Portfolio of UX Research & Design Development (M5X01239)

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Introduction

In this portfolio I will be researching different designs of potato and vegetable peelers. I will also be researching design development. My aim is to look at existing peelers both straight peelers (type A peelers) and 'Y' shaped peelers (type B peelers) and look at their strengths and most importantly weaknesses. The ending result of this will be two new products created by me to suit people with arthritis and other problems with grip strength and loss of dexterity. These products will be adaptations of the traditional peelers and be put to the test against their opposite, this will result in user experience scores that will determine if the existing products are better than the ones designed by myself. I will share and document all of my research and discoveries along the way in this portfolio and come to a conclusion if there is a demand for the newly created products. I will use a diverse sample group in order to drive my design development of the new products.

Arthritis

Firstly, it is very important to understand the definition and effects of arthritis on people, so that I can begin to visualise a product that confronts these affects and aims to better the use of peelers. There are two types of Arthritis, which are Osteoarthritis and Rheumatoid arthritis. These have a wide variety of effects on people and it's important that my product can possibly accommodate most conditions and affects. This will ensure a wide range of users and create a much larger target market.

"When the joints are affected by arthritis, activities of daily living can be difficult. Arthritis can occur in many areas of the hand and wrist and can have more than one cause." -https://orthoinfo.aaos.org

Osteoarthritis

- Most common type of arthritis
- Affects around 8 million people in the UK
- Affects smooth cartilage lining
- Leads to deformed hands in severe cases
- Loss of grip partially/completely
- Wear and tear in joints
- Poor mobility
- Pain and swelling

Rheumatoid arthritis

- Affects more than 400,000 people in the UK
- Occurs when the body's immune system targets affected joints.
-Inflammatory disease
-Painful joints
-Loss of dexterity and grip
-Affects all joints in the body
https://www.nhs.uk

UX Design Research

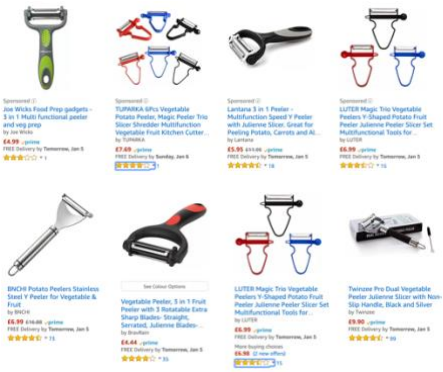
Secondary Research

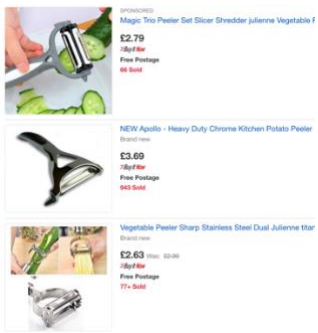
In order to decide what product, I was going to design that would address the difficulty that people with arthritis have when peeling vegetables with existing peelers. First, I had to look at the existing peelers that were both made for normal everyday use and adaptations for people with arthritis or loss in grip and dexterity.

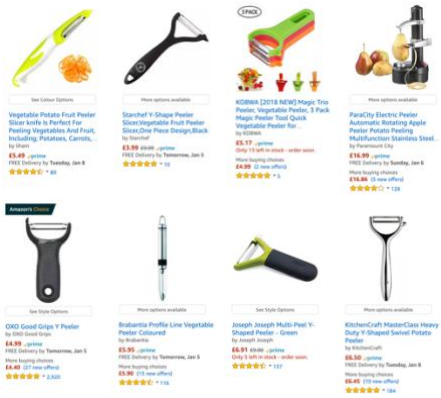
I started off by researching products made for people with loss in grip and dexterity, more specifically people with arthritis. I had found a website called ‘Active Mobility’ this was a company that was founded in 1989 by Nigel Arnison. Arnison is a sufferer of arthritis and this was his motivation to create products that were tailored to people with hand conditions such as himself. While looking at his creations there were only a couple of vegetable peelers and they seemed to look exactly like current peelers but with wider grips on the handles. Although these products created by Arnison were helpful for some conditions, they did not accommodate severe arthritis where the user’s hands aren’t capable of bending at the joints.

These are the ‘Good Grips’ peelers created by ‘Active Mobility’ as you can see, they look like a chunky version of the average every day peelers. They do work for a limited amount of hand conditions as the grips are made wider to ensure a better grip, but I believe there is a better way to create a peeler that accommodates more people with and without disabilities.

I then researched websites such as ‘Amazon’ and ‘ebay’ to see what peelers are on the market for everyday users. I also went to Tesco’s and had a look what they had on offer too and there wasn’t a vast amount of range. Here are the types of peelers I found.







