FINAL YEAR PROJECT REPORT

CHABLE

NAME:	NO. MATRIX:
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CIVIL ENGINEERING DEPARTMENT
POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

SESSION 1 2022/2023

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This report Submitted in Partial Full of Requirement for
The Diploma of Wood Based Technology in the Department Civil Engineering
Polytechnic Sultan Salahuddin Abdul Aziz Shah
SESSION 1 2022/2023

DECLARATION OF ORIGINAL AND OWNERSHIP

TITLE : CHABLE

SESSION : 1 2022/2023

We, **1. MUHAMMAD SYAFIQ BIN NADZRI (08DBK20F1001)**

2. MAWARDAH BINTI MUHAMMAD (08DBK20F1004)

3. MUHAMMAD HAFIZ BIN MUHAMMAD NAZRI LEONG (08DBK20F1005)

is a final year student of **Wood Based Technology Diploma, Civil Engineering Department, Sultan Salahuddin Abdul Aziz Shah Polytechnic**, whose address is **Persiaran Usahawan, 40150 Shah Alam, Selangor.**

2. We acknowledge that Chable and the intellectual property contained therein are our original creations without taking or copying any intellectual property from other parties.

3. We agree to release **Chable's** selection of intellectual property to the Sultan Salahuddin Abdul Aziz Shah Polytechnic to meet the requirements for the awarding of our Wood-Based Technology Diploma.

Made and truly acknowledged by the said:

1. MUHAMMAD SYAFIQ BIN NADZRI **…….**
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2. MAWARDAH BINTI MUHAMMAD **…….**
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3. MUHAMMAD HAFIZ BIN MUHAMMAD **…….**
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In front of me,

MUHAMMAD KAMAL ARIFFIN BIN HJ. BADRUN **……..**

as project supervisor on date : **…….**

APPROVAL SHEET

This Final Year Project Report entitled ‘ Chable ’ were submitted in fulfillment of requirements for the Diploma in Wood Based Technology.

Checked by :

Supervisor : MUHAMMAD KAMAL ARIFFIN BIN HJ. BADRUN

Signature :

Date :

Verified by :

Project Coordinator : ZULLHYZRIFEE ISHRAF BIN ZULKIFLY

Signature :

Date ;

ACKNOWLEDGEMENT

Alhamdulillah, thank God because with His abundant grace we were able to complete the project and report at the appointed time. With the blessings, hard work and cooperation of all our group members, the Chable project was successfully completed.

We express our infinite appreciation to Mr. Muhammad Kamal Ariffin Bin Hj. Badrun as the supervisor for our Chable project because he has helped a lot by giving guidance, suggestions and emphasizing and monitoring the project we implement to run smoothly.

Don't forget to say a thousand thanks to our comrades who gave us a lot of support and opinions in completing this project. Also, don't forget all the lecturers who are directly and indirectly involved in the production of this project.

On this occasion also not to be forgotten, we would like to say a million thanks to our parents and all our family members who have given a lot of support, encouragement, and enthusiasm throughout this project.

Finally, thanks to everyone who helped us in completing this project.

Thank you.

ABSTRACT

Coffee tables known as Chable are used to support drinks, decorative objects, and other small items and act as decorative furniture for the living room. Until now the coffee tables that are produced and available have been designed in the usual form (big, wide, and outdated) and function as a coffee table only which does not meet the needs of today's customers. Therefore, this Project aims to design and develop a modern and multi-functional coffee table inspired by the Japanese modern coffee table for living rooms of various sizes. Various steps towards existing issues and design criteria required in designing a new coffee table, creating sketches, and developing miniatures and prototype models. In addition, a coffee table made of a combination of materials, namely, wood, metal and even glass as a finishing touch. A prototype of a modern and multifunctional coffee table model was developed as a design proposal.

Keyword: Coffee tables, Modern design, Multifunction

ABSTRAK

Meja kopi yang dikenali sebagai Chable digunakan untuk menyokong minuman, objek hiasan, dan barangan kecil lain dan bertindak sebagai perabot hiasan untuk ruang tamu. Sehingga kini meja kopi yang dihasilkan dan boleh didapati telah direka dalam bentuk biasa (besar, lebar, dan ketinggalan zaman) dan berfungsi sebagai meja kopi sahaja yang tidak memenuhi keperluan pelanggan hari ini. Oleh itu, Projek ini bertujuan untuk mereka bentuk dan membangunkan meja kopi moden dan pelbagai fungsi yang diilhamkan oleh meja kopi moden Jepun untuk ruang tamu dengan pelbagai saiz. Pelbagai langkah ke arah isu sedia ada dan kriteria reka bentuk yang diperlukan dalam mereka bentuk meja kopi baharu, mencipta lakaran dan membangunkan model miniatur dan prototaip. Di samping itu, meja kopi yang diperbuat daripada gabungan bahan, iaitu kayu, logam dan juga kaca sebagai sentuhan penamat.

