

Project 2

An Analysis on the Pens in Our Lives

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Mind Map:

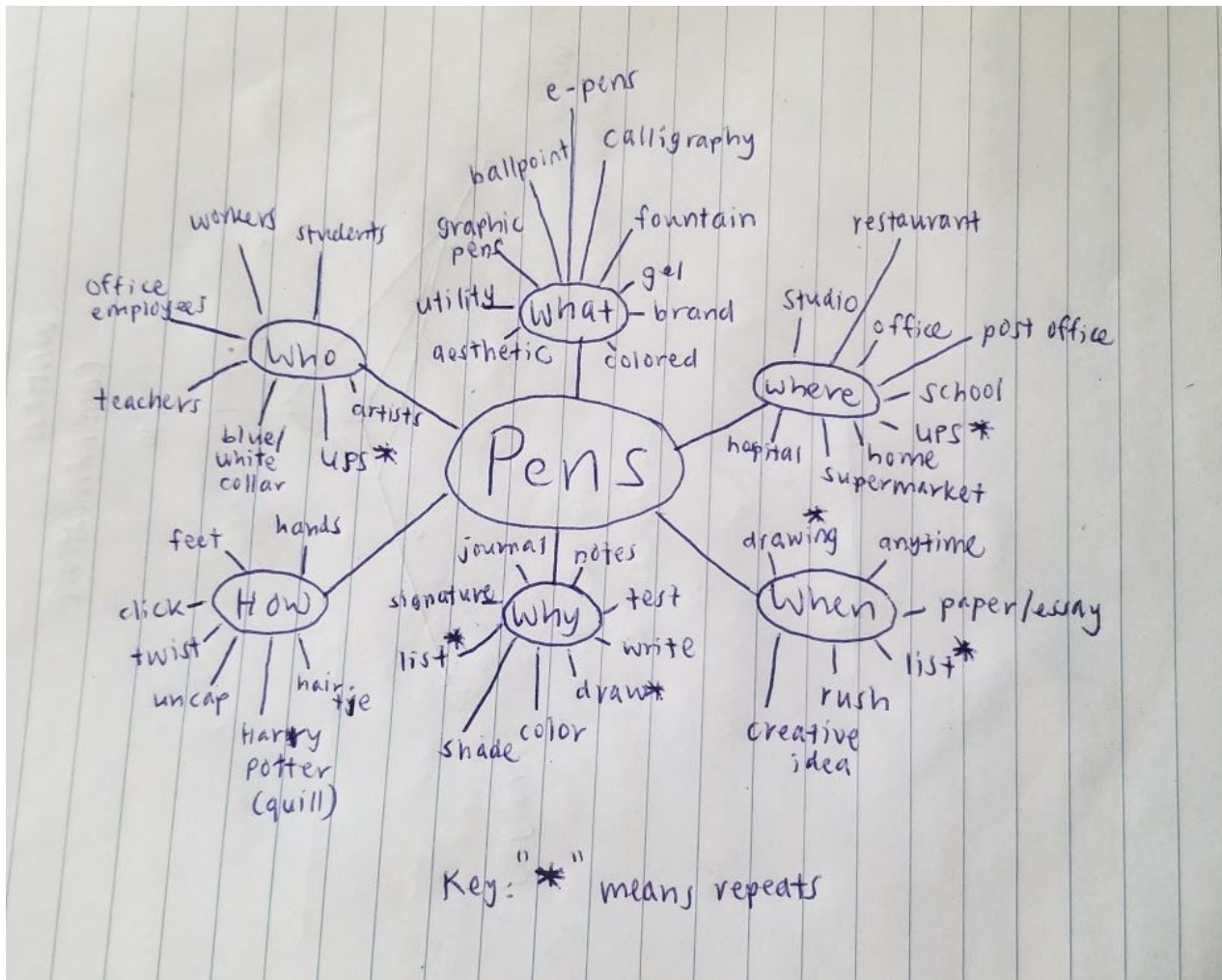


Figure 1.1: Mind Map of the 6 ways we decided to look at pen users

Data:

One of the stand out ideas while brainstorming for this project was the pen. The reason why we chose the pen is because at UCSD—and in most of the world—pens seem to be a standard option when it comes to writing utensils. Also, the pen has a lot of features and options that could be distinguished from one another, making it a very rich topic when exploring user preference. As we will see, certain design choices are often more preferable than others, and with good reason. Our group wanted to know why people use the brand of pen they use, what design aspects make the pens desirable, and what other factors are taken into account when buying a pen.

