Basch, 2011), (Souza & Gomez, 2019), (Hwang & Chung, 2015).

Proceeding from a discussion on developmental psychology is the theme of parents. While we recognize parents are doing their best and are also severely affected by what their child is going through, they can also add to some of the previous concerns as they relate to the child themselves. Research explains how parents can make decisions because they are easier for the parents to relieve some of the pressure they are facing but can be detrimental to or hold back the child's progress. Children's educational progress can include things like removing their child from school so that they do not have to constantly update paperwork or add to the anxiety of how much a child must make up in order not to fall behind, or something like decision paralysis because they are burnt out from having to make so many life changing choices every day. (American Academy of Pediatrics, 2016), (Chan, Chong, & Abdullah, 2017), (Gandhi & Barach, 2016), (Farrell & Holmes, 2016), (Gibson et al., 2013), (Mullins et al., 2000).

For the final theme we will explore programs. Hospitals are generally well-organized and have many services and programs available that are just not advertised or well-known. These types of services and programs would include education liaisons that are unbiased third parties that connect with educational services for these children to be able to stay mentally active and challenged, or other psychiatric services or programs such as counseling to help them not only work through what is happening to them but also what they may feel like they are missing from their "normal" life. Looking at case studies within Dallas such as Cook Children's Health Care System and other pediatric facilities in different health systems such as Texas Children's Hospital or Helen DeVos Children's Hospital. (Gentle & Shaw, 2015(, (American Academy of Pediatrics, 2004), (Baer & Forestell, 2019), (DeCamp & Fisher, 2015), (Wood & Jones, 2005).

Having a better understanding of the bigger picture and generalized concerns, the next section will include details for the client I designed this project around. To design for long-term stay pediatric cancer survivors at Children's Health Plano, I needed to understand the intricacies of the education ecosystem within the hospital where my designs would be implemented. To explore this ecosystem, I identified the actors, factors, and issues surrounding this layered facility.

Actors are the people and groups that live in and shape the environment such as who is running things, who are we designing for, and what does this people group need? To better understand and answer these questions, I needed to expand my knowledge at this specific location. That knowledge base, what we also call factors, are the unchanging pieces of information related to my research that will help to guide me to my goal. Of course, these ecosystems do not exist in a bubble. Every problem is shaped by systematic issues, and we must examine those issues to provide a complete, accurate, and holistic solution.

ACTORS

Children's Health Plano is part of what began as the University of Texas Southwestern Medical Center which has expanded into Children's Health. Children's Health Plano is a private, not-for-profit facility that was the second hospital to be added to the Children's Health system. It is an academic medical center campus located adjacent to the Children's Health Specialty Center Plano. The hospital currently has 72 beds and four operating rooms. It offers 24-7 emergency services, and laboratory, pharmacy, and imaging services.

There are three full-time Educational Specialists: Brooke Soard, Jane Trilca, and Deanna Morgan. All three of these women are General Education and Special Education certified in the state of Texas. Their role within the school service department is to consult with the patients and patients' families who have had an expected stay of 10+ days, patients with new medical diagnosis(es) which will necessitate accommodations or services in school, school contact for school issues or concerns, and parent concerns regarding current section 504 (accommodation) plans or Individual Education Plans (IEPs for Special Education students). Additionally, Jennifer Roady, who is the Manager of Family Support Services, manages five departments including Child Life, Language Access, Family Resource Library, School Services, and Volunteer Services.

Within the hospital, there is also the medical staff including doctors, nurses, and administration, who were found to often not realize that these services were even available although they have their own office within the hospital.

We will also focus on the patients and the patients' families. In 2021, the cumulative number of patients treated between both campuses totaled 270,663 children. Of those patients, the parents tend to be the patient's advocate and point person for school services as the children are minors and cannot make these decisions for themselves legally. Since our focus is on the child's education, we also include all the Dallas- and Plano-area schools that the patients come from. When a child needs a consultation, the school services work with whatever school that child was originally enrolled in to find a solution.