Kata Kunci: Meja kopi, Reka bentuk moden, Pelbagai fungsi

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A coffee table is a low table that is usually placed in the living room. It is a piece of furniture that serves to place drinks, food, decorative items, and various other small items. Besides, it is also used to complete the interior decoration of the house, especially in the living room and is usually made of wood or other alternative materials (Cullen, 2015). The passage of time and lifestyle changes have contributed to changing tastes and consumer needs. In the past, most coffee tables were made of wood in a traditional style.

Figure 1.1 (a) Traditional Coffee Table

Now, there are various types of raw materials that are easily available that can be used to produce coffee tables and other furniture. In addition, the change in taste from the traditional style to other styles such as modern, contemporary, minimalist and others play a role in designing the coffee table so that it is compatible with the concept of decoration and other furniture placed in the living room. Early to mid-20th century, modern designs were introduced, starting with German and Scandinavian designs (Impiana, 2018; Genchey, 2013).

Figure 1.1 (b) Coffee Table from German

Figure 1.1 (c) Table from Scandinavian

This modern design has simple and uncluttered features. Multi-functional furniture is designed to meet the needs of users in decorating rooms, especially rooms that have a small area. There are various types of multipurpose furniture options on the market including coffee tables (Poetra, 2016). Where, the main use of the coffee table is to serve food and drinks, especially to guests, in addition to other functions, for example storage space and as a decorative item for the living rooming accordance with the desired decoration theme or concept. This makes multifunctional furniture more exclusive and modern in terms of its use (Thorgersen, 2016). The coffee table that will be designed is inspired by the modern Japanese coffee table. Modern and traditional Japanese tables have significant differences in terms of size, design, and function.

Figure 1.1 (d) Coffee Table from Japan

1.2 Objectives

a. Providing more convenience and comfort to users who use this coffee table.
b. Giving a new concept to the public and society today by applying technology resources in today's era.
c. Enables us to use the skills of operating machines and tools in the workshop.

1.3 Scope of Study

In making this modern coffee table we get inspired by the Japanese coffee table. Our coffee table Chable is designed with a wide range of functions and is easy to install. This product is also easy to move and move to another place. Chable also has its own uniqueness which is to have a hidden chair in it. When it comes to using the stool, you need to remove it only from the table. The Coffee Table offers a minimalistic yet classy look, featuring a geometric design suitable for any modern living area. It has a beautiful tempered glass top that sits perfectly upon a orange metal base, which is durable and hard-wearing, as well as being incredibly easy to clean. Its square design gives, and simple design gives it a minimalist charm, which is ideal for anyone who prefers a crisp, clean and modern décor in their home. It makes the perfect centerpiece for the contemporary living room and when paired with the Scope Lamp Table, it creates a timeless and versatile style in your home.

1.4 Significance of Study

The first wooden tables, which were specifically designed as coffee tables were made during the late Victorian era in Britain, particularly in the year 1868 when a table designed by E W Godwin was listed as a ‘coffee table’. This categorization of the table as a coffee table, made it to be the first example in Europe of the modern-day much-loved centerpiece. While other sources, simply list it as a table, hence it’s still unsure; however, the quirky fact about the traditional table is that it was quite high, about 27 inches high. When coffee tables became increasingly popular in the 20th century, it was not unknown for the table legs, and therefore it had to be shortened to be termed as a ‘coffee table’. The fad has gradually spread and today it has increasingly become an integral piece of furniture that homeowners never miss while decorating their homes.

Figure 1.4 (a) Example Coffee Table in Market

Coffee tables serve the purpose of not only placing cups of coffee or tea on them but also to place down magazines and books from your favorite authors. A light read is always preferable with your legs up on the table while you are cozily sitting on the couch. Books are visual treats and putting together some of your favorite authors and few magazines of different genres can keep you company and entertain your guests when they visit.

