

Accessible Wayfinding : Empathy, human-centered design, and a blank slate.

ABSTRACT

Wayfinding and signage are important components of a building's structure and interior space for visitors with and without a mobile/physical disability, especially on university and college campuses. This paper documents a semester-long project where students in an upper-level design elective course identified a building on campus that had an inconsistent and missing wayfinding system. Documenting their ethnographic research and empathetic experiences, students were able to develop a wayfinding system based on research that focused on individuals with a mobile or physical disability. They produced and installed the system in the fall semester of 2016.

Keywords: wayfinding, graphic design, accessibility, disability, university

INTRODUCTION

The Society for Experiential Graphic Design defines wayfinding as information systems that guide people through a physical environment and enhance their understanding and experience of the space (Roux 2014). These systems are important components of a building's structure and interior space, especially on university and college campuses.

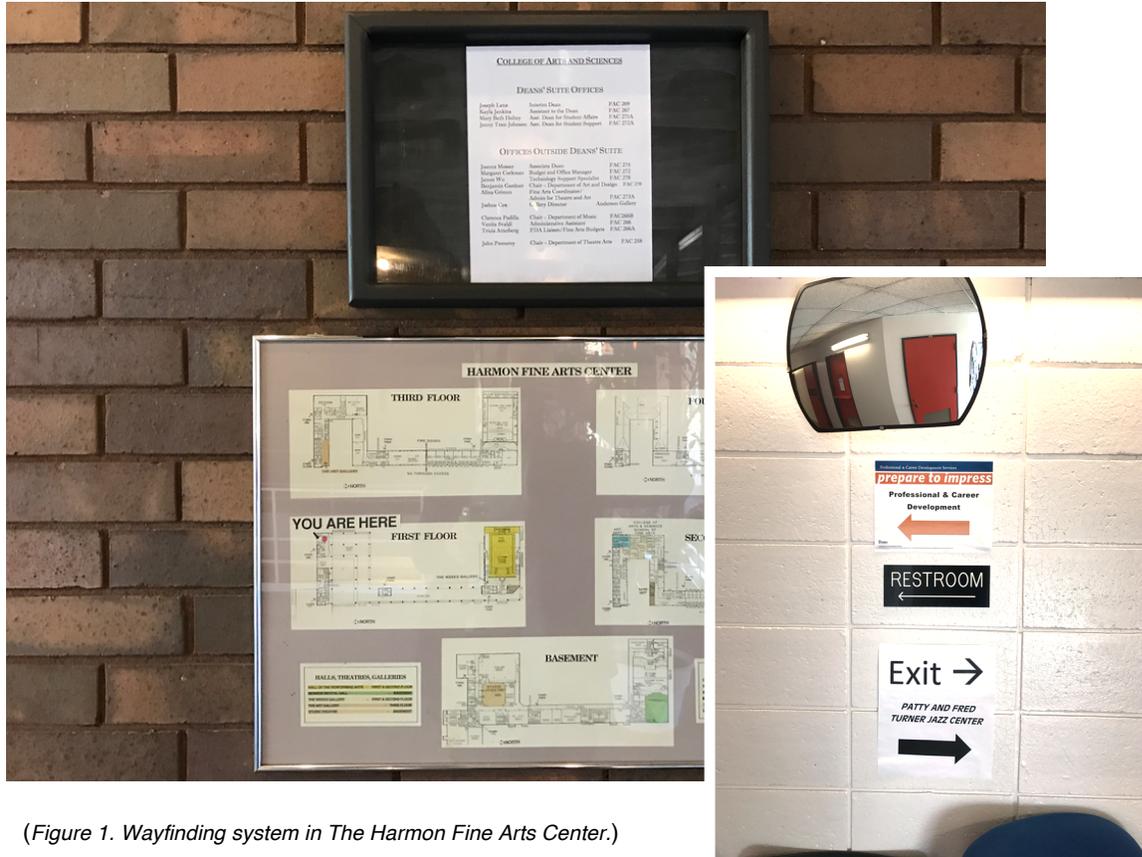
When they are missing, incomplete, or inconsistent those who enter the building are left confused and frustrated as they attempt to navigate the space. These feelings are intensified when a physical or mobile disability necessitates an alternative path.

Case in point, Drake University's Harmon Fine Arts Center (FAC). The 130,000sq foot, four-story building was constructed between 1970-72 by Harry Weese & Associates and opened to the public in the Fall of 1972 (Goodwin 1970). The Fine Arts Center currently houses the Music Department, Theatre Arts Department, Department of Art and Design, College of Arts & Sciences Deans' office, three performance theatres, Anderson Art Gallery, College of Arts &

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Sciences Office of Professional & Career Development, Department Chair offices, and classrooms.



(Figure 1. Wayfinding system in The Harmon Fine Arts Center.)

