

DT Research

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Problem

I have noticed in many university common rooms and libraries that the common room or library may feel uncomfortable and unwelcoming to students. I plan to change that by creating a product which can provide comfort to the student. Another problem I noticed is the lack of relaxation and isolation (due to the noisy environment) that students gain in the common room. The project I have planned will remove that issue, students also wanted more space for their books or meals within their common rooms and libraries. I will also eliminate this issue by creating a product which allows more personal space between students who want a break from the hard study life. After researching many products within the market I am aiming for, I have also noticed that products lack storage areas which can be used by the manufacturer or the user. I plan to eliminate an issue such as this as well as the slight gap in the market of this feature.

Brief

I plan for my product to be furniture which suits the student lifestyle and requirements. The piece of furniture will be made using appropriate materials such as MDF as this is a material which is able to take mass amounts of weight and support the weight upon it. This would be due to students usually carrying a heavy load. Due to the students using food around my product, the armrests of my product should be made from a material such as vinyl which can be easily cleaned and maintained. I plan for my product to have a crown roof made from a suitable material such as acrylic, which isolates the user from noise and any distractions as well as allows them to concentrate. Another feature my product will contain is a tray where the user can place their books or food, they can put the tray away whenever they want to. From my perspective I found that students tend to find more satisfaction when using a piece of equipment/furniture which holds the name of their institution as they feel more part of a community.

Overview of the target use/user

The main focus of the target use is that students focus more and be able to find a place to relax. Majority of university students tend to spend most of their time in the library/study room in order to complete their work. The long study sessions tend to lead to fatigue and tiredness and students may need a quick nap. Furt

<u>The research I need to conduct</u>	<u>The reason that I need to conduct this research</u>	<u>The way I conduct the research</u>
<u>Environmental</u> - I would need to conduct research on environmental materials and also research how the materials I use can be recycled. I would also need to research the sources of my materials to ensure any hazards my product could hold are rid of.	The reason I need to conduct this research is due to the fact that if my product were to be sourced from a material which is bad for the environment. I would have to also check if my material were toxic as this would be unsafe for my client.	Once I have chosen the material to use in my product, I will have to check where the material is sourced from. As well as this, I will have to conduct a research on the advantages and disadvantages of the material I am using and make a judgement in terms of how safe the material is for my product's usage.
<u>Situation Analysis</u> - Situation analysis allows me to understand the extent of size I can take my product to. It will also allow me to trial and error with my products.	The reason I will need to conduct this research would be due to the fact that the product would become more suited to the situation which then attracts my client towards my product more.	After conducting the research of my situation, I will need to find clients who are within that situation and conduct interviews to get a better understanding of how my product will suit this situation.
<u>Target Market</u> - Market research would also be needed to show me my options within the market and if I could fit the design more to fit the user needs.	The reason I will need to conduct this research would be that it would enable me to appeal my product all around and not just in one sector to fit the overall needs of the client.	Target market research can be conducted by finding a gap within the market and tending towards those needs.
<u>Material Research</u> - Researching the different types of materials would tell me what material are best suitable for my product.	Researching the material used in my product will allow me to test the best material for my product and how much mass the material can take as well as the lifespan of the chosen material.	Material research would be conducted by testing samples of different material against the function of your product.
<u>Market Research</u> - Researching the market would tell me the best market to suit my product to and I can further develop to suit this market.	The research of the market would allow me to make my product more relatable and more appealing to the market and I can also determine the gaps within the market to make my product more unique.	Market research can be conducted by determining the needs a market would need and trying to create a product which has not been seen much.

Cost

The cost of my product will be ranging from £120-160 due to the different functions it will have. The cost of my materials and manufacturing would be around £40 to make the entire product. This is due to the wood materials being cheap as well as the processes used to manufacture my product.

Research

For my research I would need to study my client (the university) and my user(the students) into their lifestyle and theme in order to implement this style into my product. I would have to study the different types of furniture in university study rooms to understand how I can make my product to have that style. I would also need to research the different materials used in modern furniture products in order to gain an understanding as to which is the most suitable.

Process

The process required for my product would be appealed towards manipulating the shape of the product in order for it to fit the design I am aiming for. The process would have to include sanding in order for my product to reach an intricate curve and bend for a user to sit comfortably in. I would also have to include heat processes in order for the plastic in my product to be changed and moulded. What would also need to be considered is the way my product is cut. Due to the product involving wood, there would need to be supervised use of machinery to achieve a certain shape.

Client & Target User

My client is a university, as they have a lack of comfortable and practical furniture which appeals to their students. This is due to the university requiring a large sum of furniture in order for the students to relax and focus in their studies. In order to progress, the client would need a product which provides comfort to the user whilst conducting long periods of study as well as allowing to take rests during breaks.

Ergonomics

Anthropometrics is a key feature that would be taken into consideration when designing my product. This is because the primary purpose is for the university students to be able to study in a focused fashion. I will design my product ergonomically to fit the needs of the population students who fall into the 95% percentile in both genders.

Aesthetics

Light, neutral, relaxing, pastels - Colours that are light and neutral would make my product aesthetically pleasing and attractive. Neutral colours will also make the appealing to the eye whilst the client is using the product. A soft material should also be included as this will provide comfort to my user as well as initiates a sense of focus. An enclosed product will fit the function of my product as this will make the student feel focused and will keep a calm environment. An example of this would be the colour scheme my product would have to suit would make the cost expensive as it requires more labour.

Function

The function of my product would be to work as a chair which is comforting to my user as well as encouraging productivity in work with my user. The features within my product should also encourage more ease of access with the items the user is carrying. The product should also be able to incorporate forms of storage for the user as well as for the environment it is intended for.



Product

The product will likely to be used for long study sessions and will provide comfort to the user if they needed to relax for a short period of time. The aesthetics of my product will give a comforting and warm feel in order to comfort my user as well be appealing to the eye when deciding where to study within the area of where my product will be. I would also have to implement other features into my product which makes it multifunctional. These features would need to be ergonomically designed to fit the ergonomics of the general population of students within the age range of 18-22.

Materials

Suitable materials for my product could be materials such as MDF. This would be suitable as it is non toxic as well as an appropriate base material. The materials used will have to be able to take a great amount of tension as the function of my product will be sitting in it, possibly for a while. If the material is too weak, it could potentially snap and could injure my user.

Another potential risk of the material I use would be that it can be uncomfortable for my user. For example, leather gets sticky in summer. If the wood for my arm rests are not correctly sanded and treated, then there could be sharp edges which potentially harm my user.

User Interview

My chosen user will be the university students.