CHAPTER 2

LITERATURE STUDIES

2.1 Introduction

Coffee tables began to exist in the Victorian era, which is in the 18th century. In the beginning, the coffee table was only used as a place to place a cup of tea or coffee to serve guests (William, 2019). There are various types of coffee tables that exist until now, among them are traditional coffee tables, basic, contemporary, cottage style, industrial, village, Parsons, modern, and others (Decorate, 2019; Impiana, 2018; Lane, 2017). Coffee table design changes not only in terms of style or concept, but this also includes the height of the coffee table. Where, in the past, the coffee table was higher than the current coffee table. Due to the passage of time and changing tastes and current needs, the height of the coffee table is lower, and this is likely influenced by the lifestyle of the Japanese people. During the Art Nouveau period, various types of coffee table designs appeared because of the development of the Arts and Crafts Movement where this coffee table design was favored by the Victorians because of its clean, simple design, and emphasis on natural forms. Modern furniture design began in the late 19th century (Brommer, 2008). Modern coffee tables have characteristics such as being built based on clean lines, simple, practical, and made of curved wood or easily molded plastic (Lane, 2017).

Figure 2.1 (a) Modern Coffee Table Design in the 19th century

Nowadays, the development of the world's population which is increasing every year as well as the migration of rural people to the city for various purposes also affects the area of residence in a city. Vertical or multi-store dwellings such as apartments and condominiums are very easy to find in urban areas and can also be seen in rural areas. With a small and limited living area, the selection of appropriate furniture to decorate and support human daily activities is very important (Thorgersen, 2016). The selection of furniture with only one function will cause users to buy various furniture for a specific purpose. However, with the passage of time and demand, the production of multi-purpose furniture is able to overcome this problem to provide comfort and excess space for other uses (Astonkar & Kherde, 2015). Diagram 2 is one example of a multi-purpose coffee table where the design of this coffee table is combined with a chair as a seat.

(Husuno & Selimin, Research in Management of Technology and Business Vol. 1 No. 1 (2020) p. 326-336)

2.2 Origins of Coffee Table

(“A coffee table – definition of Coffee table in English from the Cambridge Dictionary ”), is a low table designed to be placed in a sitting area for convenient support of beverages, remote controls, magazines, books (especially large, illustrated coffee table books), decorative objects, and other small items. A modern white coffee table. Most coffee tables are made of wood (though faux wood tables are increasingly common) or glass and metal, typically, stainless steel or aluminum and may incorporate cabinets or drawers. Coffee tables were thought to initially be constructed in Renaissance England.

In Europe, the first tables specifically designed as and called coffee tables, appear to have been made in Britain during the late Victorian era. According to the listing in Victorian Furniture by (R. W. Symonds & B. B. Whineray) and also in The Country Life Book of English Furniture by Edward T. Joy, a table designed by E. W. Godwin in 1868 and made in large numbers by William Watt, and Collinson and Lock, is a coffee table. If this is correct it may be one of the earliest made in Europe. Other sources, however, list it only as "table" so this can not be stated categorically. Far from being a low table, this table was about twenty-seven inches high. Later coffee tables were designed as low tables and this idea may have come from the Ottoman Empire, based on the tables in use in tea gardens. However, as the Anglo-Japanese style was popular in Britain throughout the 1870s and 1880s and low tables were common in Japan, this seems to be an equally likely source for the concept of a long low table.

From the late 19th century onwards, many coffee tables were subsequently made in earlier styles due to the popularity of revivalism, so it is quite possible to find Louis XVI style coffee tables or Georgian style coffee tables, but there seems to be no evidence of a table actually made as a coffee table before this time. Joseph Aronson writing in 1938 defines a coffee table as a, "Low wide table now used before a sofa or couch. There is no historical precedent...," suggesting that coffee tables were a late development in the history of furniture. With the increasing availability of television sets from the 1950s onwards coffee tables really came into their own since they are low enough, even with cups and glasses on them, not to obstruct the view of the TV.

Coffee tables are an almost essential part of the modern living area. Without them, you'd be left without a place to rest a mug as you curl up with a beloved book and you'd undoubtedly find yourself lacking a space to display your favorite coffee table anthologies. The original concept behind what we now know as a coffee table began life in early 17th-century Europe. Tea tables of the time were placed in front of a group seating area or beside a chair. Designed to hold a full tea service for easy access by hostess and guests among the day's high-backed settees, tea tables were somewhat higher than the modern coffee table.

Today, coffee tables can be found in a variety of materials, shapes, and sizes, and under many different names. No matter what you call your table, however, it's important to find one constructed of quality materials that fit your unique design sensibilities.