When evaluating the context in which a pen resides, our group thought it was the best idea to use a **mind map** (Figure 1.1). A mind map is simply a way to connect and create new ideas and existing ideas to a preselected concept. To evaluate this context, we decided to employ the five Ws: who, what, where, when, and why. Each one plays a critical role in understanding pen users, and the types of situations they use pens in. The main idea of “who” was that it was comprised of both blue and white collar workers, as well as students, children, adults, etc.. Essentially anyone who is either literate or has an interest in drawing something has used a pen at one point in time. In our **mind map**, the “what” was slightly more broad in order to get a feel for what is considered a pen. Beyond gel or ballpoint pens, we discussed E-pens as a discussion point, because of the recent technological advancements of tablet styluses; we also mentioned pens that are more traditional (calligraphy and fountain) just to have a rounded perspective on the types of pens. For “where”, we thought of typical locations one might use a pen: at school, at home, at the office. From the locations we were evaluating, our group began to realize that the pen has many applications that often times go overlooked. We thought about less conventional locations that might not be brought up at first: restaurants, post offices, and even art studios. The “when” further elaborated on these broad applications, specifically the pen’s usage. Pens are used when writing notes, essays, lists, and drawings. The uses we thought of are always in tandem with paper in some way. The “why” was slightly redundant to previous ideas. They were similar to those of the “when” category, yet it took into account the user more directly. For example, one of the ideas we explored for “why” was people using pens to shade, which could be tied into artists in the “who” category and drawing in the “when” category. The “why” gave us a more holistic goal of the user, because it tied many different W sections together.

One additional category we explored beyond the five Ws was “how”. How do people use these pens? We took into account the user, and also the types of pens. You’ll see in the mind map that there were references to caps, twist and click pens, but you might see some that are rather unorthodox. We tried to get outside of the box by exploring not only conventional applications, but also unconventional ones. The reason why we wrote down feet is because people might not have working arms, so using their feet might be one way that they can use a pen. Another way to use a pen that’s unconventional is as a hair tie. The length of the pen could be used as a supportive piece that could be tied around to keep hair up. Through the five Ws and one “how,” our mind map gave us a pretty clear understanding of the user, what pens are capable of, and the locations in which they are utilized.

As we were coming up with interview questions, we decided that we would follow the **apprentice-master model** so we can best learn about what our interviewees like regarding the pens that they use. This model makes the interviewer the “apprentice”, and formats questions so that the interviewee is the “master” and teaches us how to use his product. We also wanted to get an understanding of why the users enjoy the pens they use, and why they might not like a particular pen. The interview questions we came up with are as follows:

Interview Questions:

- Do you carry pens with you on a daily basis?
- Can you tell me and show me how you typically use your pen(s)?
- Do you use these pens for different things? (writing, drawing, multiple things?)
- Did you choose these pens intentionally or unintentionally? Why did you choose these pens/why do you not choose your pens intentionally?
- Is there anything about the design of your pens that made you choose these over any other pen or pens?
- What are some things you like?
- What are some things you don't like?
- Why do you prefer these pens over [loose cap/clicker pens]?
- Where do you store your pens when you are not using them and why?
- How long do your pens last?
- Can I take a picture of your pen(s)?

The questions we presented are very much based off of our **mind map** we created while brainstorming ideas. The first couple of questions were to stage the rest of the interview, and allow the user to consciously get an understanding about the pace of the interview. For example, the first question is framed to give the user an idea of where they usually keep their pens. Often times, people are so accustomed to using things in particular ways, that their **behavioral** level is active as they react subconsciously to specific things. We wanted them to be **reflective** when answering our questions, in order for them to understand why they do the actions they do. The third, fourth, and fifth questions were to get the interviewee to think about the design elements of the pens they use in an abstract sense. The fifth and sixth questions were specifically asked for the user to identify clearly their preferences in pen design. The last four questions were important in identifying whether or not the user prefers clickers or caps, and storage preferences, as well as durability.

*** Here is the link to the spreadsheet to the breakdown of our results from our interviews:
<https://docs.google.com/spreadsheets/d/1JiFfSGM2zImMBNVZNC5yCRIa2thNlu1TbxJ9-FCJMn8/edit?usp=sharing>

Trends and Tradeoffs:

After interviewing 13 people, we found some interesting trends that relate to design preferences, and certain situations that might require a specific pen choice. We also found out

about different design characteristics that were undesirable, and the reasons for them. One of the most common trends that we have found after interviewing a sample of 13 people is that 6 out of 13 of them really like the Pilot G-2 pen.