1. What features would you wish to see in our style of a standard chair? As a student who is constantly in the study due to the heavy workload we receive, I have had my views and perspective on the furniture that is provided. I highly agree that the furniture is only comfortable for a while but then tends to become uncomfortable and does not provide comfort for long periods of study.
2. How often do you go into the study room? I tend to visit the study around 3 days of the week and when I do go, it tends to be for a long period of time; roughly 3-4 hours and 4-5 hours during exam season.
3. Do you feel hungry when studying? I often bring snacks with me to the study as it saves me visiting the university canteen which does also waste time. However, I do eventually become desperate for food and it affects my study as I do not actually have anywhere to place my food.
4. Are you permitted to eat in the study? The study area has strict rules to food which is dry and makes less noise as this keeps the general low noise environment of the study intact. I bring healthy snacks and drinks which is easy to clean up and would not stain furniture.
5. Do you feel like you have enough time to be napping during long study sessions? When exam/deadline season comes by, there are many students who revise and work till very late. There are some students who rest during extremely long periods of study such as me. A product with a comfort like that would help.
6. What colour scheme would you feel is appropriate for a furniture product such as our standard chair? I feel that the best product colour scheme would be warm colours which fit our theme as this fits the feel of the study and blends in.
7. What type of materials would you feel are appropriate for a study chair? I would choose materials which are breathable as well as comfortable for users like us. The stuffing for the material should not be too comfortable as I feel this would discourage a work motif.
8. Would an overhead crown be useful for a study chair in order to block out the noise? An overhead crown would efficiently drown out noise and my eyes and would be very helpful. I would however prefer a crown which is mildly transparent so I have light reaching my study area.
9. What would you consider an ideal size for a study chair to be able to fit comfortably in your study room? I would consider the size which can fit in a measurement such as a cubic square metre of the study so there is room for more of the products and there is not much space taken up by whoever is using it. The product should follow suit with the current furniture we have in terms of size.

Client Interview

My chosen client will be the university.

1. Would you consider your students focused when in the study room? I would see my students as focused when deadlines are due however quite laid back during free study sessions and not in exam season. Students do however get distracted when in groups and not studying independently which affects the overall environment of the study.
2. What features do you find most useful in a product in order to help your students? The features I find most useful are ones that encourage studying. This includes features such as a built in desk or a pull out desk which is a reasonable size enough to place notes and books. I'd also like to see a feature which encourages my students to study independently and also reduces the noise level reaching those studying independently.
3. What would be your opinion on your furniture and is it comfortable for your students? I'd say that the furniture is reasonable enough for students to study effectively with enough comfort however, it is agreed that the current furniture is relatively uncomfortable and needs improvement.
4. Do you agree that students have long lasting study sessions due to the heavy workload? The study sessions for independently studying students usually last roughly 2-3 hours whereas grouped study sessions lead to procrastination and lasts around 4 hours. I aim to maintain a balance with grouped and independent study to allow more students to enter the study and revise or silently relax if needed.
5. What type of furniture would you recommend for us to compose that you lack in currently and if so what style? As mentioned earlier, there is a lack of encouragement for independent study which is needed in order for students to focus properly.
6. What styles would you consider appropriate for your study room? I would consider colours which are not too bright and eye catching as this may bring too much attention to the product. I would suggest colours which are mainly primary and secondary as well as dull due to this allowing a warm aesthetic towards the product.
7. Do you allow food into your study and if so, would you buy a product which eases food consumption? I allow food which is mainly dry such as snacks as this makes less mess and I also trust the students to respect the study and pick up after themselves as well as not make any mess.
8. How often do the students use the library? The students tend to come in during opening hours along with the extremely busy students working during unsupervised hours so the library/study area is constantly in use and is busy at all times. I also tend to see students finding the furniture for relaxation when resting during study.

Client Visit



The images shown above are of products I looked at during my product visit. What these furniture products mainly show is the types of design which is used in university and study room areas;

Product Analysis

What are the most prominent features?

This product clearly shows a feature which stands out and makes the product also look very modern and suited to modern society. This feature would be the extendable arm located on the side of the product. This attribute would allow more ease for the user in terms of placing items of use or leisure. An advantage of this feature would be that it is easy to access and extendable therefore more useful as well as convenient for the user. However, a disadvantage of this feature would be that it is quite high which would make it uncomfortable to the user. As well as this, the extendable arm can not hold much weight.



What are the most prominent functions?

This product has many functions which are useful and beneficial towards the user. The chair follows the idea of isolation and reducing noise pollution as clearly seen in the image. The function would be described through the form of the product. The geometric shell with thick material upholstery would cancel out any distractions from reaching the user as well as allows the user to focus independently. Another function that can be spotted within the product is to comfort the user. The material used is seen to be a fabric mesh which aids the user in terms of body temperature and comfortability. The product seems follows suit of being used for long period of times which would lead to the user becoming sweaty and eventually uncomfortable. This fabric mesh allows ventilation and air circulation to take place therefore regulating the temperature of the user as well as comforting them.

How is the product suited to my intended environment?

The product shown is suited to my environment as it follows the geometric style and form that a university study room would follow with their furniture. The mesh material used is dominant in majority of university studies as they are temperature controlled and does not stay heated for the next user/student . The product in terms of aesthetics is very plain and suits an office/study environment. The black and white colours are not too eye catching as this can discomfort the user. As well as this the material is not too rough as this may become uncomfortable to the user. Overall, the product is suited well to a study environment as it encourages focus and drowns out noise.

Product Analysis

What are the most prominent features?

The product displayed here shows many features which prove valuable to the audience and environment I am aiming towards. The product would suit a university study as it contains a valuable feature which is the extendable study table which aids the user. The feature is convenient as well as useful as it can hold a reasonable amount of weight. This is suited towards the user as study books or laptops tend to be heavy which would be held easily by a feature such as this. Another feature which is clearly seen would be the 360 swivel wheels feature located at the bottom of the chair. This tends to prove useful as it allows users to move around easily as well as reduces the stress and hassle of placing the product in a specific area. Another feature which is clearly seen are the curved armrests located on each side. The feature would prove viable as it provides comfort to the user and allows an enclosed personal space for the user. This is suited towards the user as it encourages personal space as well as promotes comfortability for the user.

What would you infer the functions are of this product?

The main function of this product would be to provide comfort to the user. This is due to the materials used and the all around ergonomics being tailored towards the intended user as well as fitting their purpose. For example, the leather upholstery is of convenience as the material is able to stretch and comfort the user under tension. Another function of this product would be to allow users to place their books/food somewhere which is easily accessible. This aids the user as they would most likely not like to hold items in their lap or have to place them on the floor. The rotation mechanism implemented with the table is also beneficial as users can move the table away for more space at any time.



How is the product suited towards my intended environment?

The product fits the environment through its size and function. The size easily fits into a student common room as well as allows more space between students in order for them to study or relax. The colour scheme also shows that institutions can follow suit with a plain colour of their choice which also correlates with the theme of the university. The materials used are also leather which is easy to clean in a busy and messy student environment. Another way this product is suited towards my environment would be the implemented features such as the wheels. This feature encourages mobility in an environment where many users tend to move around in order to find a better area of comfort.