FACTORS

The School Services Department offers five different kinds of services:

Hospital School

Hospital school is for patients who have an anticipated hospital stay of 10 or more days. Children's Health works closely with the Dallas Independent School District (DISD) and Plano Independent School District (PISD) to offer classroom instruction for children from kindergarten-age through 12th grade. Instruction is provided by certified teachers employed by the school district.

- The patient is expected to have a hospital stay of 10 or more days (at the time the school referral is made). This includes children admitted for a one-time illness or injury and those whose illnesses require multiple hospitalizations.
- The patient must withdraw from their local school to be enrolled in the program. This process will be taken care of by the school services department at Children's Health.
- The parent(s) and/or legal guardian(s) are required to complete all school district registration paperwork for their child to be enrolled.

Classes are held Monday through Friday during the school year. Generally, one hour of daily instruction is provided in the four core subject areas (English, math, science, and social studies). However, the school schedule is determined by medical treatments. Bedside instruction is available for children who are unable to attend classroom sessions.

Hospital Tutoring

School Services partners with volunteer services to provide tutors to patients who need assistance with schoolwork during hospitalizations. All tutors go through the volunteer services screening which include a background check. Our tutors have a variety of experience from college students to retired teachers. Tutoring hours are Monday through Friday during the school calendar year, based on volunteer availability.

Psychiatry School Program

This program is to support the child's community with school for continued academic success and tools for behavior and mental health support in the classroom. The classrooms are staffed by teachers certified by the Texas Education Association from both Children's Health, the Dallas Independent School District (DISD) and/or the Plano Independent School District (PISD). The primary focus of the school program is to provide continuous school instruction and to decrease distraction from treatment, due to parental or patient anxiety regarding school achievement. Specialized behavioral programs focus on increasing self-management and implementation of coping strategies within our classrooms. Those recommendations are communicated to the patient's school. This program strives to stabilize the patient's behavior and teach the patient's community the skills they need after the child leaves the hospital. All patients entering our psychiatry program will be assessed for DISD or PISD school. If the assessment deems enrollment is necessary, it will be done at the time of admission. Classes are held Monday through Friday during the school year. Hospital teachers also provide instruction to non-DISD patients as they transition back and re-enroll in community school, which is determined by their different levels of treatment.

Psychiatry Partial-Hospitalization

Through the school re-entry program, a child-life specialist and sometimes a nurse from the appropriate clinical area visit the class of a child who has been absent from school for a long period of time due to illness, but who will now be returning to the classroom. School re-entry also provides a chance for the hospital professional to explain misconceptions, ease worries, and disqualify myths. These staff members prepare the class for the patient's re-entry into the school setting and help classmates better understand side effects of some medical treatments, such as hair loss, weight loss/gain, fatigue, and nausea. They also answer any questions that peers may have about the disease but are uncomfortable discussing with the patient.

School Consult

When a family needs to navigate the school system to obtain special services for their child, Children’s Health provides consultations for families to assess what their school concerns are and how their needs can be met. This program aims to assist parents and guardians with various school concerns or with issues that arise during or after a hospital stay. Their expertise can help facilitate school reintegration and successful transition of patients into their community school, help reduce the number of patients retained in a grade based on absenteeism by offering tutors and hospital-based schooling and provide the IDEA or 504 recommendations for educational services in a patient's community school.

Transitioning Back to School

If the child’s illness affects their appearance or ability to do certain activities, there are resources that will help the child adjust to the return to the classroom. Child life specialists are available to help ease the transition. The school re-entry program is designed to educate a patient's classmates prior to the patient's return to school.

ISSUES

- Within the hospital, only three people are in place to assist with educational needs which is greatly outnumbered by the patient population, and which will only be growing with the Plano Campus’ expansion in 2024.
- These three people are the only staff in place to assist with requesting a consult, alerting parents and providers to the breadth of their services, and to explain how it may be easier for public schools if their child withdraws, which may be because their office is quite removed from the rest of the hospital being located in the eating disorder unit in the specialty center and are not included in the listed offered programs or services on either the app or the website.
- There is only one page dedicated to the entire Plano Campus on the Children’s Health website, which already is hard to navigate.