According to one user, the Pilot G-2 is a “fusion between a ballpoint and a gel pen” meaning the tip of the pen looks like a ballpoint, but the ink flows nicely like a gel pen. This seemed to be another trend we found in our interviews: 9 out of 13 people preferred a pen that uses gel ink instead of those that use ballpoints to distribute ink. There are some **tradeoffs** for choosing either a gel pen or ballpoint pen. **Tradeoffs** mean the losing of certain properties so that others are gained.

Typically cheaper, the ballpoint pen is a classic; it works by rolling the ballpoint at the tip across the paper, and the ballpoint distributes ink as it travels. One good thing about this design is that the ink distribution is not too much that it bleeds onto the paper. When using a ballpoint pen, the user almost never has to worry about excess ink on the paper. It also supports smooth writing. However, some cons about the ballpoint is that its ink distribution might be inconsistent when writing, for a couple of reasons: one could be air pockets in the ink capsule within the pen, another could be uneven pressure on the paper, mixed with the ballpoint not picking up the ink from the capsule. This unevenness can lead to a bad **experience** or the disconnect of the **Gulf of Evaluation**, where the user tries to understand why the pen isn't working after pressing it onto the paper.

The gel pen is quite different. To begin, it is typically more expensive and contains less ink than a ballpoint pen. It allows for a more polarizing color on the paper (darker/brighter than ballpoint pens) and strikes deeper into the paper. However, there are some drawbacks: writing too hard onto the paper can cause bleeding through, and the point in which the gel releases is often very reactive, meaning you cannot just leave the pen tip on the paper. Also, the tip in which the ink leaves is often sharper or smaller than a ballpoint pen meaning that it can rip the paper. 2 out of 13 people noted that gel pens often feel scratchy on paper, due to their distribution method not being as fluid, in contrast to ballpoints. Overall, 6 out of 13 people prefer Pilot G-2 gel pens to non-gel ballpoint pens, which is almost an even split. However, when taking into account that the preferred non-gel ballpoint pens were all different, it shows that there is a clear preference to what specific pen the sample set enjoys.

Another point of interest was that of the type of external pen design itself. The two main types were click pens and cap pens. Overall 9 out of 13 people preferred click pens over cap pens. The reasoning the users offered was often similar: click pens are easy to use and you can't lose the cap. Click pens have a high level of **discoverability** in the sense that the piece sticking out of the back can **afford** to be pressed down. **Discoverability** is the idea of the user being able to find out how the pen works through exploring the pen's features. If the user presses the down, they get the **feedback** (or response) of clicking down, and the ink cartridge locks into place so one can write. The users say that the clicker style is super easy to use, and offers a one hand access to the pen's ink. On the contrary, Capped pens were less common, taking up only 4 out of the 13 people interviewed. Capped pens are considered less desirable by the users interviewed because of the potential to lose them. Having a loose part is liable to be lost, which reduces the

value of the pen significantly. If the cap is lost, then the user has an active pen that could not be protected, meaning if the pen is stored it will mark ink onto anything it comes into contact with. The cap is used to prevent the pen from drying and from it marking anything while not in use. Another reason why caps are undesirable is because they require two hands to open and use: one to hold the pen and the other to take the cap off and put it on the back of the pen. The cap pen is considered inferior than the click pen because it's slower and takes more steps to use in the **Gulf of Execution**.

One other crucial **tradeoff** that we found was the price versus the quality. Basically, are users willing to sacrifice price for quality or quality for price or can they find a good balance between the two and settle on that type of pen? In this case, when people buy a pen, the ones that care will use the **knowledge of their head and the world** to figure out what is worth their money or what quality they can tolerate in exchange for the money they pay. Because pens are so common and so widespread, word naturally gets around on how good or how bad specific pens are and sometimes including more specific factors.

Problems:



Figure 1.2 Pentel BK440

After identifying trends within our interviews, we also noticed quite a few problems with pens, especially some that were quite consistent all around. Quite a few people who we interviewed listed one of the things that they do not like about pens or certain pens is that some pens' ink smudges easily and it makes the paper messy. Also, when they start to write with their pen, sometimes the ink will not come out and they would have to waste time trying to figure out what had happened through the **Gulf of Evaluation**. Finally, we also identified that most people who we interviewed have specific pen preferences but the issue is that the pen that they want is not necessarily available easily to them.

