

IMPROVING DESIGN INSIGHTS

EXPANDING VISION IN STUDENT PROJECTS

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Paper Abstract: My previous article from the 22nd DMI Academic Design Management Conference, *The Success and Challenges of the Double Diamond in Studio Projects*¹, went into detail describing the nuances of the Double Diamond design process. One request from that publication was to provide details on the insight generation and development process that was discussed in that paper. The purpose of this paper is to cover just that.

Observational research was one of the methods designers and design students employed to gain user empathy, understanding and insights into the problem or opportunity. In the classroom studio the time and opportunity for going out into the field for observational user research was very limited. It was not uncommon for students to carry out their research and return with only a superficial understanding of the opportunity. I have used the Insight Worksheet for over six years with students and have seen good improvements in the quality of their insights, their understanding of context and their collaboration within their teams.

The paper covers the unique definition of the elements making up the Insight Worksheet, it discusses the pluses and minuses seen from its use in the design studio, shares an example, and shares thoughts on next steps. The goal is for students to continue to care for the design process, to develop expertise with the design tools and methods so that they can continue to advance the 'state of design thinking' in their careers and in their professional practice.

Keywords: *Design Insight, Observational Research, Design Thinking, Design Method, Design Education*

INTRODUCTION

Insights are an engine for innovation. Some innovations just need one unique insight to achieve a big market success. Designers have long been studying and refining the process for generating insights. Folks from Zurb Design state that "Design Insights are breakthroughs that reveal behavior patterns and drive bold decisions. Design Insights are rare."² 'WOW' insights are rare but there are skills that can help designers spot them. One skill that is fundamental to insight generation is the art of 'seeing'. Seeing, yes using our eyes to see details that may or may not be obvious during contextual observational research.

The word 'seeing' as a verb is defined in Merriam-Webster's Dictionary³ as "noticing" - *to make note of something through the use of one's own eyes*. In design, the act of seeing is fundamental, and yet, research in seeing suggests that seeing involves different kinds of perception. Seeing and perception vary based on the person doing the 'seeing'. Two people can see the exact same thing or share the exact same experience and have two completely different interpretations of what they saw or experienced. There are also many factors that influence visual perception such as the optical

performance of the viewer's eyes, the brain's ability to receive, interpret and act upon visual stimuli, etc. In design, however, these differences in visual perception are valued and can provide new perspectives on both the seen and unseen world. While there is much to be said about the topic of seeing we will limit our focus here to how we see within the context of industrial design projects and insight generation.

This paper presents an approach to seeing in the context of observational research for the purpose of generating design insights. I have used this process of insight generation for over 6 years with Sophomore, Junior and Senior Industrial Design students at Georgia's Institute of Technology in Atlanta. The insight development process and techniques described here represent one way of teaching insight generation. The outcome of sharing this process is to help practitioners, faculty and students continue to develop and improve the insight generation process.

DESIGN PROCESS

There are many different design processes that students can use and there likely is no 'one' right way. Organizations tend to develop their own process or utilize an existing process in some adapted form. In my design studio, I covered a range of design processes and usually went with the Design Council's Double Diamond process as the overarching framework. The Double Diamond⁴ process is well researched, has extensive supporting documentation and it exists in the public domain. The first phase, called 'Discover', is where the Insight activities are typically initiated using a variety of empathic field research methods that focus on the end user. These methods include Identification of Key Users, Identification of Key Usage Scenarios, Field Observations, Journey Mapping, Persona Development, Empathy Maps and the Design Insight Worksheet for instance.

DESIGN INSIGHTS

The thing to emphasize is the fact that while we see the environment around us fairly well, we often miss many details. In the first episode of the TV show called Psych⁵, the dad, Henry, tests his young son's ability to see details in his environment. In this episode, they enter a diner and sit at a booth. Before dessert can be ordered, his dad asks Shawn, his young son, to close his eyes and tell him which letter in the exit sign was out, what was the waitress's name when they walked in, how many hats were in the room and what type? Shawn answered all the questions and brilliantly described the types of hats and gave an accurate count to his dad, Henry, who said the response was adequate. The waitress was impressed as I am sure I would have been. In this example, Shawn's dad as well as the waitress and the other patrons would have likely failed this test. It was Shawn's remarkable photographic memory and recall ability to see specific details in his observations that made Shawn's character a uniquely skilled and valued aspiring detective. A normal person walking into that diner, would likely not have seen or directed their vision toward seeing peripheral things without having something extraordinary calling out for attention.