DESIGN PROCESS

To improve the knowledge about various educational experiences available for children, I needed to get a better understanding of how the School Services Department works. I interviewed 10 experts across both campuses that held different positions including nurses, child life specialists, volunteers, and school service providers. My aim was to gain a comprehensive

understanding of each stakeholder involved in the extended stay pediatric patient experience, including their potential impact and areas of difficulty. While the challenge of accessing patients and their families initially prompted this approach, the process ultimately shed light on the often-invisible aspects of their stay.

I wanted to journey map, or create a complete layout of, the patients' experience from the perspective of the School Service Department starting from when they were first admitted through when they were provided the school service consult. Through my interviews, I was able to construct ecosystem and stakeholder maps that depict the functioning of each department and their provision of school services to affected families within the facilities. Moreover, I undertook an extensive analysis of case studies of other hospitals to gain insights into their school system offerings and delivery mechanisms.

Additionally, I had the opportunity to do field work shadowing Brooke Soard for a day at the Plano Campus who acts as the coordinator for these families, assisting them with all the required paperwork but also ensuring that they are going through the enrollment process in the necessary order.

***Preliminary Engagements*:**

Claire Gorden, child life specialists for Plano, brand new primary specialist for ICU
Michelle Harvey- Member of HEAL, Oncologist Education Specialist at Dallas Campus
Sam Killeen, Child life Specialist at Children's Department at Medical City
Michelle Gross, *Senior Development Officer* Children's Medical Center Foundation
Alexis I- Nurse at Cooks Children's Dallas

Emily P- Oncology Nurse at Arkansas Children's hospital

I started my design process by conducting preliminary interviews with six different hospital staff members within four different hospitals to understand where I was in my research and where my next steps should go. These preliminary engagements confirmed the themes of educational structures, mental health, developmental psychology, parents, and programs that I found within my secondary research. These conversations allowed me to better comprehend from a first-hand perspective of what the current processes and options are within the educational opportunities offered, have potential barriers explained by the professionals that face them every day on behalf of the patients' needs, and familiarize myself with other possible improvements that could be prioritized to this system in order to not only standardize this process but to also streamline it so that these obstacles are not as prominent.

This was a good launching pad, but I knew I needed to continue to funnel down to issues that would specifically affect Children's Health Plano and who I would be designing for. While standardization is helpful for leadership and people working for the hospitals to move paperwork through more efficiently, that does not necessarily mean that is the best way to ensure that the patients' needs are being met. So, are these opportunities and all the processes that they include for the patients or the leadership?

Expert Interviews

Jennifer Roady, Manager of Child Life, Language Access, Family Resource Library, School Services, and Volunteer Services for Plano

Kelly Ihejiawu, Manager of School Services and Library Services at Dallas

Brooke Soard, Education Specialist at Plano

My preliminary experiences led me to interview School Services management for Plano and Dallas Campuses which included a couple of different perspectives because of the size of their staff. I started the interview asking about how school service experiences could improve based on difficulties they have encountered so that they could also be compared between size and faculty accommodations. What stood out to me was the collective approach that Jennifer explained the Plano Campus used to carry out with team meetings that included one representative from each facet of the educational services so everyone was on the same page about what was happening, and questions could be asked and answered without the untimely chain of command. I immediately thought, what if, to do right by the patients, we design better organizational leadership communication guidelines? If the people connecting patients to the necessary services have a more efficient and open experience, it would ultimately create a better user experience for those who are relying on receiving those services. These meetings, unfortunately, were discontinued when the pandemic caused schooling to go virtual (or hybrid) because of the skeleton staff that hospitals were maintaining to help keep everyone involved safer. However, though the hospitals at the time saw a lot of these services as “extra” or “additional” rather than necessary, these meetings and prioritizing these services for the patients has not yet been reinstated.