A really big issue we saw as well are clicker pens versus capped pens. The **discoverability** of a clicker pen is high while capped pen's **discoverability** could be low as caps can be lost or it may sometimes be difficult to uncap the pen whereas clicker pens are usually quite straightforward as the user would click it and the pen tip will appear with a good **feedback** of the satisfying 'click' sound. Although most clicker pens click open and retract at the same place, some clicker pens don't. For example, Cianna Calia's pen is quite unique as clicker pens go. Her pen is a clicker pen but it does not retract at the same place (*Figure 1.2*). In the designer's perspective, where they decided to put the retractor may be so for users to not have to stretch their hand so much to retract their pen. Unfortunately, the **conceptual model** (the idea the user has of how then pen works) for most users regarding a clicker pen is that it opens and retracts at the same place. Basically in this case, the **system image** is severed between the designer and the users. The **natural mapping** is the way pen is designed so that the

user is directed towards the clicker to do both the open and retract functions. However, when they find out it doesn't do what it is supposed to do, they have a bad **experience** with the pen.

Another problem is that there is a low level of **availability** of good pens on campus. What results is that these people settle with the pens that are available to them. For example, in UCSD, if the person lives on campus, the stores that are most available to them are the market in their college. Unfortunately, the pens that are sold in the market on campus are usually the cheap ones that many people dislike according to our linear scale below (Bic Cristal and Bic Round Stic M). Therefore, the problem here is that the pens they want are not available to them and when they settle for accessible ones, they become disgruntled with what they have access to. One example of this is the Muji pen. One of the interviewees preferred the Muji .5 capped pen, but they said that it was relatively hard to obtain. Muji pens are a Japanese import, so finding them is relatively difficult, since they aren't sold at common US stores like Target, Walmart, etc.. You usually have to buy them online, which might be a deterrent for the common consumer.

Another issue we found is when the user prefers using a specific type of pen (say a Pilot G-2 for example) but has to settle for using another pen in a particular situation. This came up twice. The first example was when an interviewee said that they prefer using the Pilot G-2 but they have to use a ballpoint for their lab experiments so that their carbon copy can pick up on the pressure of the writing (recall earlier that Pilot-G-2's have the potential to rip paper and bleed through so they can't be used for this.) Another specific scenario was one interviewee said that they have to use a ballpoint (even though they prefer a Pilot G-2) because ballpoints typically write thicker on exams, which can be picked up easier by the scanners the university uses. It allows graders to understand the answers easier.

Design Space:

This section goes into more depth about some of the tradeoffs between each pen. While we see some pens stay relatively consistent such as the BIC Atlantis of the Pilot G-2's, other pens such as the Mujis or the Zebra Z-Grips fluctuate when changing the variables of comparisons between pens.



Figure 2.1: A guide to all of the pens used in our design space and chart modeling.

Figure 2.1 is a general overview of what pens we took into consideration when looking at tradeoffs and comparisons between different pens in our design space. These were chosen mostly

because they consistently came up in our user interviews and/or people had either preferences for or strong opinions against them.