2.3 Chable

Based on (" Chable – definition of chable in English from the Urban Dictionary") a chable is a combination of a 'chair' and 'table'. They are often found in classrooms or university lecture theatres. The table portion of the chable lifts up so the student can sit down and then close it once seated.

2.4 Inspired by Japanese Coffee Table (*Chabudai*)

Chabudai is defined in ("*Chabudai* – Wikipedia, the free encyclopedia), is a short-legged table used in traditional Japanese homes. The original *chabudai* ranged in height from just 15 cm to a maximum height of 30 cm. People seated at a *chabudai* may sit on zabuton or tatami rather than on chairs. The four legs of a *chabudai* are generally collapsible so that the table may be moved and stored easily. *Chabudai* are used for various purposes, such as study tables, work benches, or dinner tables.

Figure 2.4 (a) Example of Coffee Table Japanese

2.5 Material in Chable

2.5.1 Rubber Wood

Figure 2.5.1 (a) Product from rubberwood

Although it has been used on a small scale before, its use for making furniture has become more common in the late 20th and early 21st centuries with the development of chemical treatments to protect wood from fungal and insect attacks. There are extensive rubber plantations with mature trees, especially in Southeast Asia; early practice was to burn the tree at the end of its latex production cycle.

Currently, rubber plantation trees are generally harvested for wood after they complete the latex producing cycle, when they are 25 to 30 years old. When the latex yields become extremely low, the trees are then felled, and new trees are usually planted. This makes rubberwood 'eco-friendly' in that the wood is harvested from a renewable source. The wood from the trees is light in color and straight grained making it easy to stain and match in woodworking. Part of the industry adoption of rubberwood was an international campaign to avoid use of a previously used light straight grained wood which was harvested from Southeast Asia's endangered wetland ramin (Gonystylus).

Rubberwood is actually a by-product from the culling of the rubber tree. Rubberwood, also called Para wood in Thailand, is used in high-end furniture as it is valued for its dense grain, attractive color, minimal shrinkage, and acceptance of different finishes.

Figure 2.5.2 (b) Rubberwood Tree

It is also prized as an “ environmentally friendly ” wood, as it makes use of trees that have been cut down at the end of their latex- producing cycle. The older practice was to burn the “ useless ” tree. Rubberwood is a light hardwood. The wood is whitish yellow or pale cream when freshly cut and seasons to light straw or light brown. It is a diffuse porous wood with medium texture and straight grain. Sapwood and heartwood are not distinct.

Rubberwood has good machining and working qualities. It can be finished to a very glossy look on polishing and can be given ammonia fumigation cum bark extract-quenching treatment to obtain golden to dark brown hues and decorative figures. Rubberwood can be bent in steam or in ammonia to make curved items. Its take up stained to the shades of teak, rosewood, mahogany, beech, cherry etc. Rubberwood offers good resistance to Screw and Nail withdrawal forces.

India is now the third largest producer of natural rubber in the world. As we know that Rubberwood has long been brought to Thailand from South America and it grows well in rainforest areas. At that time all that was needed was latex to produce rubber products. Rubberwood itself may be understood as the best plantation wood because we can fully use all its parts to make products.

2.5.2 MS Angle QC

Figure 2.5.2 (a) MS Angle QC in market

A MS angle or mild steel angle is a L-shaped cross-section used in the construction of buildings and structures. The most commonly used MS steel angles are the ones forming a 90-degree angle with two sides of equal length and width. The angles with uniform sides are called equal angles and the ones with one side bigger than the other are called unequal angles.

Indostar are well-known MS angle manufacturers. Our MS angles come with superior mechanical properties, and are extremely convenient to weld, drill and cut to suit the individual requirements of every construction. Being a popular MS angle supplier, Indostar's equal and unequal angles are highly versatile and can be used in a number of engineering applications such as reinforcement, transmission towers, bridges, sheds, etc. Their anti-corrosion property increases the life of the structures built by using them. All the required standards of quality are met while producing the Indostar MS angle iron that gives an extra assurance of strength and safety for your structure.

Indostar MS Angles are available in a variety of different sizes, grades and finishes. The products provided by us are extremely pocket-friendly that will help you decrease the overall cost of your construction process. Our mild steel angles can be easily customized by cutting, drilling and machining them to size to suit all your requirements.