Visitors are welcomed by the current wayfinding system (Figure 1) and as they navigate through the building they find signage on printed sheets of paper and room number placards on doors. Visitors are also expected to make use of the universal knowledge that room numbers coordinate with floor numbers (ex. room 205 is on the second floor).

The building has four main stairwells to move between floors. Two of these stairwells are the only entry points to the fourth floor aside from the public/freight elevator. The third and fourth floors are blocked midway by art studios, with the fourth floor mid-building studio door locked at all times (unless access is needed by a person with a physical/mobile disability). The alternative routes around these restricted points are not practical or labeled and require a preexisting knowledge of the building.

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Dysfunctional spaces such as the north entrance which is an art gallery with stairs going up or down, and the south entrance that combines a box office, performance hall foyer area, hidden access points to the stairwells, and a two-story art gallery only add to these issues.

According to the *2010 ADA Standards for Accessible Design*, the Fine Arts Center is certified as an accessible building. For example, there are ramps that lead to the south entrance of the building from accessible parking spots, providing an unobstructed path of travel into the building. The south entrance doors are equipped with automatic push button doors, and throughout the building, there are alternative paths to classrooms and spaces, accessible restrooms, telephones, and drinking fountains (2010 ADA).

However, these routes are not practical or obvious. These spaces lack consistent signage that takes into account visitors with or without a mobile/physical disability. These are the issues that have historically made this building difficult to navigate and have resulted in a confusing, disorienting, and frustrating experience of the space.

Students identified and worked through this problem in ART 155: Research and Application during the fall semester of 2016. ART 155 is a senior level design elective course taught in the fall that focuses on depth of research in relation to a design problem. This course is intentionally set at the senior level for students to demonstrate their design skills and to understand the role and value of research in relation to a design project. This course includes the identification of a problem, methods and triangulation of research, application of research findings to design problems, and refinement of student design skills — making this project a perfect fit for student learning.

All students in Art 155 were senior design students with double majors in advertising, journalism, computer science, and art history. It was a small class consisting of seven students — Bryan Nance, Paul Brenin, Justin Atterberg, Emily Walton, Michael Lopez, Bridget Fahey, and Madeline Wittenberg — which made for a tight knit collaborative group.

Using *IDEO's Human Centered design philosophy* and *A Designer's Research Manual* by Jenn and Ken Visocky O'Grady, students were engaged in the discussion of systems, human-centered design, mapping strategic research directions, identification and use of macro and micro design research methods, the analysis and triangulation of research findings, the application of research findings to design and material testing, iterative design, along with the production and installation of the Fine Arts Center wayfinding system.

Spanning ten weeks, the project was completed and installed on December 8, 2016.

PROCESS

Wayfinding is defined as information systems that guide people through a physical environment and enhance their understanding and experience of the space (Roux 2014). Such systems make a

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solid connection to IDEO’s Human Centered Design philosophy, which is defined as a process that starts with the people you’re designing for and ends with new solutions that are tailor-made to suit their needs (IDEO 2017).

Focusing on the person and their needs — especially physically/non-physically disabled needs — became central to this project by adding another layer of research and consideration. To help students navigate each part of this larger problem they used the Big6 model (Figure 2) of information literacy as they worked their way through each level of the during the 10-week timeline:

Week 1: Research and update architectural maps of the building complete with room numbers and icons for points of interest.

Week 2-3: Research, develop, and design take-away maps of the building.

Week 4: In pairs, research and design a preliminary wayfinding system that gets a user to and from one point in the building.

Week 5-8.5: Collectively build on prior research to design one cohesive system that addresses all of the touchpoints identified in prior research

Week 8.5-10: Production and installation.



(Figure 2. Big6 Information Literacy Model developed by Dr. Mike Eisenberg and Bob Berkowitz from A Designer’s Research Manual.)

Week 1 : Architectural maps

In order to understand all of the spaces in the Fine Arts Center students needed to locate a layout of all five floors of the building (step 1). Immediately they went to the existing wayfinding maps (Figure 1) and found them outdated. The next step was locating the building manager for digital files (step 2), of which there were none. Only paper documents that have been copied over and over throughout the years existed.

Moving through steps 3-5, students walked through the entire building documenting and correcting current rooms, hallways, stairwells, access points, elevators, locked areas, entrance ways, exit doors, blocked areas, and non-public areas on the current map.

Once completed, they conducted an interview with the Building Manager to identify mapping needs. This revealed the need for current room numbers, room names, restrooms, stairwells, elevators, fire extinguishers, phones, and exit/entrance points.

Students proceeded to create new digital maps in Adobe Illustrator for ease of accessibility and future revision (Figure 3).

Step 6 was conducted in close partnership with the Building Manager. Both parties determined that the font (Helvetica) was legible at this size (9pt) and all items were labeled and spelled correctly. The final printouts were in black and white on tabloid size paper (11"x17").

Week 2-3 : Take-a-way map of the building

With the architectural maps completed students returned to the Big6 model to encounter a new challenge: creating take-away maps for visitors to use throughout the building.