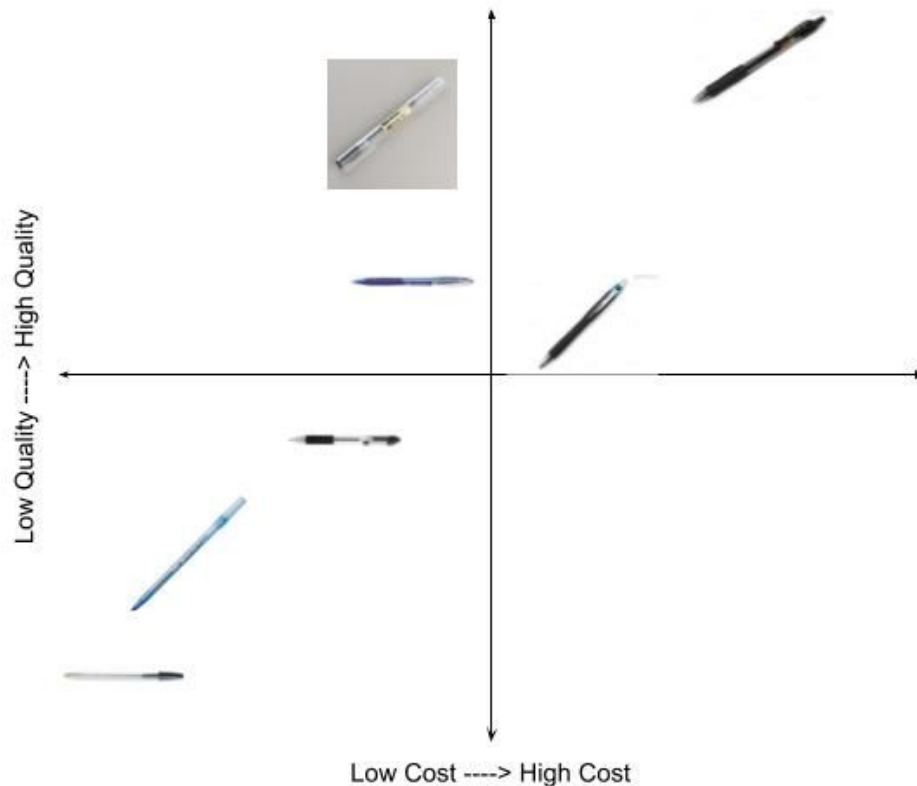


Figure 2.2: Design Space comparing Cost and Overall Quality of Each Pen

Figure 2.2 shows the design space of cost versus overall quality of some of the previously mentioned pens. This chart was made using user research, where a large portion of users interviewed (6/13) had a preference for Pilot G-2 Pens, indicating a strong desire towards its **affordances**, aesthetics, writing style and overall quality in general. However, relative to other pens it was on the pricier side for its design. In comparison, pens such as the BIC Cristal or BIC Round Stic M's were found to be extremely undesirable and of low quality with little to no user preference despite their relatively low price point. An interesting observation here is that the Muji pens have a low-to-mid cost point but still maintain high quality. While there was not a clear preference for these pens, many users indicated they were comfortable with using Muji pens, but perhaps not as much as Pilot G-2's.

The axis for this comparison were chosen because of user purchasing values, where many users want pens that are high quality and still affordable. Many of our interviewees stated they cared more about writing and pen quality than most other factors.

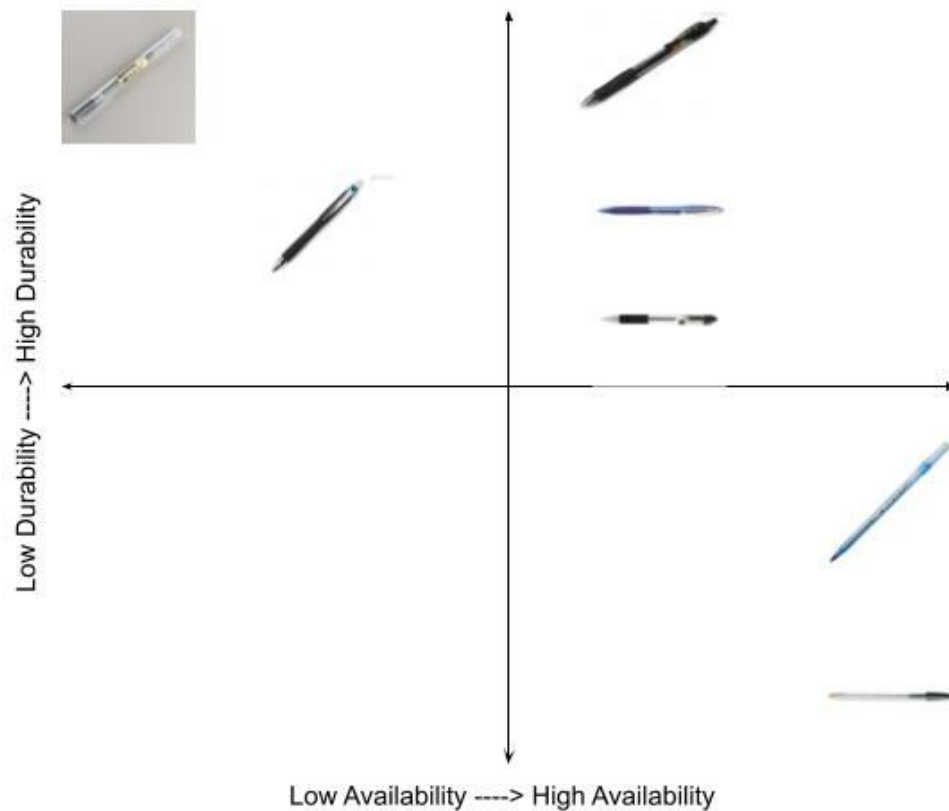


Figure 2.3: Design Space of Durability versus Availability of Pens for Purchase

Figure 2.3 compares the long term durability versus the ease of access for purchasing various pens. One of the main concerns some users have is that they don't like going out to buy different pens every month, but rather prefer consistency and long term health in their pens while still being able to find them easily if they need to be replaced. This chart shows one of the major **tradeoffs** for Muji pens is their extremely low availability to the consumer despite its high durability. They can't be found in normal office supply stores and are usually purchased out of the country or online. The golden standard Pilot G-2 however has both relatively high durability and availability. The BIC Cristal and Round Stic M both find themselves at the bottom of the trend line, with the highest availability and the lowest durability.