Specification

Specification Point	Justification	Further Justification
Style - The style of the product would be simplistic to give a warm look as well as not bright enough to distract the users focus. This would be colours involved which are primary and secondary as these are not too complex as well as bright to my intended users.	Style - The main reason for this style would be referring to the client interview where it was specified to implement a style which was ' not too bright and eye catching '.	Style - Conducting further research on student behaviour, what could be inferred was students found colours which were suited towards the theme and environment were found more attractive which encourages use of the product.
Materials - The materials used should aim to be environmentally friendly as well as user friendly. This encourages attraction to my product market wise as well as implements a sense of comfort in the product.	Materials - The reasoning for this would be that the user interview specifies issues with being in the study for a long period of time which leads to naps. Comforting materials support issues such as this.	Materials - Further research allowed me to understand what types of materials should be aimed for and also understand the times students spend whilst studying which allows me to guide my design towards that.
Function - The function of the product is to comfort users while studying whilst also aiding them in terms of convenience and relaxation.	Function - The product should follow the client & user interview where it was discussed that features should encourage independent study.	Function - With further look into my brief and problem I discovered the issues which students face whilst studying which allows me to implement functions which eradicate issues as such. (e.g. noisy environment leading to distraction)

Specification Point	Justification	Further Justification
<p>Environment - My product should aim to use sustainable materials which can be easily recycled. The plastics used for my product would be the only material which is not environmentally friendly however my product should aim to use eco-plastics. The variation of plastics should be thermoplastics as these are reusable to an extent.</p>	<p>Environment - The reasons as to why my product should aim for sustainable materials is due to the fact that more clients become attracted to materials which are able to be easily recycled if my product were to become damaged and unusable.</p>	<p>Environment - The reasons as to why the product should aim to use thermoplastics is due to the fact that these types of plastics are reusable and can be reformed with heat. This establishes a good reputation of my product to my clients. As well as this, if the plastic used in the product were to become damaged, the plastic can easily be reformed for another purpose.</p>
<p>Size - The product should aim to be roughly a metre tall as majority of furniture products are built towards these size. The size must also be ergonomically sized to fit users who are abnormally heavy as well as those who are shorter.</p>	<p>Size - When researching and looking at other furniture products, I understood that products relatively close to my design were built towards this measure. This allowed me to understand the different factors I would have to consider when prototyping my design.</p>	<p>Size - As stated in my research, my client discussed that the features of my product should also be a reasonable enough size in order for books and snacks to be placed as the product should also aim for ease of access for users. The product should aim to also implement features with size as such.</p>
<p>Safety - The product should aim to be as safe as possible. This is mainly due to the fact that the product is going to be sold to institutions which have guidelines to safety. Implementing safety symbols as well as material symbols will be able to guide my client and user on what to do around the product as well as what not to use near the product. The product's design should also steer clear of rough wood or edges to ensure there are no injuries from my product as well as allowing comfortability.</p>	<p>Safety - After researching materials I plan to use for my product, using materials such as Acrylic or PVC would require me to implement symbols such as the Mobius Loop. Using this ensures my client would understand how to recycle my product or whether or not it can be recycled.</p>	<p>Safety - As discussed in my interview, the client wanted a product which provides comfort towards the user. Using materials which are smoothed or sanded down would make my materials less rough which aids the comfort of the user sitting or resting on the surface.</p>

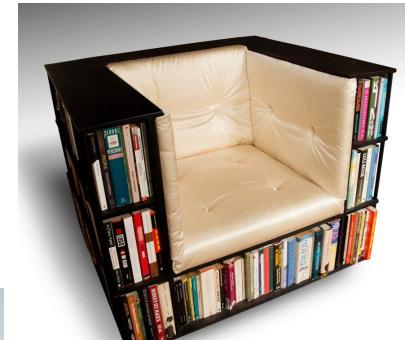
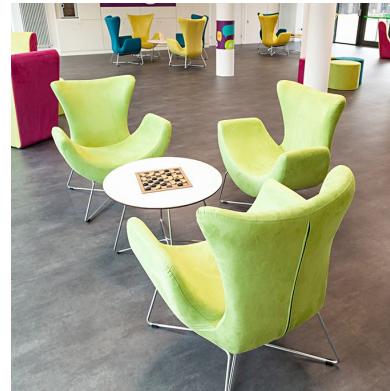
Market Research

Existing Ideas within the Market:

What can be inferred from these existing products is that most product designers lack innovativeness when it comes to the field of study chairs. There is a gap in the market which does not include furniture products which are multi-functional as they mainly follow function majorly over form. From these products I can also infer the drastic anomalies in terms of ergonomics which does not consider the above or below average percentile measurement. Material wise, most of these products consist of plastic. Plastic is seen as a non environmentally friendly material which would be seen as a disadvantage in terms of attracting clients as well as users. One feature of these products that could be focused on would be that the maneuverable table feature built into the products are too small for items to easily be placed and for users to rest on. This is also seen as a disadvantage of the product. Furthermore, the products follow a very basic colour scheme which makes the product overall look very unappealing and not eye catching enough.

Possible Features which I could implement:

From what I can infer after researching existing products, there is a major gap in products with an innovative design which also uses materials other than plastic. My product should aim to use environmentally friendly materials or recyclable materials. This would be materials such as wood which can be easily recycled for other purposes. Another feature I could include into my design would be storage compartments as this is what most products are following as a form of modern design. I would implement ergonomically designed storage on a larger scale to allow more ease and comfort with using my product. Another feature which should be considered is colour schemes. The colour scheme of the product could potentially be themed to allow users to recognise their own institutional product or the colour scheme could be chosen and customised by the client. This gains more attraction as clients appeal to being able to create their own product to an extent. Another feature which should be considered is implementing maneuverable tables which allow better ease of access for the user in terms of placing food or books in an area which is within reach. What was also noticed was the pricing. Products on the market sell for £250 per unit for a product environment such as mine. My product should roughly aim for a price range higher than this mainly dependent on the features and factors of the furniture considered.



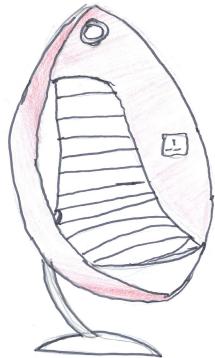
Anthropometric & Ergonomic Research

Majority of products that are suited towards the environment that I am aiming for, tend to be of strong weight. However, my product will have to be sized and designed towards modern measurements and the average user to ensure there are no issues. According to a study by ResearchGate, the average male user aged 18-25 weighed around 71.3kg and the average female user aged 18-25 weighed 58.5kg. Using materials such as MDF or plywood would be suitable as they are considered durable strong woods. MDF being an engineered wood with fibers and resin to create a strong material would be able to uphold weight such as the average user and the upper percentile. Using plywood would also be suitable due to the fact that the material is layered, meaning the strength of the material is high. Applying weight to any of these materials would not be seen as an issue as my product would then be able to withstand roughly 200kg. This would also be due to my design having an intricate look which makes my product potentially susceptible to breakages or becoming damaged.