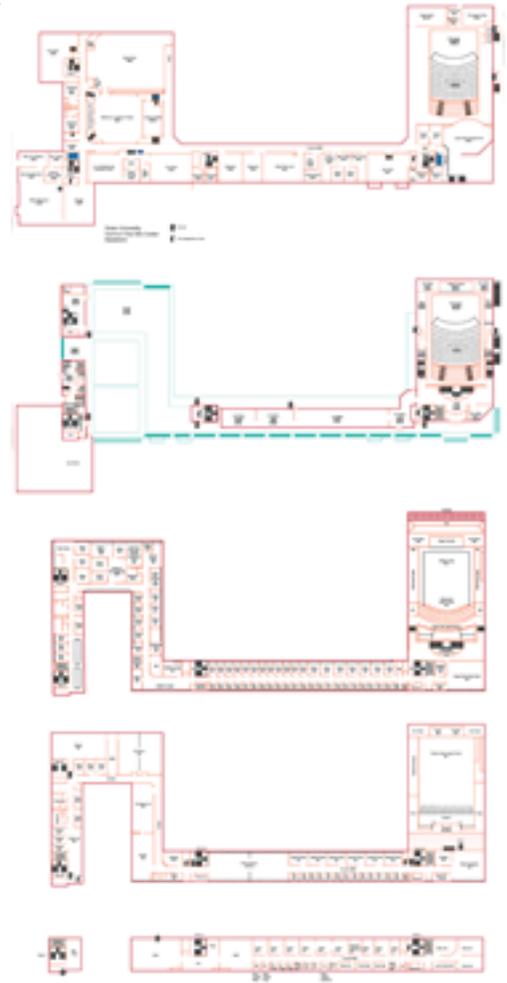
Since they had just completed architectural maps of the building, the redefinition of the problem was how to design take-away maps of FAC that focused on the user in a building that has inconsistent signage?

Applying their previous knowledge of the building, the style of the architectural maps, and contemporary design in wayfinding, students set out to design take-away maps of the building.

During this phase, questions surfaced such as:

- Do I split the building between north and south? between majors?
- What colors should I avoid/use for color-blindness?
- How detailed should I get?
- What size is the easiest to experience and use?
- Where would a visitor pick this up?
- Why would they be visiting FAC?

Students developed, and produced a variety of take-away maps (Figure 4) that included the necessary information to help a visitor identify paths around the building. The purple map (*top, second from left*) was chosen to accompany the final system.



(Figure 3. Redesigned Architectural Maps of the Harmon Fine Arts Center.)



Week 4 : Preliminary wayfinding systems

Students were paired and instructed to choose a room in the Fine Arts Center and create a preliminary wayfinding system to get a user with a physical disability to that room and back to the entrance. To help with this task ethnographic research was needed to find out how and why users move through the building in addition to visual research of the Drake Brand Standards for signage.

ETHNOGRAPHIC STUDIES - HUMAN CENTERED DESIGN

In an effort to understand the link between the interior space of the Harmon Fine Arts Center and its impact on wayfinding, students engaged in ethnographic research methods. Building on their own research experiences students identified a room in the building and documented their way to and from this point with photo ethnography. This served as formative research that helped them gain a better understanding of the intended audience's needs and behaviors (Visocky O'Grady 2009).

From this exercise, students began to understand and determine user touch points, decision-making areas, and where signage should be placed. For example (Figure 5) this student was navigating to the fourth floor painting studio and documented the frustration of locating stair 3, which is midway through the building and the only stairs to access the painting studio. Overall, students identified entering and exiting the stairwells and their access points as a major user touch point that was in need of wayfinding signage to orient the user in relation to the building and identify the major points of interest on the floor.