Continuing my investigation into the effects this type of disorganization has on the students, rather than only focusing on the organizational impact within the facility as a for-profit

organization, I regularly spoke with Brooke Soard, one of three Education Specialists within the School Services Department at the Plano Campus, to understand what their day-to-day is like. Our conversations centered around the idea of awareness, with respect to the patient, which also echoed what Jennifer Roady had said. Brooke explained that "she wished she could put everyone who works at Children's in an auditorium and show them what the Departments does, how they do it, and why they do it." Awareness quickly became the theme and focal point of my design research as all the evidence, thus far, continuously returned to it. My in-depth interviews with Brooke further supported this. It was explained that the facility organization as a business is arranged in a way to follow the cash flow and funding but also the treatment of a person by department, but not collectively as one person being treated across departments: the lack of integration throughout the hospitals are causing patients to be overlooked, miss out on federally-mandated services such as schooling, and potentially prolong their stays due to the restart that happens with each transfer instead of layering treatment on the foundation of their initial inpatient services. Here are a few ways that a complete lack of integration works against the patients rather than for the patients:

- The lack of integration between department divisions, facility departments, and parents/guardians/patients cause a breakdown of information sharing and incomplete holistic services provided for the patient, often meaning that the patient is left without timely assistance or required/needed services beyond mandated timeframes.
- The lack of integration and modernization of recordkeeping and maintenance means that individuals from School Services are often going in person from room to room

throughout the entirety of the hospital to get required signatures on forms and paperwork to initiate patient services when guardians are often not with the patient or with the patient when School Services would be working as a position with standard working hours like the guardians' would also be working outside of the hospital.

- When a patient is transferred from one department to another, instead of using the information from the initial check in to build treatment onto, the patient is checked in as "new" meaning that if school services are flagged only after a 10-day inpatient stay but the patient is transferred after one week, then they will actually be hospitalized for a 17-day minimum before being referred for school services which can only increase in the length of time that they are missing out on their schooling if they are transferred back or to another successive department.
- The staff within the hospital are unaware of the services available to the patients and, therefore, are unable to get patients to the correct departments or are unable to help them understand that they have these services available at all.
- The lack of information about the School Services Department has also meant that many incorrectly assume that education specialists are from Dallas or Plano Independent School Districts, rather than hospital staff working as liaisons to bridge the communication and understanding of off-campus school services available for long-term stays.
- Narrative medicine is often overlooked, only sharing, or receiving information from nurses and doctors while talking around the patient instead of to them. This treatment of a patient as a number or a chart instead of a person with needs that ought/have to be met outside of only their treatments means that a generalized approach is taken to individual

illnesses though medicine, as well as life, is not one-size-fits-all meaning that this oversight only further exacerbates already severe concerns.

PROTOTYPE

Part 1: Because my design centered around the theme of awareness, I started researching change management processes, workflow management systems, and even various intranet platforms that could be deployed to connect the missing links in information across departments. All these research topics were great but how was I able to create change in a rigid and structured ecosystem? This is when my work really pivoted as I started to really change my mindset. I did not have to change the entire system but instead I could focus on an incremental improvement that could easily fit into the current system. This change in mindset led me to develop three guiding questions for my prototype.

1. How to spread awareness without adding to Brooke and her team's workload
2. How to design an incremental design within a rigid system without disrupting the current landscape
3. What is genuinely helpful to Brooke and her team?

Drawing upon my primary and secondary research, as well as my personal observations within the hospital, I became aware of the established culture surrounding staff's identification (ID) badges. Care providers often decorate their badges with Disney characters, additional informational badges, and interactive games to ease the anxieties of patients. For instance, some

badges feature various icons arranged on the badge so that practitioners can play a game of "I Spy" with their patients to help them relax while awaiting a procedure. With this insight, I approached Brooke and her team about the prospect of creating a unique School Service Badge that could be worn by the team and other employees at Children's Health. I believed that this design could foster awareness without disrupting or altering the team's existing practices.

This badge idea echoed a quote from Brooke Soard that came up in the very beginning of all my research: she expressed that in an ideal world she would “put everyone who works at Children’s in an auditorium and show them what we do and why we do it.” While it was not feasible to convene everyone in a single venue, the badge presented an opportunity to disseminate this information to staff members in their daily activities. The badge would integrate sharing and receiving information in an enjoyable and practical manner, fostering interaction not only among hospital employees but also with patients and their families.