What will also need to be considered is the sizing of the product. According to a study by ResearchGate, the average male user aged 18-25 stands at a height of 68 inches (173cm/5ft 8"). The average female user aged 18-25 stands at a height of 62 inches (158cm/5ft 2"). I would also have to consider the average user and upper percentile of users when designing my product as this mainly factors in comfortability. For example, creating a maneuverable table or designing a feature which may lead to the user having to reach towards it would have to be considered in terms of ease of access. What should also be considered is following modern furniture design in terms of measurements. Majority of products are sized in ranges of 32-43cm. I would have to aim for this margin of size with my product as this would follow modern anthropometrics too. What I also plan to implement into my design is a curved backrest. What would need to be considered is the curvature of the backrest as this would disrupt comfort if it is too curved or not curved enough. Most lounge chairs follow a 25 degree angle however due to my curvature I would need roughly lower than this. Using materials as flexi-ply for my curved backrest would be suitable as it can be bent and shaped to factor ergonomics without snapping or becoming damaged. As flexi-ply is a weak material, I would need to implement forms of support within the product to prevent the material from snapping.

Initial Ideas

The light feature for my design was seen as useful. This is mainly targeting the issue discussed in my situation brief where my user discussed that they often spend time in the night especially revising in order to complete their work. The light is mainly suited towards visibility and sight issues.



The upholstery design was seen as a more modernised design as well as comfortable for the user. This upholstery was seen as ergonomically unsuitable as it was too tight for students who are seen as large for a chair upholster as such.

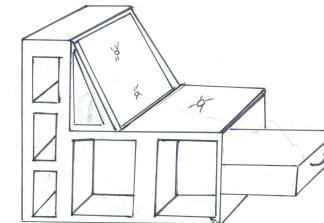
The way that I could improve this design is by implementing more open space into the inner area to factor in users who may be than the average percentile in terms of height and weight. This would attract more users to the product.

The base chosen for my concept was seen as modern yet ergonomically impractical. This is due to the fact that the stand for the base would only be able to support a light weight on it.

From previous research, I understood that students relied on devices such as laptops and smartphones which require a charger. Implementing a plug socket into my product was seen as beneficial to the user as well as convenient.

In this design idea, I decided to implement more storage function into the design as this is also an issue within my brief and problem. The aesthetics of this design follows more on modern and eye catching furniture designs we see in most products of today. What makes this design unique is that many designers tend to follow a very basic design which implements a very straight forward function. I wanted a product which is multi-function.

The upholstery design for this design idea follows a more traditional and recognisable design as this is more eye catching towards my user.



The shape of this design was seen as very basic but follows the sizing we see in most university studies today. The shape is slanted to allow the user to essentially rest their back whilst studying. This feature refers to my design brief where I discussed that users may want to fall asleep during long study sessions.

The implementation of storage space and bookspace relates to my brief and problem where it was discussed that many students fail to find areas to place their books without affecting other student workspace.

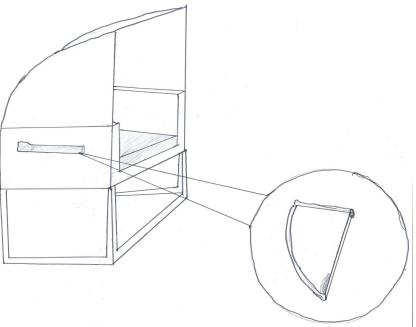
The addition of the draw feature allows more cushioning to be stored if the user required more. This overall improves the comfort of my product as the comfort can be increased.

Initial Ideas

This initial idea mainly focuses on the idea of noise pollution within study areas. The overhead crown feature of this design is what essentially drowns out noise and also contributes to students who would want to sleep during long study sessions.

This relates to what was discussed in my problem where students failed to study for long periods of time without a nap.

The form of this design idea mainly follows what is seen in majority of study furniture in terms of size. This allows the client to be satisfied with the area for the product to be placed in the study.

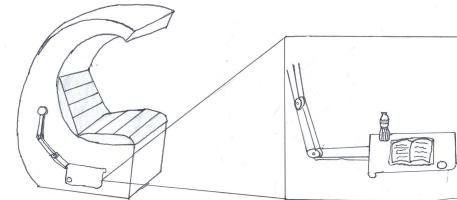


The pull out table feature relates to the ease of access issue as well as allows more space on the product. Users can place items aside such as food and drink without the worry of it being knocked over compared to being near their feet. The table includes an ergonomic handle/groove which allows the user to easily grip and move the table in and out of the aperture.

The chair support legs shown in this design are modernly designed as this is what clients are demanding more due to ergonomics and appeal to users. The open area between the legs allows users to perhaps run cable wires from underneath the chair to prevent obstructing walkways. As well as this, the legs are a more cheaper alternative material wise as well as environmentally wise as there is less material to recycle as well as use.

This initial idea follows fairly the same design idea as the over head crown idea. However, the design follows closer to the function of the furniture as discussed in my specification. The overhang cover features a light installed which essentially works as a substitute for natural light due to the cover blocking this.

The shape of this design is seen as very unique and not seen in majority of furniture products that are seen today. The design follows a modern and more intuitive design which focus on the aesthetic of my product along with the function. This eye catching design attracts more users to my product especially with the target audience this product is suited towards.



The upholstery design for this idea is seen as the most suitable in terms of comfort. The grooves in between the cushion are seen as more durable as well as follow modern upholstery which would make my product more appealing as well as comforting.

The arm built into the side of the product is extendable as well as maneuverable. This feature is seen as useful as it allows users to move their items around as well as place items in an area of access as well as in sight. This directly relates to ease of access as discussed in my situation.

Foam Board Models



The seating area of this design now includes a flat seating area with a curved backrest. This suits the base as well as the gradient of the chair. The chair is fairly slanted so the user would slant whilst using the chair. This relates to my situation where students wanted a product which could allow them to rest during long study periods. This would benefit the product as more users would be attracted to it.

After making some adjustments to the design, my pod initial idea was developed into a foam board model. As shown in the image, the design has been made larger and wider in consideration of being ergonomically designed. With this model, it was also decided that the design should include arm rests. This is mainly due to the fact that majority of furniture designs and products implement a form of armrests. Implementing armrests into my product would also attract the average user in terms of market research. After studying what products would use this type of feature, my product would gain more attention from this feature.