Primary Research

Baseline peeler type A

This is the type A peeler used in my secondary research and was the baseline for straight peelers that was tested against the concept type A peeler. It is very important to have a baseline peeler in order to ensure consistent and honest test results. This peeler is made from stainless steel and rubber. This combination provides a stable and strong peeler with good grip. This peeler has a very balanced weight and feels good in the hand.

Baseline peeler type B

This is the type B peeler used in my secondary research and was the baseline for 'Y' shaped peelers that was tested against the concept type A peeler. This peeler is made from the same stainless steel and rubber as the straight peeler. This combination provides a stable and strong peeler with good grip. This peeler has more of a weight to it and I believe this is to improve handling of the peeler.

In my primary research I used empathy modelling to test these existing peelers and get a very basic understanding of what it would be like to use these products with limited/restricted grip strength and dexterity. I recorded myself peeling different shapes and sized potatoes and carrots to see the effects these restrictions had on me. The empathy modelling consisted of me tapping up my finger joints and knuckles at specific points often affected by arthritis and then put on a pair of gloves. The tape was meant to loosely simulate effects of arthritis and the gloves were placed on to recreate loss of dexterity. I also did the same test but without the empathy modelling so with no tape or gloves, this was done to create a baseline of typically normal behaviour and results when peeling vegetables without any loss of grip or loss of dexterity. Pictures were taken in order to show the difference in difficulty of peeling vegetables with a condition such as Arthritis and also without a condition such as arthritis.

Without Constraints

With Constraints

After completing the two different tests I noted down how they both went and what I found difficult about the peelers both with and without constraints.

Without constraints

- The straight peeler took longer to peel vegetables and was holding peel in the blade.

- The straight Peeler did better on curved surfaces and couldn't get grip on flat surfaces.

- The 'Y' shaped peeler was faster and easier to use while peeling carrots but was slower on
Potatoes.

- The 'Y' shaped peeler got rid of peel quicker; this made it easy to carry on peeling without
having to stop and clean the blade.

- When cleaning both peelers the 'Y' shaped on was much easier as the blade was not enclosed
as much as the straight peeler, this one was very difficult to clean.

- When cleaning the straight potato peeler, I cut my hand on the blade this is something to note
while designing a new peeler.

With constraints

- The straight peeler was very slippery and very hard to grip on to it due to it's slim design and choice of materials.

- Both peelers took a long time to initially grip as well as peeling, during peeling I had to constantly readjust the position of my hand in order get a safe grip on the peelers.

- The 'Y' shaped peeler had slightly more grip as the handle was a bit wider, this helped a lot while dragging the blade down in order to peel.

- Both peelers were a bit heavy this had benefits and also downsides, the weight helped to put force on the vegetable in order to cut but when holding for a while could add to the stress on the hand already caused by the restraints.

- After getting both the blade and vegetable wet it was increasingly harder to hold both the peeler and vegetable, on several occasions I dropped the vegetable. Loss of dexterity and grip was the main cause of this.

These tests were repeated in university and in different houses in order to create a diverse sample group for the existing products. There were 10 participants overall that all noted down their personal findings too by completing a questionnaire to create a pool of very useful results.

UX Design Development

A questionnaire was created in order to capture the thoughts of the participants during the testing. This resulted in an interesting pool of results that highlighted issues of the existing peelers. This drove my design development.

This was the questionnaire given to the diverse sample group.

Questionnaire

What is your age? (please tick box)

15-25 ☐ 26-36 ☐ 37-47 ☐ 48-58 ☐ 59-69 ☐ 70+ ☐

What is your gender? (please tick box)

Male ☐ Female ☐ Other ☐

What is your dominant hand? (please tick box)

Right ☐ Left ☐

When peeling vegetables which one do you prefer to use?
(please circle)

What material would you prefer for the potato peeler handle to be?
(please tick box)
Plastic ☐ Metal ☐ Rubber ☐

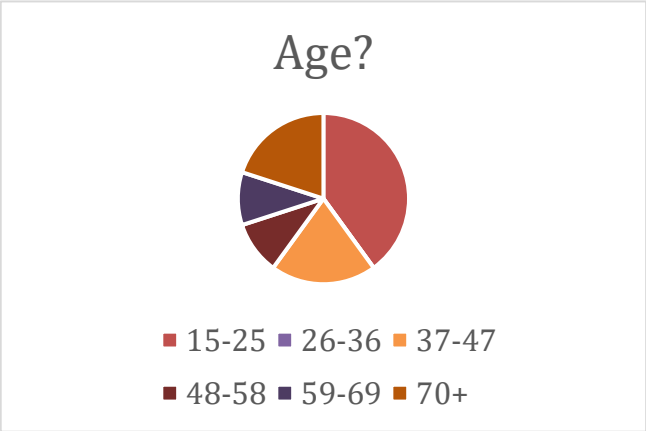
Do you find these peelers hard to clean? (please tick box)