PHOTO
 ETHNOGRAPHY

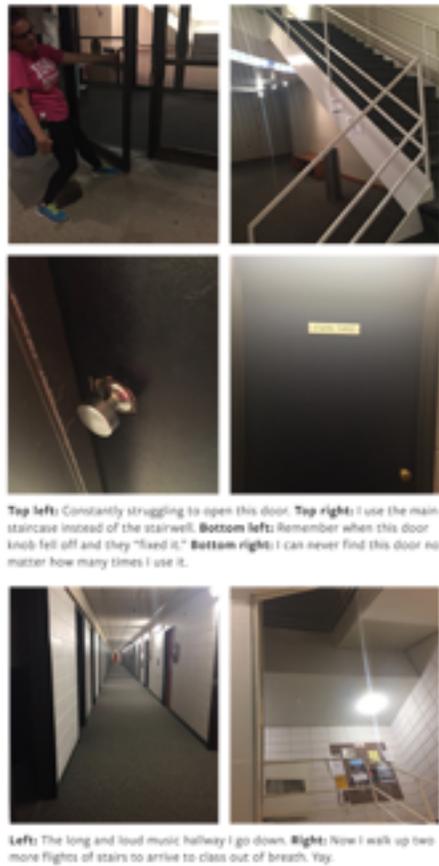


Figure 5. Emily Walton's photo ethnography research

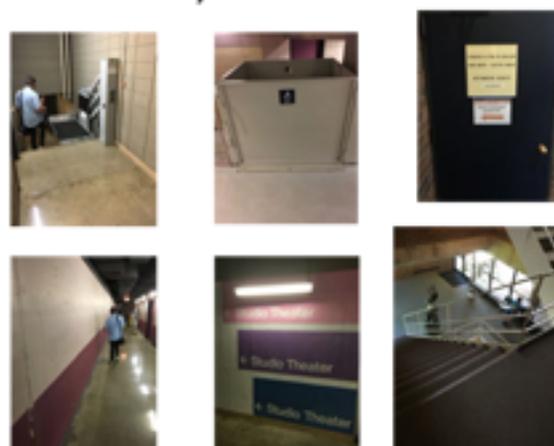


Figure 6. Paul Brenin's visual anthropology research

To better understand users and determine touch points, decision-making areas, and efficacy of current signage students also engaged in visual anthropology and observational research. Visual anthropology differs from photo ethnography by placing the camera in the hands of the researcher to document the perspective of the community under study (Visocky O'Grady 2009). Students assumed that most faculty, students, and administration would move through the space based on knowledge of prior visits to the building and that they would enter the building using the south entrance.

By documenting and analyzing visitor traffic through the building at various times during the day and week students confirmed these assumptions that a majority of students entered the building through the south entrance, which is the easiest entry point from other buildings on campus, vs. more faculty entering through the north entrance, which has the easiest entry to faculty and administrative offices. They found that the south entrance has multiple doors and access points, making it an overwhelming space for new visitors, but once in the space visitors had a

preconceived notion of where to go based on previous visits. They also noted that there were no signs to indicate access to floors or specific points in the building if a user was physically/non-physically disabled (Figure 5 + 6).

Upon reflection, students identified entrances as spaces that need a comprehensive wayfinding system to help orient the user in relation to the building and help guide her/him to the nearest elevator (if physically disabled) or nearest stairwell (if non-disabled). In the stairwells, students noted that users would need signage to indicate what floor they were on along with what floors they could navigate to by going up or down. Once on the floor of their choosing, students noted that signage is needed to indicate what end of the building users were at, where important rooms were on that floor, and what direction users needed to travel in. When en route on the floor of their choosing, smaller signage would be needed to help users continue to their destination.

PRELIMINARY SIGNAGE SYSTEMS + EMPATHY

The Drake Brand Standards guide (Drake 2016) defined colors for the College of Arts & Sciences as blue, salmon, and orange and specified Whitney and Iowan Old Style for the official typefaces. This brand standard pdf specified photography, photography color treatment, and editorial guidelines but lacked a specific section on campus interior wayfinding and signage.

Throughout this project, interviews were conducted with students, faculty, and staff about their needs and potential opportunities to address. Talks with the building manager, department chairs, and students revealed the need to develop a friendly and digestible wayfinding system that included overall points of interest.

Two interviews, one with Professor Maura Lyons and the other with Associate Professor John Fender (*both of Drake University*), put forth key information about the building's architectural history and outdoor signage initiatives.

From recent research for an upcoming exhibition, Professor Lyons was able to provide the original architectural renderings and specifications for the interior of the Harmon Fine Arts center complete with paint colors, finishes, and typographic standards for signage (Figure 7, Associates 1971).

Through an interview with Professor Fender, the students discovered a Campus Signage Design Standard from a 2006 campus outdoor signage initiative by the Landscape Architecture + Visual Communications firm Mayer Reed. They stated that the design of the signage standard was developed by drawing upon the rich architectural heritage of mid-twentieth century buildings designed by Saarinen that shaped both academic buildings and student housing on campus (Mayer Reed 2006).



Figure 7. Page eight of the Harry Weese & Associates interior standard guide for the Harmon Fine Arts Center.