In 1992, Arien Mack and Irvin Rock, two researchers at MIT, coined the term **inattentional blindness** to describe this phenomenon. Inattentional blindness is the failure to notice a fully visible but unexpected object because attention was engaged on another task, event, or object. [Mack, 1998]⁶

Inattentional blindness is common on many student assignments where on-site observational research is required. One way that students have overcome this is by using recording tools such as photography and video to be able to review and see things later that may have been missed while observing a usage activity. Observing activities in a small group has also helped. Multiple people provide multiple sets of eyes that see different points of view and perceive different key details for the activity observed.

Is there a way to improve observational skills? In my experience with contextual observational research assignments, I believe that there is. It starts with practice, specifically practicing structured observational methods. In *Figure 1*, there are two images of a clock. The two images look the same at a quick glance. Yet there are 10 things different in the clock on the right. Can you find all ten?



Figure 1 Find 10 things different in clock on the right.⁷

How does the search begin to find all ten differences? Maybe finding 2, 3 or 4 differences is easy but it gets harder as you get to 8, 9 or 10. Is there a search strategy? One way of finding all ten feature differences is to scan all aspects of both images critically and carefully. It could be a random scan or a right to left and up and down scan or the scan could be guided by the different shapes on the clock and

in the image. The idea is that the objective of seeing changes from a quick glance to a careful observation of the entire scene with mental notes to keep track of the count and other things. It is this careful observation process that needs to be instilled in students and carried into the field during the user observational research visits. Students begin to examine the entire environment for clues to uncover adaptations that users have made or to get a more complete sense of the user, task steps, challenges, unspoken needs, etc.

Getting a good insight is challenging for sure, but when a student sees one, then it can become an AHA moment toward solving a problem. In a way, generating good insights is a bit of a numbers game. The more insights a student can generate the more likely it is that there is something really big in the mix. Sometimes the stumbling block is just to get the first insight started and then completed. Just like a blank page can stifle a writer or a blank canvas stifle an artist. Students have to push through this and after a while it becomes easier and hopefully second nature.

One quick exercise I have used with students was to ask the class to form small teams of 3 or 4 students. I then ask them to go out to a quick serve coffee shop and buy a cup of coffee. Then come back to the studio and in a 5-minute PowerPoint presentation share their insights from this experience with the rest of the class. The students either ask permission to photograph or sometimes they covertly video tape to document to process. They create a journey map of the experience and create insights from either the Lows or the Highs in the Journey Map. Giving the students different exercises like this helps them to get more practice with detailed observations as does the sharing and discussion of different viewpoints. The students value seeing what insights other students generated, especially if there were any AHA insights. This helps to establish a solid foundation for understanding the purpose of observational research and insight generation. The saying that ‘two heads are better than one’ has some truth as it values collaborative teamwork in projects.

Additionally, students are asked to integrate other methods such as Rick Robinson’s AEIOU⁸ which was developed to help guide designer’s thinking through a problem or scenario from a variety of perspectives. The AEIOU method was first published in the early 1990s and has been adapted and republished many times and is included in the book “The Design Thinking Toolbox”. Each letter of the AEIOU method stands for an observational opportunity as described here as an example.

- **Activities:** What activities are being carried out?
- **Environments:** What does the environment look like, sound like, smell like?
- **Interactions:** What are the basic interactions between people and systems?
- **Objects:** What objects and devices are being used?
- **Users:** Who are the people being observed? How did they reach their goals?