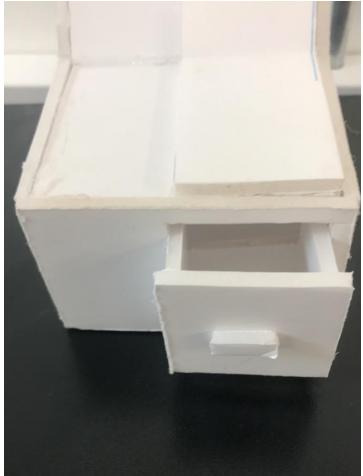
What I also noticed I can improve with this model in my stage is factoring in anthropometrics. For prototyping example, I noticed users would be unable to sit comfortably due to the arc of the backrest being so curved that it could potentially cause back issues.

The improvements I could make to this design is include a storage feature or ease of access feature. This could be a draw or area where users are able to place their items to prevent them getting in the way of passersby. Another improvement I could potentially make is a base which has a wider surface area. This would allow weight to be distributed more efficiently instead of applying weight on one point

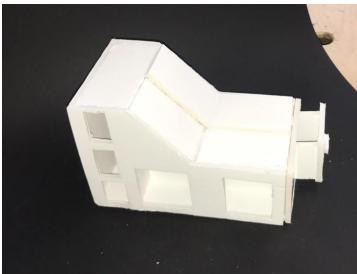
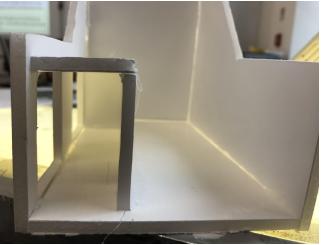


As shown in this image, the grooves cut into the back of the chair allowed me to visualise the curved pod design I was aiming for. The technique was achieved using a scalpel. The base for the design was slightly altered from a circular base to a square base as this covered a more balanced surface area as well as suited the new design I created. The two sides of the chair were symmetrically cut out. These sides were then aligned according to the curve I was attempting to achieve and glued using the hot glue gun. This allowed me to also maneuver the shape of the prototype whilst the glue was drying.

Foam Board Models



This foam board model is an improvement and development of my initial idea which decided to implement storage space and essentially aid the user in terms of removing items out of their way. The model has been slightly altered from the original design. In this model, the chair was extended to allow table area when users are requiring an area to place snacks or their laptops. This feature was mainly related to my brief which discussed students not being able to place food/items in an area of easy access. In order to differentiate the seating area and the table area, I raised the seat to keep the user elevated and at a comforting level. However, there could be improvements made. For example, adding in a form of grip for the seating could be implemented as users may need something to hold onto when imbalanced or as they're sitting down onto the product.



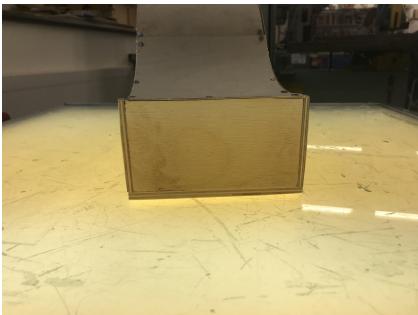
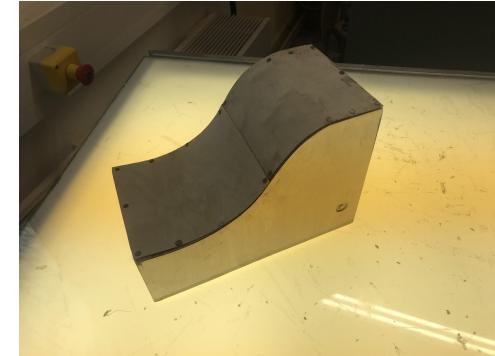
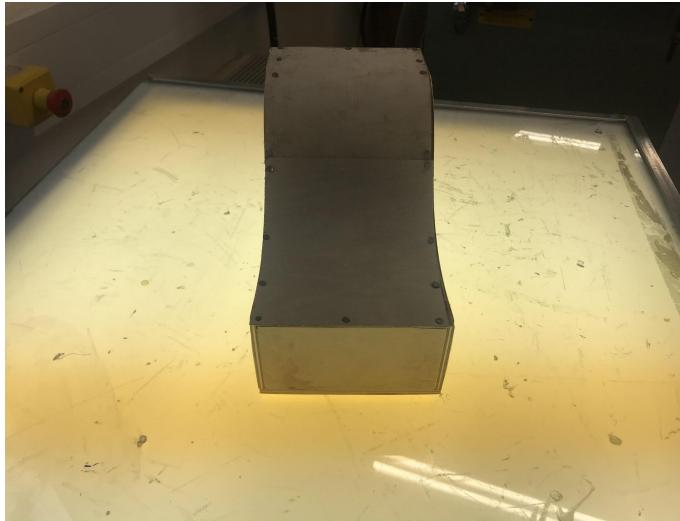
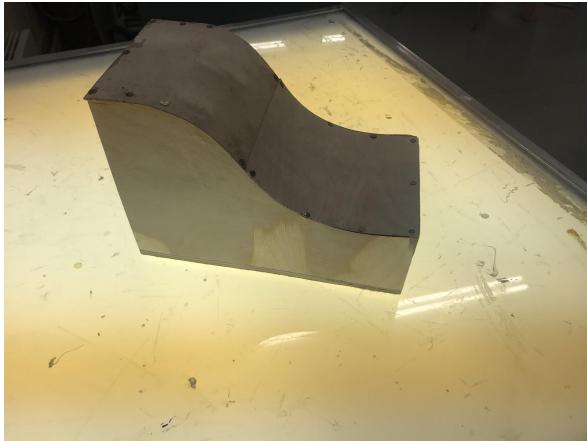
For this model, I also decided to implement a small draw at the front of the product. This draw could potentially hold extra cushioning for the furniture as the user may decide they feel uncomfortable and require more cushioning. The shelving units on the side are mainly for storing books issued by the client as this promotes reading and studying within the intended environment. There are improvements that I can make to this design however. For example, the seating area of the chair could be curved more in order to comfort the user more. This is due to considerations after ergonomic and anthropometric research, users tend to feel more comfortable with a curved backrest rather than a straight angled backrest. Another improvement could be implementing a source of power to charge the user's devices rather than having to find an extension cord to reach the chair. This would encourage organisation and cleanliness within my design which would attract clients towards my final product.