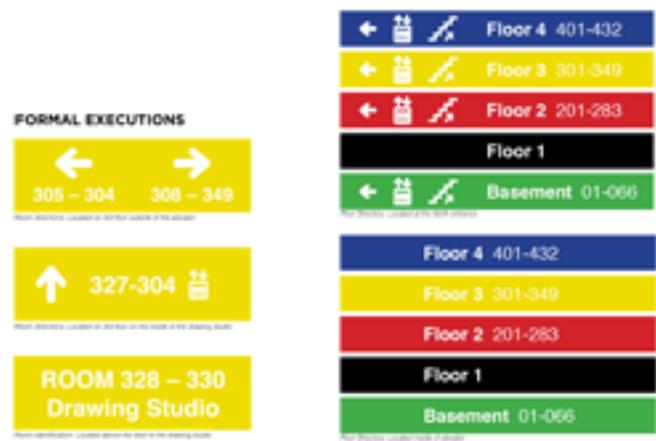
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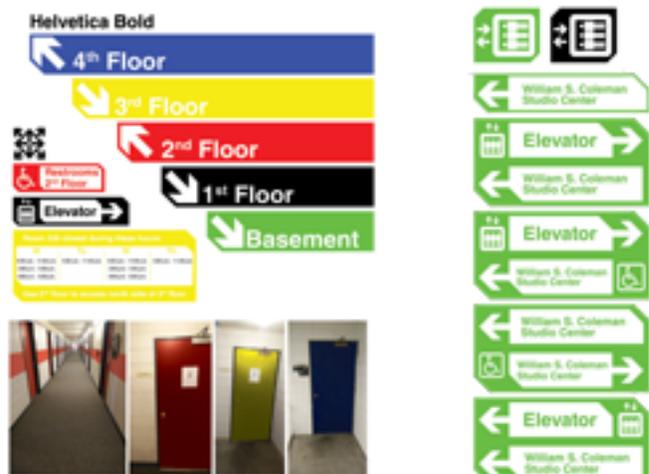
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8a. Group 1:
Emily Walton +
Maddi Wittenberg's preliminary wayfinding system to office 281(second floor)



8b. Group 2:
Justin Atterberg,
Bridget Fahey, and
Michael Lopez's preliminary wayfinding system to the third floor Drawing Studio



8c. Group 3:
Bryan Nance + Paul Brenin's preliminary wayfinding system to the William S.E. Coleman Studio Theatre (Basement Level)

This built on the historical qualities of the Drake University Campus with a proposed and accepted typeface of Futura Medium, rather than the Drake identity standards of the time (Mayer Reed 2006).

With this knowledge, students were paired up and tasked with creating a preliminary wayfinding system to guide a physically disabled visitor from the entrance to a specific room in the building and back again. Decisions on the placement of wayfinding signage were drawn from their ethnographic research findings. Color, typography, and icons were pulled from interviews and current signage design trends.

As you can see (Figure 8a-c) certain groups worked with current typographic design trends, and the other groups worked from the architectural design standards. To gauge the efficacy and efficiency of their wayfinding systems Michelle Laughlin, Coordinator of Student Disability Services at Drake, volunteered to user test the systems.

USER TESTING + EMPATHY

Each group posted their system in the Fine Arts Center and tested it with Michelle, who happens to be a person with a physical disability who is unable to use the stairs. Throughout each test, a dialogue ensued between all parties, giving the students insight into what was successful and could be better executed within their systems (Figure 9).

Group 1 (Figure 8a) discovered that the placement and location of their signage were well done but it lacked size and visual hierarchy, which made the signs blend into the wall. They also noted that a welcome directory at the entrance would have set the expectation of the signage throughout the building. Group 2 (Figure 8b) discovered that having a directory at the entrance and on the elevator helped Michelle orient herself in the building. Signage typography and color were easy to understand and coordinate with the existing floor colors of the building. However, when it came to the room signs, she indicated that they were not easily visible from a wheelchair and should include contact information for the Building Manager for access if the door is locked or closed. Group 3 (Figure 8c) discovered that the welcome directory at the entrance helped Michelle orient herself in the building and the typography and colors were easily understood. However she found that the elevator signage was missed due to the size and placement in the entrance. There was no indication on the directory what level the Theatre was on, and when she arrived, there was no signage to direct her to the lift access to the Theatre space.

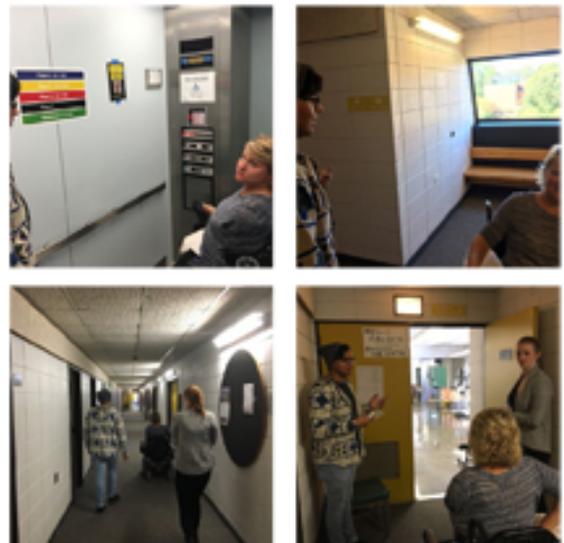


Figure 9. Students user testing their wayfinding systems with Michelle Laughlin.



Figure 10. Students experiencing the Harmon Fine Arts Center on knee scooters and in wheelchairs.

Upon debriefing, the students were inspired by the user's encouragement and the notion of how their wayfinding could continually and positively impact a large audience. They passionately discussed their systems and the building as a whole from the users' point of view.