After researching principles and best practices for visual wayfinding cues as well as how this “badge buddy” system at Children’ works, I landed on two different designs. One consisted of a badge that had universally recognizable icons that related to school on the front and another that had School Services in large and bold font. I did this because I wanted the badge to address the issue that surfaced of other caregivers at Children’s confusing School Services with the public school district workers. The rationale behind the design of the badge was to mitigate the issue that arose whereby other caregivers within Children's Health were incorrectly associating School Services with public school district workers. As such, the badge was intended to serve as a visual cue that emphasized the department's affiliation with the Children's Health Care system, and its

exclusive focus on patient support. By clearly conveying this message through the badge's design, it was hoped that the department's distinct identity and purpose would be more readily recognized and understood by all stakeholders. I also aimed to create a visually clear and universally understandable design that would quickly identify the department's purpose to parents, patients, and other employees. To achieve this, I incorporated familiar icons such as books, art palettes, pens, and paper clips to signify school-related activities. My goal was to ensure that the badge was easy to comprehend for all demographics, while still being non-threatening to patients. Unlike other badges worn by nurses that list their qualifications or procedures, I sought to create a badge that would not intimidate patients. In addition, the badge's back included important information, such as the department's phone number and available programs, to quickly inform parents and staff.

I was able to deploy these badges with Brooke at the Plano Campus on November 19th from 9:00 am to 4:00 pm. Brooke and I toured around the hospital across several different departments asking other providers if they would wear the badge or if this was helpful to them. We heard things like;

"This would be so easy to add to my badge and I get questions all the time from parents on all my badges so I bet parents would ask about this"
"We have a one pager of information, but we don't even know where it is. We could have this on us at all times"
"I would keep a stack of these on my desk!"

The responses garnered from the badge distribution were perceived as a positive indication of the efficacy of the awareness-raising initiative for the school services department. However, subsequent discussions with Brooke and her team brought to light an additional issue that required further testing. While the badge succeeded in raising awareness of the department's presence, it became clear that users needed more explicit guidance on *why* they might need to reach out to school services. The feedback highlighted that while awareness is a necessary first step, it is insufficient without a clear understanding of how to interact with the department.

Part 2

This led to a brainstorm session with Brooke and Jennifer Roady where we sat and drew on blank badges what I had brought to the official deployment. This co-creating exercise with Brooke and Jennifer allowed me to include the correct information on the badge in conjunction with the correct aesthetic design choice for that information. Brooke and Jennifer pulled up an example of a “safety toolkit” that most of the employees have on their collection of badges. We thought this could be an interesting idea to flesh out as we could create a “tool kit” of sorts for the School Services Department that indicated when to contact school services. This would create awareness not only around who they are but what they do and the various ways they support patients and their families.

This participatory design approach led to the second iteration of the badge prototype. The revised badge design maintained the use of universally recognized icons while seamlessly integrating with the existing marketing materials of the School Service Department. On the front of the

badge, I mimicked the library book icons on the materials I saw when I shadowed Brooke and utilized the familiar blue and red colors associated with Children's Health. I intentionally included the Children's Health logo close to the School Service Department to indicate that they were connected to the health care system. On the back, I included the eight reasons, specified by Brooke and her team, to request a school services consultation in large font and the phone number and email of the department below in smaller font.

After presenting this second iteration of the badge to Brooke, she distributed it with her team. The feedback I received ranged from "this is exactly what I thought it would look like" to "I want to send this to the director of Children's!" Brooke and her team ended up printing and distributing the badges across their office space and added a stack of them within the Family Resource Library. The co-creating exercise of the badge design allowed for a participatory design process, where Brooke and her team were actively involved in the creation of the badge. This not only gave them a sense of ownership over the project, but also allowed them to provide valuable feedback and suggestions that helped to improve the design. By involving the end-users in the design process, I was able to create a badge that better met the needs and expectations of those who would be wearing it. This participatory approach not only resulted in a better design outcome, but also increased engagement and motivation among Brooke and her team, who were more invested in the project and therefore more likely to push it forward. The positive feedback received from the team, including their eagerness to share the badge with others, further reinforces the importance of involving end-users in the design process through participatory design.