Upholstery Designing & Testing

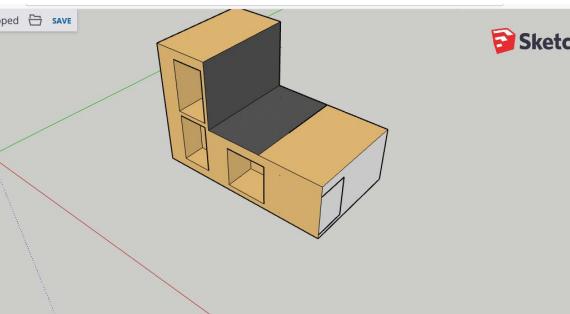


After modelling and designing my product ideas, I decided to further my research in upholstery and began to experiment with how upholstery works. As shown in the images, I used a thin block of MDF wood as this is a material widely used for upholstery support. The MDF block was cut, filed and sanded down to a square which looked similar to what furniture product sizes are used for MDF. This was done on a smaller scale to prevent materials being wasted in the process of experimenting with upholstery. After completing this task, I used upholstery foam and began testing the different amounts of foam required in order to comfort the user. What was also considered during the testing stage, was the material used for the upholstery. The material was a silky fabric which was seen as comfortable. After feedback from users, a mesh type fabric would allow better air circulation as well as ventilation to reduce sweating and discomfort. I tested twice for cushioning and also on the second test, used glue to secure the foam in place. The material was stapled down using a staple gun whilst using a specific folding pattern to allow a tight wrap around the cushion and not expose any areas of the MDF. In terms of improving for my final design, the upholstery foam could be changed to a different type which is not so free. I would prefer a foam type which can be cut to a specific shape and size whilst also being of comfort to the user. Another improvement as mentioned earlier, the material could be more a mesh material which allows ventilation to ensure the user does not sweat or feel discomfort during their usage of the product.

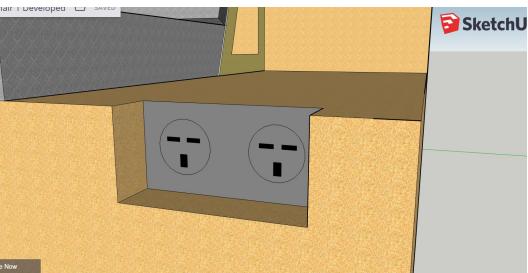
Wooden Development Models



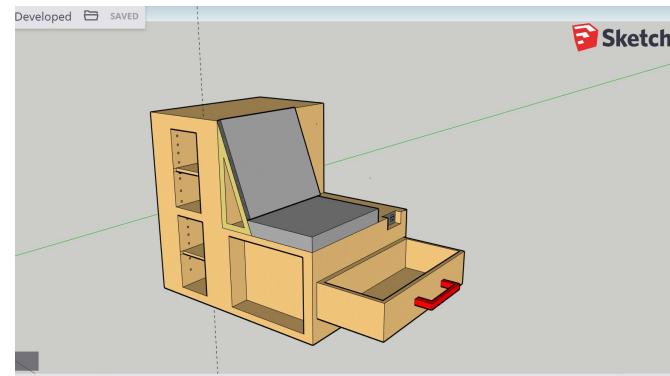
Google Sketchup Models



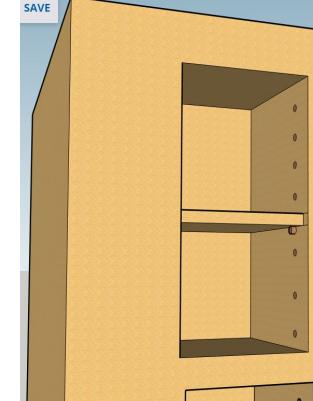
As shown in my foam board idea, the extended width of the product allows me to implement a table area where users are able to place their items or laptops with ease. What I also decided to implement was a recess where plugs are. This incorporates my improvement mentioning a power source due to many users using devices on furniture like my design. This would also aid in bridging the gap in the market where products do not have a feature such as this.



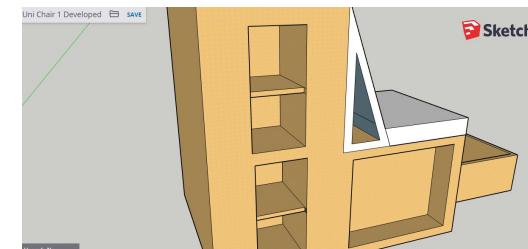
With this model, I decided to continue my development design of the lounge chair idea. Using google sketchup to prototype the idea allowed me to experiment with the model and make changes easily. To start off the design, I had a base model which I created to initiate a starting point where I could design from. The base model I noticed was too far stretched out in terms of seating. This did not factor ergonomics therefore I decided to shorten the length of the seat. This allowed space for more features to be implemented. However, after studying the seat design, I could potentially implicate a curved seat design for this model in development.



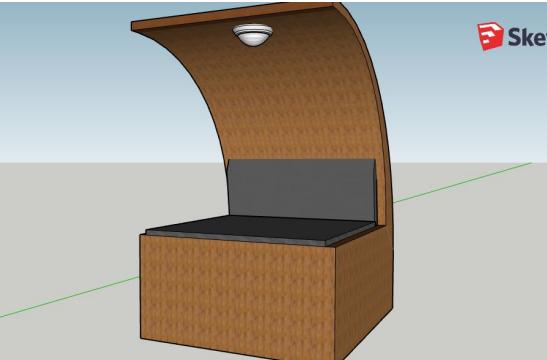
What I also factored in from my foam board idea was the draw feature. This incorporates what I stated in my design brief with a product which encourages storage space and cleanliness. What I decided could potentially be incorporated is the idea of extra cushioning in the draw. This would be providing more comfort for my user and overall attracting more clients and users to my product. What I also introduced with this model was a bookspace area placed behind the seat as this suits my product environment.



With this area of the design, I decided in order to encourage book space in a product built into a library area was implement shelves. With this shelf design I followed a design scheme which allows the client to decide where the shelving can be placed with wooden rivets and grooves within the shelving board. This allows the user to create different shelf designs and storage functions within the product tailored to themselves. This is seen as encouraging DIY and also attracting more customers in the market with this feature.



Google Sketchup Models

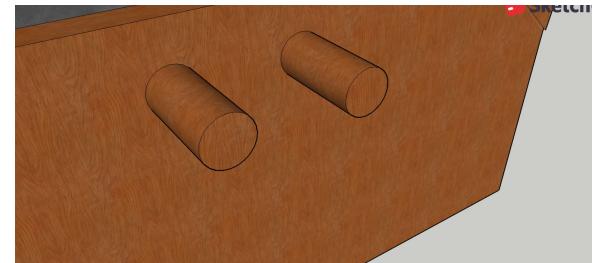


One other feature I included with this product was hooks placed on the side of the product. This feature encourages cleanliness which is also a client demand. The idea of hooks allows users to hang their laptop bag or school bag with ease instead of placing it on the floor in the way of others. What I could improve to this feature is perhaps implement storage space instead of hooks to allow users to place other items rather than just their bags.