Journey Mapping is another method that students are asked to apply to document the process activities, user emotions, tasks, time, opportunities, and other aspects of the user journey. Together these exercises and methods help students build a foundation for going out into the field to carry out

observational research or to dive deep into secondary research and apply the same skills. Next is the worksheet that we use to capture relevant observations and formulate insights.

THE DESIGN INSIGHT WORKSHEET

I developed this worksheet in *Figure 2* to help students with two things. First it simplifies the process of documenting their observations and insights because there are only six parts to complete. Secondly, it provides a level of consistency and professionalism to their presentations, especially when multiple students are working together.

The figure shows two versions of a 'Design Insight Worksheet'. The left version is a blank template with the following sections: 'Problem Title (noun adjective)', 'Author/Date', 'Photo or Sketch', 'One sentence describing problem.', 'Few sentences explaining why observation is a problem.', 'What is the implication for design?', and 'Sketches initial ideas.' with icons for a pencil, a hand holding a pencil, a hand holding a pencil, and a hand holding a pencil. The right version is a completed worksheet titled 'Painful Loading'. It features a photo of a person loading a washing machine. The text includes: 'Observation: Washing machine opening is low and user tended to bend over to load and unload - which strains lower back.', 'Extension: Low back pain is caused by injury or strain to a muscle or ligament. Common causes include improper lifting, lack of regular exercise, fracture, ruptured disk, or arthritis. Often, the only symptom is pain in the lower back.', 'Design Implications: 1. Raise washer to a more convenient height. 2. Angle washer to minimize bending.', and 'Design Ideas:' with four hand-drawn sketches of washing machine modifications. The ID number 'ID4071 Sera 11-29-17' is visible at the bottom.

Figure 2 Blank Worksheet on the Left. On the RIGHT is a completed Design Insight Worksheet.

There are six parts to completing the worksheet shown on the left half of *Figure 2*. (1) The first is to document the observation with a photo ideally or a sketch if a photo is not possible. The observation or problem should be clearly visible in the photo. Color photos work well especially when appropriately cropped to focus the viewers' attention on the problem. (2) The photo is given a two-word title consisting of a noun and adjective that should be generated to succinctly capture the problem's essence. A common noun⁹ refers to a person, place, or thing. The adjective¹⁰ then denotes a specific quality of the noun. (3) Third is a one sentence description of the problem. This expands on the two-word title by bringing in other factors such as context. Keeping this to one sentence helps to bring a focus to the observation. (4) Forth, the problem is expanded with a few sentences that explain why this observation is a problem. This section should also include a fact or data that supports the observation as a problem. (5) Fifth is the Design Implication. Here it is important to describe the possible impact either positive or negative on the design outcome. Typically design implications speak to the possible benefits of incorporating a solution. (6) Since this form is typically used with industrial design students, it is typical to have the students start capturing some potential idea sketches while the observation is fresh in their minds. (7) The only other optional item on this form is to have the author put their name and date on the form. Some students also include the project name as part of their boilerplate. This typically is done in advance as a form template and then approximately a dozen blank copies of the form are printed so that the form is ready to use. Other layouts of the form have been used and I have left it to the students

to generate their own version and to customize the form based on their personal preferences as long as they include all six parts.

On the Right half of Figure 4, we have an example of a filled in design insight from Sera's Washing Machine Design Project. This is one of many insights that she generated. The **Photo** shows a user at a laundromat in a bending over position that was causing a strain on the user's back as she was loading and unloading items from the washing machine. The photo in taken from an angle that clearly showed the user bent over while engaged in her task. The two-word **Title** described the problem succinctly. The **Observation** expands on the title by describing the context of loading and unloading. The **Extension** explains why this observation is important. The user's bent over position may lead to pain or more serious physical injury to the lower back. The **Design Implications** share two potential solution ideas documented in simple bulleted points. Finally, this example has four initial **Design Ideas** that were sketched out and attached to the form. These initial ideas may or may not survive the entire design process. The quality of the sketching is not important as long as the sketch conveys an important feature of the idea.