To develop further empathy, I rented wheelchairs and knee scooters for the students to experience the building. As a class we navigated through each floor by using public and alternative routes. Students learned first-hand how a person with a mobile or physical disability would move through the building (Figure 10).

Using the public elevator to move between floors was expected, however, to get to locations on the third floor students needed to contact the building manager to provide a key to use the freight elevator from the second to third floor. Students rolled themselves onto the metal lined elevator next to a cleaning cart and waited as the metal cage doors were closed and they were lifted to the next floor. Once on the third floor, the elevator opened up to a computer lab that was previously a hallway. Depending on the time of day, a person with a physical or mobile disability might enter a class that is in session. Once off the elevator students rolled through the empty classroom and proceeded through a non-mechanical door into the hallway. The door to this lab is always locked due to liability issues and use of the freight elevator is possible only with the Building Manager present. For movement through that side of the building, students would have to rely on the building manager to let them in and out of the room and to use the freight elevator.

As we moved throughout the building students were instructed to observe their surroundings. From this perspective they needed to identify the height of their sightline, how others perceive and notice them, how they felt in the different spaces, and the difficulty of opening and entering non-mechanical doors. Students noted the difficulty in using the lift at the Studio Theatre, the dehumanizing effect of riding the freight elevator, no indications of which side the elevator will open causing students to exit backward, no indication of who to get in touch with to access the

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freight elevator and art studios, and an overall frustration with the lack of signage throughout the building.

This helped to understand movement through the building from a different perspective and assess any other human-centered needs for the final wayfinding system.

Week 5-8.5 : Condensing of signage style + type

Synthesizing all of the research and experience of the prior four weeks, students came together and were tasked with designing one cohesive wayfinding signage system.

Beginning with a signage standard, students reflected on their preliminary wayfinding system and incorporated the most successful parts of each one. Discussion ensued about whether to follow the institutions visual branding standards or stay true to the building’s heritage and architectural standards. Citing the original architecture plans and the precedent of the outdoor signage initiative, students decided to stay true to the building’s heritage. The fact that each floor of the building has its specified color palette that has been followed since its construction along with the architectural standards specifying Helvetica for the interior signage made a strong case to pursue this direction.

2ND ITERATION OF SIGNAGE - POST AND WALK THROUGH

Upon completion of the standards, students moved to the second iteration of the building’s wayfinding system. Exploration of size, color, color combinations and line length were printed to size and viewed from a distance to test readability and legibility (Figure 11). At this point, the class needed to decide on a take-away map to include in the system. The proposals were evaluated and narrowed down to the one that best fit with the established standards and user needs.

Collectively the class decided on the size, weight, and color of wayfinding signage. Students paired up and created signage for each floor based on the standard. The first floor needed a welcome kiosk design — constructed for both north and south entrances — that included space for building hours, a pocket for takeaway maps, and a large area for “At-a-glance” wayfinding that included points of interest on each floor. Drawing from their experience in a wheelchair, students determined an appropriate height for the kiosk and orientation for the north and south entrances.



Figure 11. Size + color explorations

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All floors needed large hall diagrams placed at the entrance to each floor, stairwell signs highlighting each floor's main rooms, mid-floor diagrams to confirm directions, and accessibility information.

Signage was printed on bond paper, to size, and hung up around the Fine Arts Center and tested. This served as a proof to check and confirm directional arrows, spelling, room inclusion, color, and overall wayfinding. At this point we made corrections directly on the signage and later found that visitors of the building participated in making corrections.

Once this was completed, a third iteration was printed out to confirm all corrections.

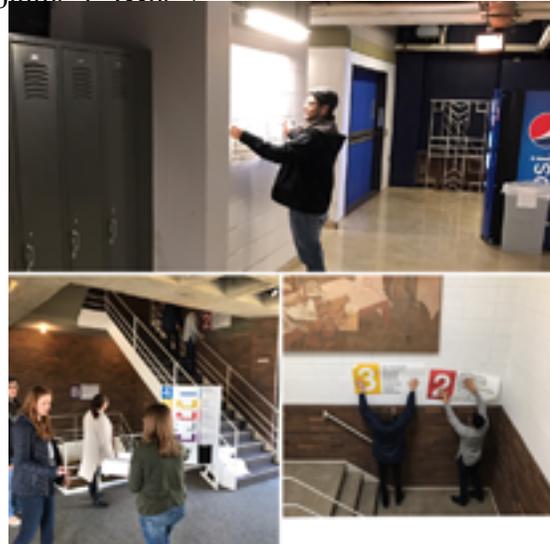


Figure 12. Installation of wayfinding system

Week 8.5 - 10 : Production + Installation

Students were responsible for production and installation of the wayfinding system. This not only served to allow students ownership of the project but to teach them the value of file prep, professional practice, color comping, and troubleshooting. The final wayfinding signage was printed on PhotoTex fabric paper on a Epson InkJet large format printer. Students found that this material had the right amount of tack to be nondestructive to the Fine Arts Center and would hold up to the buildings fluctuating temperatures and humidity. The semi-permanent nature of this material makes it easy to revise/update over time if room numbers or offices change. The wayfinding system was installed on the last day of class, complete with take-away maps and building hours (Figure 12, 14). Digital/interactive maps were created for future app/touchscreen use (Figure 13).