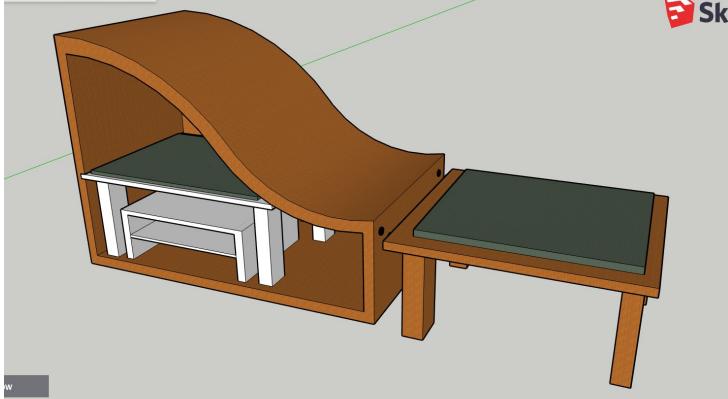
With this Sketchup model, I followed a more unique design which is rarely seen in modern products of today. What I aimed to create was a study chair which encourages reduction of noise in a busy study environment. This idea was incorporated through my overhead cover feature. This feature would isolate the user but not completely as they are still able to see their surroundings. The introduction of the overhead cover allowed me to create a solution of light being reduced. This lead to me implementing a study light into the design which also fits my brief in terms of users wanting to read during late night study sessions. However I did notice the seating of the design is fairly uncomfortable and does not show that I am factoring anthropometrics into my design. What I could improve to this design is allow a curved seat instead of square seating as this would be more logical as well as comfortable for the user. What I also followed with this design is a geometric shape. Majority of modern products follow this type of design and this would therefore gain more attention in the market. I decided however to not make this design my final design due to the basic form and function that the product has, this would not be beneficial in terms of marketing towards my intended audience as well as meeting client needs.



The pull out draw table relates to my brief where I discussed an area for students to place their food items or devices with ease and not having to place them in front of the chair or in the way of people passing by in a busy student environment. The addition of a plug recess into the draw also allows users to charge or power their devices which would be tending to user needs.



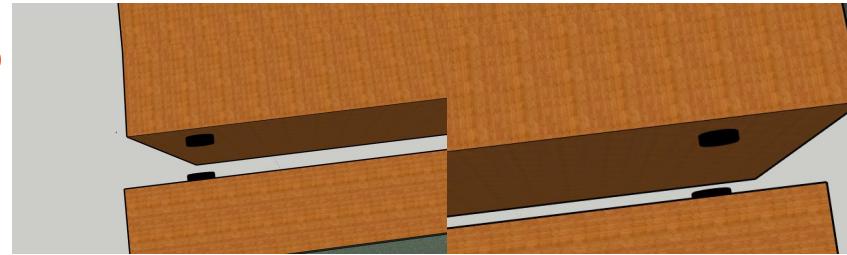
Google Sketchup Models



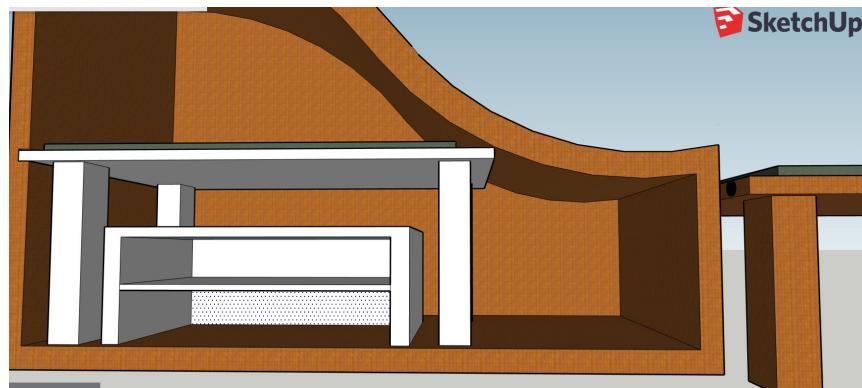
The bookshelf feature would be useful as it also encourages reading for users. This would be meeting my client requirements which is encouraging a study environment for users within the product and also ensuring that users will focus. The use of a shelf divide allows more books to be stored which would also be meeting client requirements. The placement of the bookshelf is at an area which would be seen as convenient in terms of space as well as also an effective use of space to implement new features.

For my final model, I decided to go for a different approach on the design of the product. This would be by implementing a curved backrest rather than a straight backrest. With modern day design, this type of backrest is hardly seen and I thought it would be right to implement. What was seen as an issue with this type of backrest was that the user's legs would hang off the chair in an uncomfortable position.

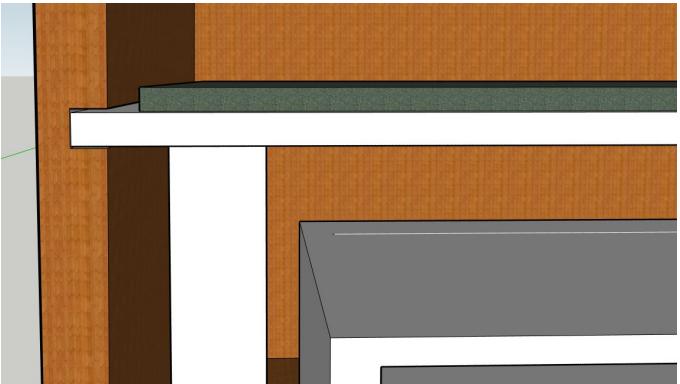
To create a product which fits the environment I am aiming for, this feature was seen as useful. This would be implementing a storage feature mainly for books.



This is where I implemented a feature which would solve this issue and keep the user in comfort. What was created is a footrest/workspace area which can be used to comfort the user's leg when needed. The footrest feature has cushioning with upholstery to provide comfort to the user when they are resting their feet. The feature is fitted with magnets to secure the footrest to the end of the chair to prevent it from moving.