Students also used video clips to critically review and identify problems, insights and opportunities. Frames from the video were selected and printed on one page and then post-It notes were used for notating observations and insights onto the individual frames. It was not uncommon for students working on team projects to generate fifty or more insight worksheets completed on a design project when using video clips to analyze their video footage. When students generated large number of Design Insights the resulting project reviews became rich with multiple opportunities for innovation. After the design insights were completed, the resulting design ideas were evaluated in a later stage against the project's design criteria. This helped students to down select to get at the key design insights with the greatest value for the solution. In the process of diving deep into observational research and critical insight evaluation the students become Subject Matter Experts of sorts on their project. This foundation helped students confidently advance forward in the design process and in their utilization of other design methods. One other benefit is that in design reviews, the student was able to confidently answer many questions that came up during reviews and were able share supporting documentation related to why some features were incorporated into the solution instead of others.

SUCSESSES

Students have been receptive to working within structured planning approaches and utilizing the Design Insight Worksheet. In projects ranging from quick one day projects to complex semester long projects, students from Sophomore to Senior levels have had successful outcomes utilizing the Design Insight Worksheet. The casual feedback from students has included comments that the form and process has expanded their vision to see things they may have missed without the structure.

On team project students split up the tasks while conducting observational research. One person interviews the end user, one person is video documenting, another is taking notes and if other members are present, they observe and also take notes from different points of view. The team process has helped to capture richer insights, to better capture the voice of the customer and to bring team members to a common insight foundation from which to build ideas upon. The quality of the insights on longer projects has gone up given that students have more time for research and reflection. Students also mentioned that this type of insight documentation brought out a level of professionalism to their presentations that they like to have in their portfolios to showcase in interviews with potential employers. Students say that it helps to highlight their rigor in conducting user research methods and in utilizing their design thinking skills.

CHALLENGES

There were three main challenges that I have experienced with students at all levels. First is that many Sophomore students tend to work through their projects fast and loose and at times with minimal effort to generate ten design insights, the base requirement. While their Design Insights meet the technical requirements, the content can at times tend to be superficial by simply documenting the obvious. Students can easily miss the goal of finding the unique, unspoken needs of the user. So the time and effort of going out into the field to conduct observational research becomes a missed opportunity. This may be just a result of getting used to working within a structured process. The quality does get much better over time.

Second, students can get a good insight observation with a strong supporting photo. But then wait to complete all six of the elements in the Insight form until later. Later can turn into days or weeks and then the insight is no longer fresh which translates to skipping the idea sketches or just adding sketches that are on a more simplistic or obvious level for the insight. It just takes a little discipline to capture those initial idea sketches while in the field ideally or shortly thereafter.

Finally, with many student projects it seems that a breakthrough solution can be attained with just one AHHA observation that got captured as an insight. Unfortunately, these key insights are hard to see and identify. Even users themselves at times cannot articulate key issues and may not be able to articulate them even if asked since their adaptations to bad design may be perceived as normal behavior. Students are challenged to find these unspoken needs and convert them to insights. The good news is that students tend to know when they find good insights.

The goal within my design studio continues to be instilling a foundation based on integrating good design methods and instilling a passion for getting those breakthrough ideas and project solutions. I think the Design Insight worksheet plays an important role for students since it is easy to learn and use and students have demonstrated that they can continue to develop their ability to see the unseen and the unspoken user needs and to develop unique design solutions for their projects. Once a student

achieves success on one project their confidence tends to build, and they are better able to achieve continued success on project goals again on other projects moving forward.

CONCLUSIONS

I started learning about and using structured planning methods in 1978 as a Master of Design student at the Institute of Design at Illinois Institute of Technology as taught by Professor Charles Owen. The process was rigorous and allowed me to go deep into understanding and analyzing user needs. Since then, throughout my continued application of these methods my goal was to simplify these methods while retaining the essence. In the 6 years of using this version of the Design Insight worksheet with my Georgia Tech students I believe that it has gotten easier for students to integrate methods into both short timeframe projects and extensive senior level innovation projects. I am hoping that by publishing this paper that more students and faculty can use it and can continue to improve upon it.

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