To gauge the effectiveness of the second iteration of the badge design, an informal measurement approach was taken, which involved soliciting feedback from Brooke and her team regarding inquiries about the badge. In the first few days following distribution, three nurses from the in-patient psychiatry program affixed the badge to their collection, while a volunteer at the Family Resource Library referred a patient's parent to Brooke after seeing the badge on her desk. These small but mighty successes underscore the importance of providing a design that aligns with the existing culture at Children's Health Plano, facilitating increased awareness and adoption by employees and patients alike.

DESIGN PRINCIPLES

Through this research project I was able to identify three key design principles to be included in future work pertaining to education services and Children's Health Plano.

1. Incremental Innovation: Instead of designing something to change the current system and structure of Children's Health, design *within it*.
2. Clarity and simplicity: The design should be clear and simple, with the use of easy-to-understand language, simple graphics, and intuitive navigation to help users quickly find the information they need. The design should also be consistent across different formats, such as brochures, posters, and digital displays.
3. Stakeholder Involvement: any designs should include feedback across multiple departments to have a holistic understanding of key gaps. When we designed the badge, we walked floor to floor to ask everyone involved for their input.

RATIONALE AND FUTURE WORK

Improving the education experience for long-term stay pediatric patients by increasing awareness for the School Service Department at Children's Plano is critical for several reasons and affects three major people groups in a trickle-down approach.

Brooke and her team benefit from this awareness as they can now improve their job performance by receiving more consultation requests and by having patients and their families directed to them. When more people are aware of what the School Service Department does, more support comes along and less children fall through the cracks. Also, providing educational opportunities for these patients can improve not only their academic outcomes but also promote their overall well-being. Thirdly, children who receive education during their hospital stay are better equipped to transition back to school and reintegrate into their academic community when they are discharged. Thus, research aimed at improving the education experience for long-term stay pediatric patients in hospitals can have significant benefits for the health, academic success, and future of these children.

This work is not only important to the patients affected by long term stays but also imperative for the parents, as well. Parents need to be aware of the support that is out there for their Child's academic success. This awareness and integration of knowledge also allows the parents to feel supported as well as a feeling of weight taken off their shoulders. They can then focus on their Child's physical and emotional needs while the School Services Department handles their academic needs.

Constraints

A significant challenge that arose during the course of this project was the inability to directly engage with long-term stay pediatric patients due to constraints imposed by HIPAA and IRB regulations, compounded by my status as a student. However, knowing these constraints as well as through my design research, I was able to pivot to my audience being Brooke and her team.

For future work on this, I would love to be able to take this research a step further by being able to conduct research on all users. Secondary research allowed me to have access to data already conducted, but because this is a human-centered project, I believe it would make this work more impactful on a larger scale if I was able to collect data from real patients and their families.

Furthermore, I would like to continue researching integrating information topics that include different uses of technology. Specifically, I would like to research the Children's Health app called "My Chart". This is the patient facing platform that is available via the app store that allows the patient and patients' families to have access to all kinds of information like billing, test results, medications, health and wellness articles and the ability to schedule doctors' appointments. This comprehensive app allows the patients and patient's families the ability to be connected to their medical records and take charge of their health. However, there is no area on the entire platform that includes any resources to inform patients on the services that Brooke and her team offer. I would love to explore the idea of including the School Services Department information so that patients could take an active role in their education experience. Patients could find resources available for them and possibly schedule their own consultation via the app.

FINAL CONCLUSION

To answer my initial research question, “How might we improve the education service experience for extended stay pediatric patients within public hospitals?” I concluded that Children’s Health Plano can improve the education experience for extended stay pediatric patients by creating awareness through providing accessible information about the School Services Department to providers and patient’s families throughout the hospital. This Human-Centered design research highlighted the efforts of engaging with internal stakeholders on the design and dissemination of a badge that takes into consideration workplace and patient culture, accessibility, and departmental navigation and cross-collaboration. Upon launching the prototypes of the badge, positive feedback was received from across departments and badge wearers reported appreciation for having simpler access to School Services information.

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Appendix