FINAL TESTING + USER INPUT

The final testing occurred a week after the system was installed. Again, it was tested with Michelle Laughlin, Coordinator of Student Disability Services. She commented on how thoroughly thought out the system was, how the signage colors immediately resonated with the floor colors, and the consideration of informative signage aimed at people with mobile or physical disabilities.

Months after this system has been installed users of the building (Facilities Management, students, faculty, administration) have continued to thank and congratulate the class on their efforts and visitors have used over 100 take-away maps to navigate the building.

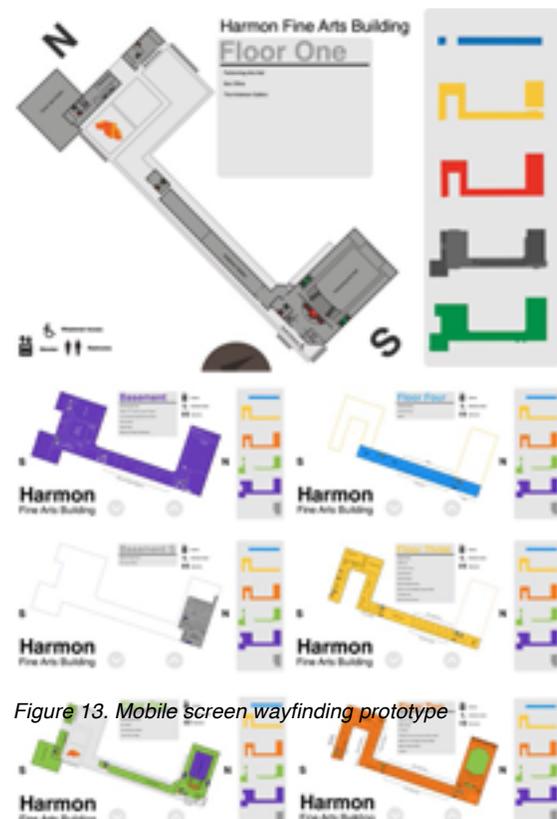


Figure 13. Mobile screen wayfinding prototype

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Furthermore the users of the building have become invested in the creation of this system and still feel the need to participate in critiquing and correcting signage as they see fit.