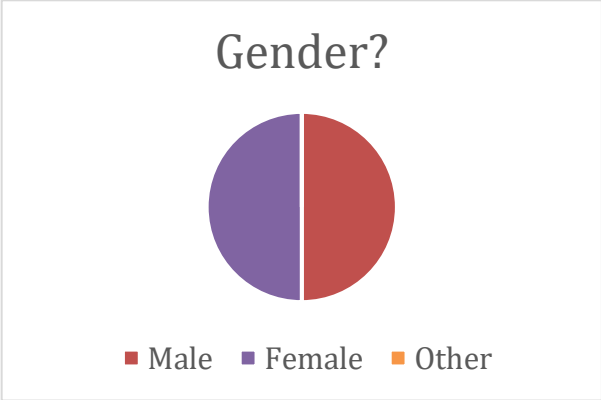
Yes ☐ No ☐

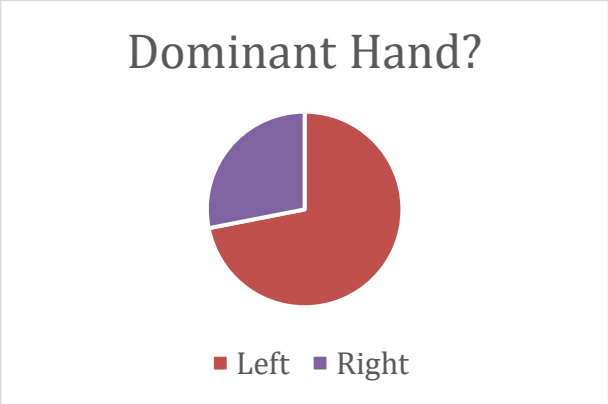
What size do you prefer these peelers be? (please tick box)

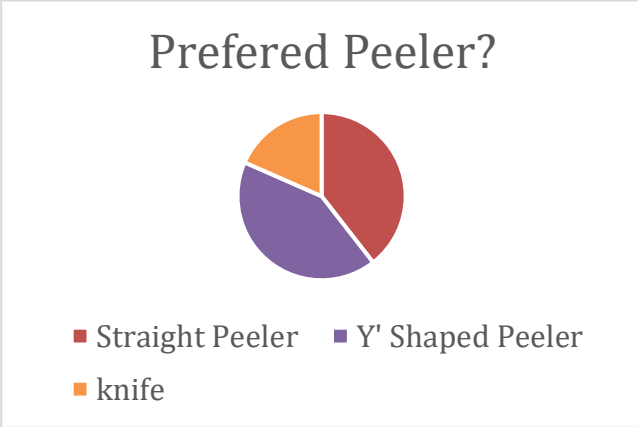
Smaller than the hand ☐ Same size as the hand ☐ bigger Than the hand ☐

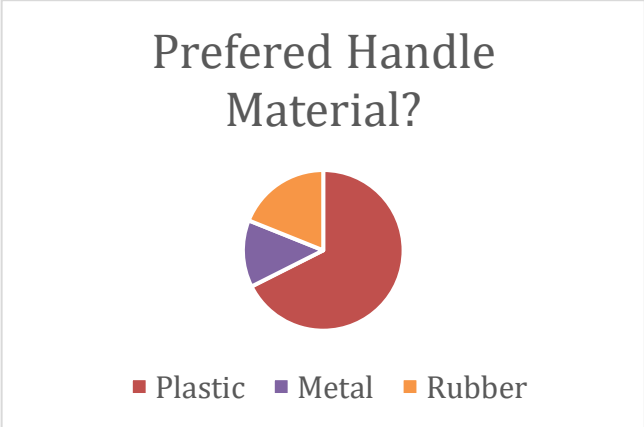
Questionnaire results

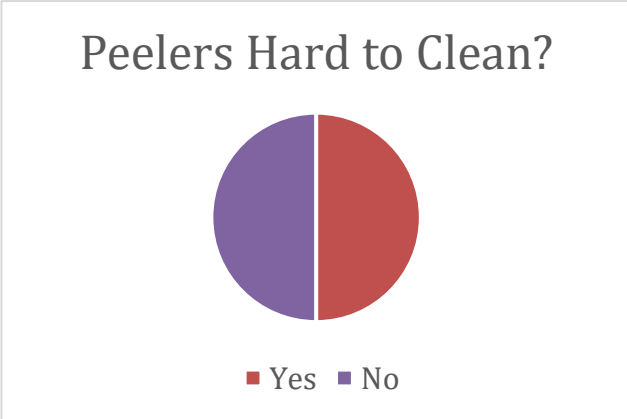










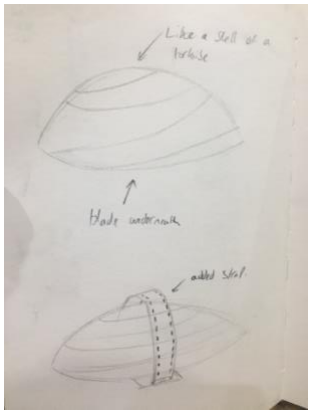


These test results show a clear path of what I need to design, in short the requirements I need to meet are as follows : create a peeler that is both for young and older generation, one that suits boys and girls in the 'Y' shaped peeler style, should be easy to use in the right or left hand , should be made from plastic and maybe rubber. Shall be fairly easy to clean and be the same size of the hand for ease of use.