The axis for this comparison were chosen again due to user purchasing values. In this case, some users value the affordance of their pens to be long lasting and if they need to be replaced to easily be able to purchase them anywhere they go.



Muji Pen(Capped)



1

2

3

4

5

{Muji Pen (Capped): 4}

*Would We Go Back To Class If We Forgot This Pen: **Yes.**

Muji Pens are rated a 4 on the DEJ scale due to their reliability, high quality while still remaining inexpensive for users, and its consistency. Muji pens offer the same **affordances** in line weighting and comfortability as G-2 pens as well as their simple aesthetic design. The only reason it is not rated a 4 and not a 5 is due to the limit in color diversity as well as its availability to the user. The only way to obtain said pens are either visiting Japan or ordering them online so availability of these pens are very low compared to other pens on this evaluation. This along with the large user preference for clicker pens to capped pens dropped its score. Finally, the capped muji pen, although protective of its ink with an enclosed cap, our user, Michelle Wan still reports that she often fears that her ink will run out in the middle of an exam because from her experience, the pen's life span overall is only three months which is why the Muji Pen lost to the Pilot G-2 by one on our scale.

cristal because first, it is uncomfortable to hold, it has subpar ink that runs out quickly. It also has sharp edges, is made with hard plastic and finally even worse, has no grip to soften any of these negative features out. All in all, the Bic Cristal pen, at least to those who care, puts them through a bad **experience**. Also, the Bic Cristal is a capped pen and the cap has a small hole on the top which confuses many people and makes them stuck at the **Gulf of Evaluation** on whether that hole affects how fast the ink runs out or whether it was a bad design. The hole is ultimately an **affordance** indicating to the users that the ink will be affected negatively.

Critique:

The critique we received from the studio this past Wednesday included how to best structure our data and we were shown some examples as to how we can approach the analysis and visual communication of our data. We talked to Sunny who showed us her Project 2 example from last year and she gave us wonderful guidance on how we could potentially structure our Project 2. We included a spreadsheet laying out our data that was collected from the interviews that we conducted. Also, along with the design space that were shown to us as examples during studio, we made a DEJ linear scale representing the rating of different branded pens.

Writing Hub Confirmation Link:

<https://drive.google.com/file/d/188EfW9oGeFhvPQtXA1kWzXyyatZZYzV1/view?usp=sharing>

Contributions:

Emad Abdulwajid:

I interviewed three people: Anahita Dasgupta, Alex Morrow, and Andrew Kim. I worked on the problem section, and I created the DEJ scales in our ideal product section and the graph within the design space section. I transferred all of our raw interview answers onto a separate google document (see blue link below). I went to the writing hub and received more critique on our project. I wrote all the descriptions for the figures that are identified in the document above.

Doris Liu:

I interviewed four people: Cianna Calia, Michelle Wan, Erin Wu and Erin Lee. I wrote and uploaded the mind map, I briefly wrote the explanation of how we came up with our interview questions. I started the spreadsheet for our data and uploaded all of the pictures within that. Then, I wrote the problem section and the tradeoff section and elaborated on each description of the DEJ scales which visually described our ideal product. I wrote half of the critique section and explained why we chose to use a linear scale for our ideal product section.

Justin Marquez:

I interviewed five people: Kaelah Wilson, Andrew Mueller, Nathan Kryvoruka, Yen Nguyen, and Matthew Stepanek. I came up with the format for our spreadsheet and that really helped us visually see the ratings for each type of pen we decided to cover. It in making the graphs, writing our analysis, and creating the DEJ scales. I wrote the data analysis on this document and the trends section as well. I put in our pictures for the pens on the DEJ Scale and labeled each one.

Raw Interviews Document:

https://docs.google.com/document/d/1rqLi8DJPl6W5YjYqwe5SIeaUL4YaQMDW_f3fF1v7BiM/edit?usp=sharing