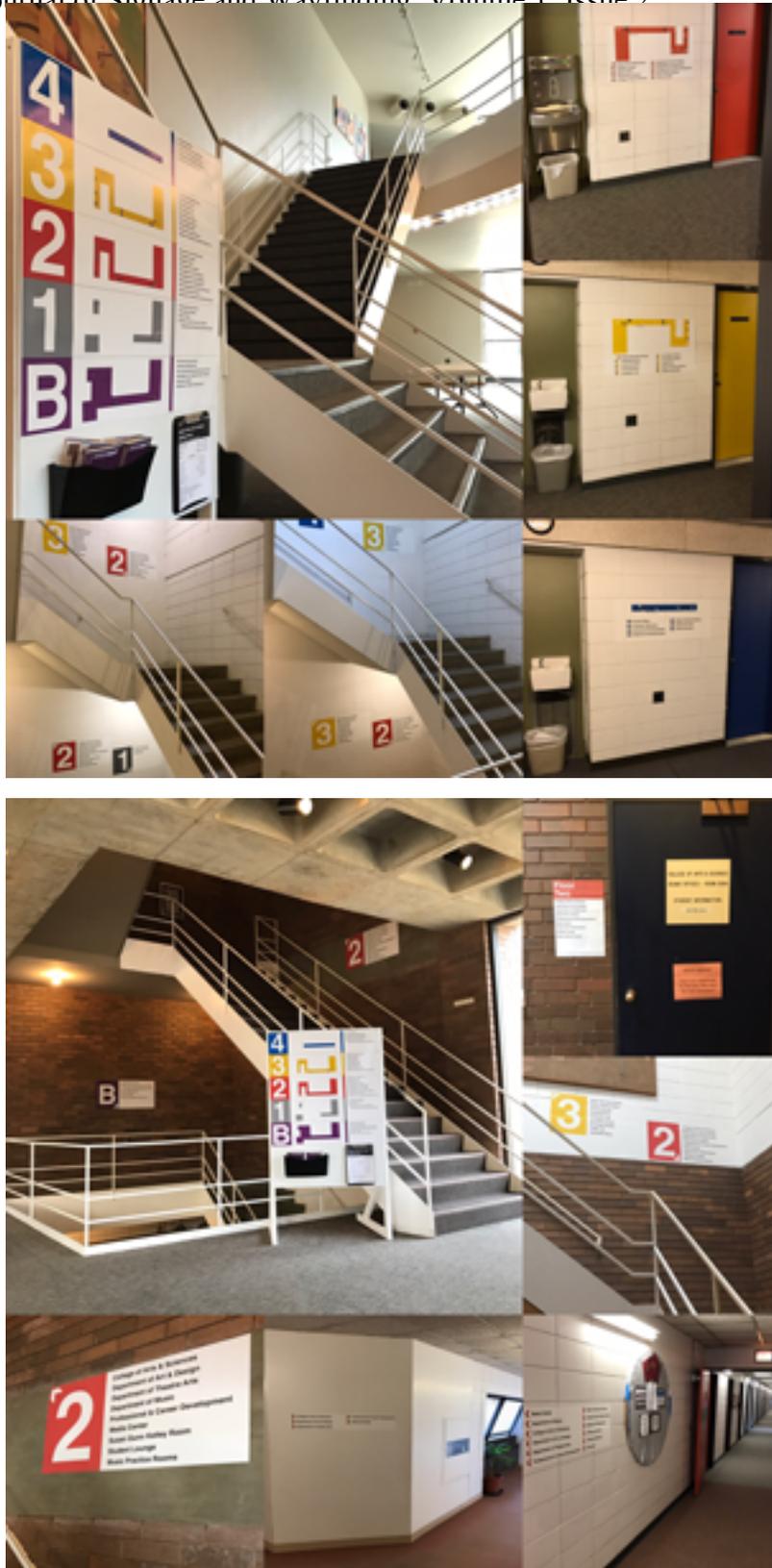


Figure 14. Fine Arts Center Wayfinding System

PEDAGOGY

From a teaching perspective there were many valuable pedagogical tools that were employed throughout this project. First and foremost was empathy. When the students piloted their first iteration and user tested it, they began to understand the users' needs and share their feelings from the users perspective, which helped them to look at the problem and understand the space from a different perspective. Seeing the importance and impact of their preliminary designs, students became self-motivated to engage and participate beyond earning a grade. However, it wasn't until they were in wheelchairs and on knee scooters — actually experiencing and interacting with the space and other visitors who were walking around them from the perspective of the user — did they truly understand the users' needs, feelings, and perspective of the space. This allowed students to compare and contrast mobility routes throughout each floor of the building as they began to realize how their identity, as a person with unimpaired mobility, was beginning to change. Emphasizing how identity is constructed, perceived, and portrayed would be a solid addition to understanding and expressing empathy.

Research and process were powerful tools as well. Knowing how to formulate a question and seeking out primary and secondary sources — library, online, observation — helped students identify paths of research and the value in seeking out information to answer the question even though it might not be used. For example: I am working on Accessibility because I want to find out what signage standards are available for physical impairments in order to understand how high signage should be placed in the Fine Arts Center. This question led students to an online search for accessibility standards where they found The Department of Justice's publication *2010 ADA Standards for accessible design*. Students vetted this lengthy document and found valuable information on how a building can be certified as accessible, but this document did not indicate height for signage placement. Even though this information wasn't directly applied to the project, students understood how their project fit within the larger context of architectural accessibility. As we had to work within time constraints, students missed out on developing quantitative and qualitative metrics to gauge the effectiveness of their system. Leaving two more weeks at the end of this project would have allowed for this final piece of research to be discussed and applied.

This brought up another pedagogical tool of vetting and analyzing information to understand what is reliable, relevant, and truthful (triangulating research). The more students researched the more they began to see overlapping themes and connections. For example, conducting ethnographic research and interviews allowed students to analyze and vet the relevant decision-making and pain points within the building, which determined the spaces for signage placement. They also drew upon their sightlines while in wheelchairs and knee scooters to determine the appropriate height of signage throughout the building.

Rapid prototyping was also a valuable tool throughout this project. Testing typography, point sizes, and colors of signage within the art building was crucial to identifying paths of travel and testing contrast within spaces. This pushed students to treat their ideas as non-precious and make

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decisions quickly based on space, research, and user needs. Scaffolding their skills from earlier courses where students are the users and decisions are impacted by peer and class critiques.

These pedagogical tools helped students to know and understand the larger context of their work, identify and construct a research path, analyze and apply a rich body of multi-disciplinary research to a design problem, and finally work through unforeseen issues quickly by rapid prototyping with a focus on user needs.

CONCLUSION

The goal of this project was for students to understand the value and application of a rich body of multidisciplinary research to a design problem. Building on this idea by focusing on visitors with a mobile/physical disability added depth and dimension to the research. Empathy played an important part to get student buy-in for the project and to motivate them to create work beyond rubric requirements and earning a grade. The students of ART 155 collaborated well together and successfully designed and installed the system on December 8, 2016.

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