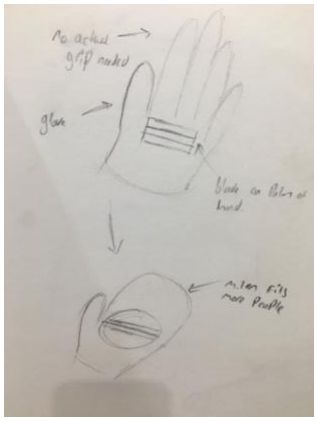
Design and development of the concept peelers

Firstly, I made two basic adaptations of typical peelers, this consisted of making the handles bigger/wider to improve grip. It also included a little zig zag design that made it less boring.

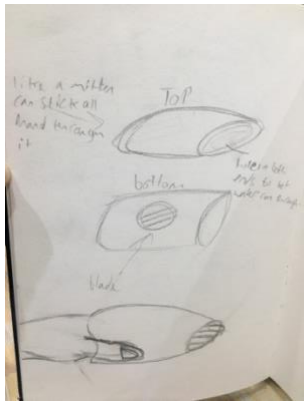
I then made a completely new concept design that I got inspiration from a turtle shell because I thought the bigger the peeler the better the grip. This design however was too bulky for my liking. It also looked too heavy and uncomfortable to hold.



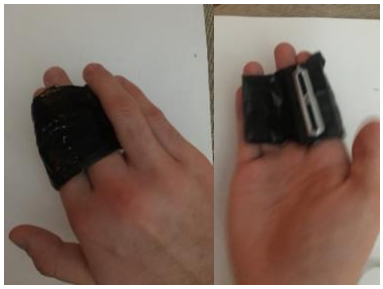
I then moved on to create a glove type design because that would be the most grip I could possibly have with the peeler. After looking at this design in more depth I realised that a glove would only fit certain people and wouldn't include a vast range of the target market.



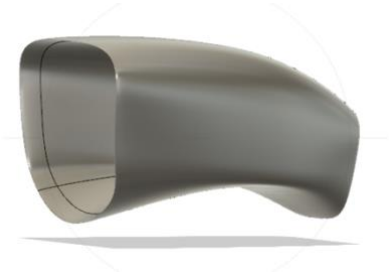
I still liked the glove type design, so I merged the idea with another one I had which is the turtle shell. This resulted in different versions of an empty shell that the hand slides into with the blade on the underneath. This is by far my favourite design that fits the brief as it is the same size as the hand, made from plastic and suitable for left and right-handed users.



I made my favourite design's into prototypes using zip ties and duct tape to produce a quick prototype.



This design was then put on fusion 360 so that I could get a better view of it in the 3d world. After making a few adaptations I 3D printed a model to see how It fitted in the hand.



Then I adapted the measurements based off the first 3d printed model to make the design smaller and compact and added a slot of the peeler to go. I also created a quick attachment so that I could test the peeling of it too.

I only 3d printed the concept ‘Type B’ Peeler in order to see what it would look like in PLA and how it would function. This version was never tested with the test group but was tested by me, I was very pleased with its function and form.

These are the final prototypes that will be used for the testing against the existing peelers they are made from zip ties and duct tape which aren’t pleasing materials, but the test group will be informed that these aren’t their final forms and that the products final material will in fact be plastic and rubber.

Concept ‘Type A’

Concept ‘Type B’

Reference list

- https://orthoinfo.aaos.org/en/diseases--conditions/arthritis-of-the-hand/
- https://www.activemobility.co.uk/good-grips-easy-peeler-p-1842.html?ref=32
- https://www.activemobility.co.uk/good-grips-peeler-p-1841.html?ref=32
- https://www.nhs.uk/conditions/arthritis/
- https://www.amazon.co.uk/s/ref=nb_sb_noss_2?url=search-alias%3Daps&field-keywords=vegatable+peelers
- https://www.ebay.co.uk/sch/i.html?_from=R40&_trksid=p2380057.m570.l1313.TR1.TRC0.A0.H0.Xvegetable+peelers.TRS0&_nkw=vegetable+peelers&_sacat=0