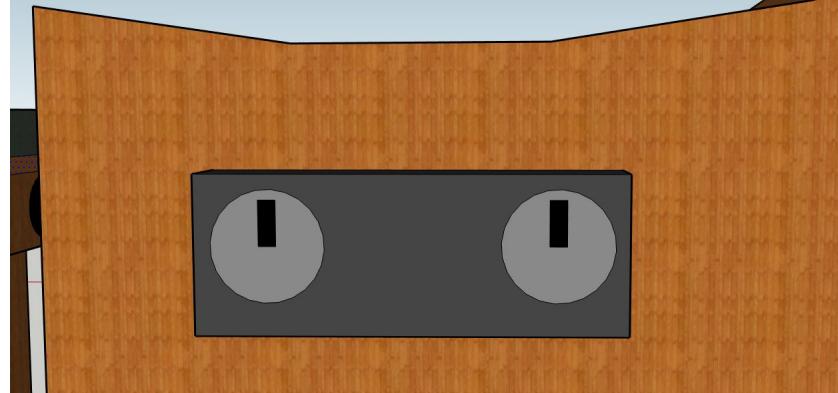


Google Sketchup Models

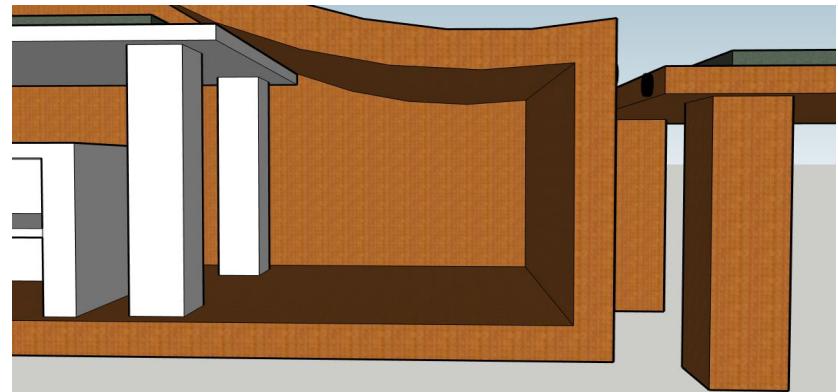


What was also implemented was an extra area of free space at the front end of the chair. This area is mainly for students to store their bag or any objects which may obstruct any passerbys. This is meeting the client requirement which mentioned that the product would have an area of storage which would benefit the user as well as the surrounding environment. The extra area within the product can also be used by the client to create their own area in the product if need be.

With the implementation of a feature such as the footrest, an effective method of storing the object would be needed whilst also keeping it securely in that position. What I implemented was a groove in between the wood which is roughly 9mm in thickness. This was mainly to fit the thickness size of plywood I am aiming to use for the top of the footrest. This groove aids in keeping the footrest in place. As well as this, the placement of this feature keeps the bookshelf in clear view for the users and encourages the idea of accessible storage space within my product. This would be meeting client requirements.

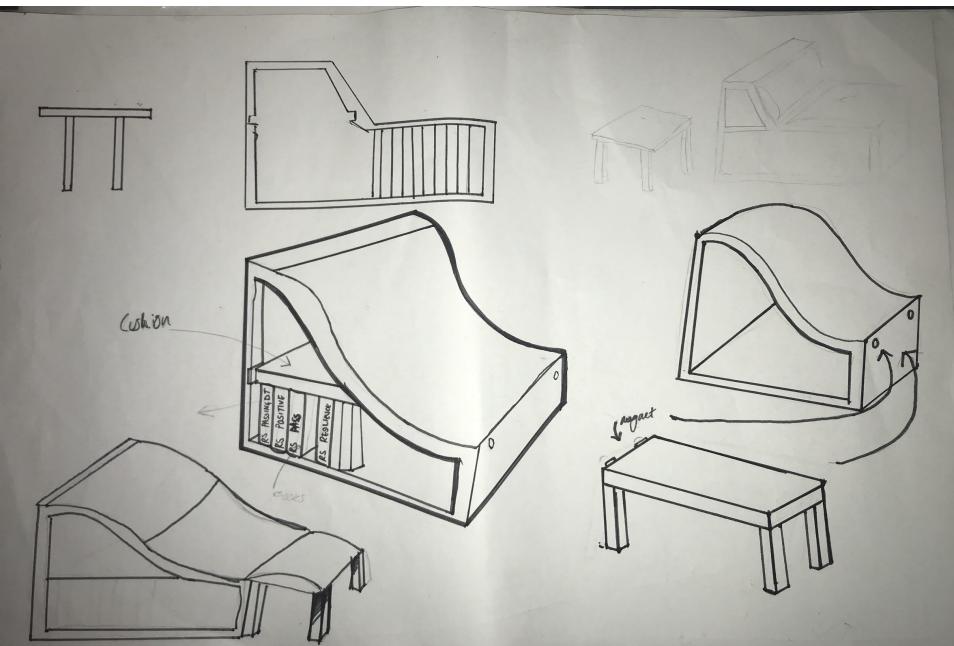
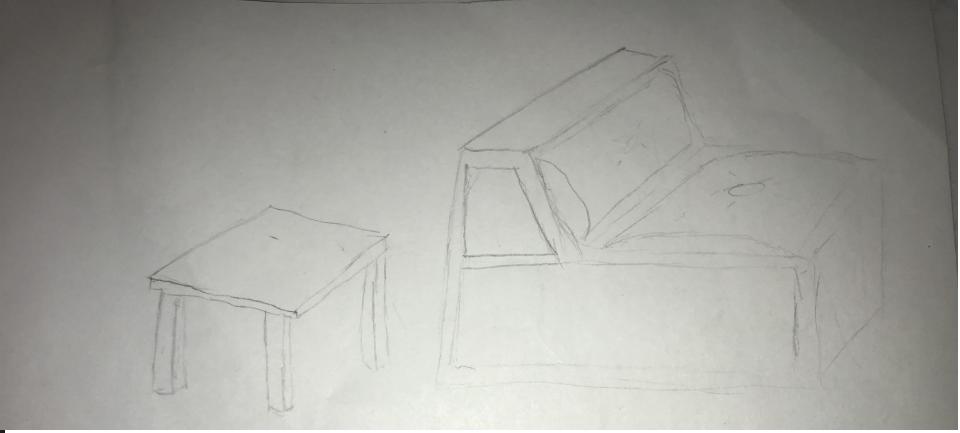


What I also noticed is that during my user interview, what was mentioned was a power source for users to have as they struggle to find power sources within their study area. I decided it was right to implement a power source into the left side area of the chair. This was also due to this area not being of much use hence why I decided it was right to add a new feature.



Final Design

In my final design, I decided to finalise what was created in my CAD stage of my product. The curved chair product which was also prototyped in real life seemed to be the suitable product of choice for my client. This would be mainly due to the fact the amount of key features which fit my client specification. The materials which I have chosen for this product



Cutting List

Part Name	Part Number	Material	Quantity	Length	Width	Thickness	Additional Details
Chair Back	1	Plywood	1	550 mm	457.5 mm	9mm	Indent must be chiseled
Chair Base	2	Plywood	1	900 mm	457.5 mm	9mm	
Back rest	3	Flexi Ply	1	130 mm	457.5 mm	3mm	Will be excess
Front End	4	Plywood	1	234 mm	457.5 mm	9mm	
Table top	5	Plywood	1	611 mm	438 mm	9mm	
Table Leg	6	Plywood	16	196mm	41mm	9mm	
Chair Side	7	Thin Ply	2				One side is laser cut with aperture

Cutting List

Part Name	Part Number	Material	Quantity	Length	Width	Thickness	Additional Details
Bookshelf side	8	Plywood	2	115mm	248mm	9mm	
Bookshelf top	9	Plywood	1	397mm	248mm	9mm	
Shelf divide	10	Plywood	1	351mm	204mm	9mm	