The different variants in which our MS angles are available are:

- ISA – 80x80x6/8mm
- ISA – 90x90x6/8/10/12mm
- ISA – 100x100x6/8/10mm
- ISA – 110x110x8/10/12mm
- ISA – 130x130x8/10/12mm
- ISA – 150x150x12/16/20mm

2.5.3 Tempered Glass

Figure 2.5.3 (a) Tempered glass use in chable

Based on (“Tempered Glass – Wikipedia, the free encyclopedia”) Tempered or toughened glass is a type of safety glass processed by controlled thermal or chemical treatments to increase its strength compared with normal glass. Tempering puts the outer surfaces into compression and the interior into tension. Tempered glass is used for its safety and strength in a variety of applications, including passenger vehicle windows, shower doors, aquariums, architectural glass doors and tables, refrigerator trays, mobile phone screen protectors, bulletproof glass components, diving masks, and plates and cookware.

Francois Barthelemy Alfred Royer de la Bastie (1830–1901) of Paris, France is credited with first developing a method of tempering glass by quenching almost molten glass in a heated bath of oil or grease in 1874, the method patented in England on August 12, 1874, patent number 2783. Tempered glass is sometimes known as Bastie glass after de la Bastie. In 1877 the German Friedrich Siemens developed a different process, sometimes called compressed glass or Siemens glass, producing a tempered glass stronger than the Bastie process by pressing the glass in cool molds. The first patent on a whole process to make tempered glass was held by chemist Rudolph A. Seiden who was born in 1900 in Austria and emigrated to the United States in 1935.

Though the underlying mechanism was not known at the time, the effects of "tempering" glass have been known for centuries. In about 1660, Prince Rupert of the Rhine brought the discovery of what are now known as "Prince Rupert's Drops" to the attention of King Charles II. These are teardrop-shaped bits of glass which are produced by allowing a molten drop of glass to fall into a bucket of water, thereby rapidly cooling it. They can withstand a blow from a hammer on the bulbous end without breaking, but the drops will disintegrate explosively into powder if the tail end is even slightly damaged.

2.6 Machine

2.6.1 Sliding Table Saw

Table Saw mentioned in Wikipedia the free of encyclopedia, A table saw (also known as a saw bench or bench saw in England) is a woodworking tool, consisting of a circular saw blade, mounted on an arbor, that is driven by an electric motor (either directly, by belt, or by gears). The blade protrudes through the top of a table, which provides support for the material, usually wood, being cut. In most modern table saws, the depth of the cut is varied by moving the blade up and down: the higher the blade protrudes above the table, the deeper the cut that is made in the material. In some early table saws, the blade and arbor were fixed, and the table was moved up and down to expose more or less of the blade. The angle of cut is controlled by adjusting the angle of blade. Some earlier saws angled the table to control the cut angle. In the United States, perhaps the first recorded patent for the circular saw was issued in 1777 to an Englishman, Samuel Miller; it refers to a circular saw that was created in Holland in the 16th or 17th century. The 1885 catalog of the W.F. & John Barnes Co., Rockford, Il.

Figure 2.6.1 (a) Sliding Table Saw at Polytechnic Shah Alam

A sliding table saw, also called a European cabinet saw or panel saw, is a variation on the traditional cabinet saw. They are generally used to cut large panels and sheet goods, such as plywood or MDF. Sliding table saws have a sliding table on the left side of the blade, usually attached to a folding arm mounted under the table, that is used for cross cutting and ripping larger materials. Sliding table saws are the largest type of table saw, and are mostly used by large production cabinet shops. Most saws use 3–5, or even 7hp three- phase induction motors. Sliding table saws usually incorporate a riving knife to prevent kickback from occurring.

Sliding saws sometimes offer a scoring blade, which is a second, smaller diameter blade mounted in front of the regular saw blade. The scoring blade helps reduce splintering the lower face in certain types of stock, especially laminated stock. European models are sometimes available in multi-purpose tool configurations (Combination machine) that offer jointer, planer, shaper(Spindle moulder in Europe) or boring features. The blade arbor typically has a diameter of 30 mm, around twice that of a US saw. Many American woodworkers are likely to use a dado stack or wobble dado to cut dados (square sectioned grooves), while most European woodworkers would use a shaper or a router table for this task.

In recent years, European-style sliding table saws have had a small following in North America. They are usually either imported from European manufacturers such as Felder and its subsidiaries, Altendorf and Robland, Taiwanese companies such as Grizzly Industrial, or sold directly by U.S. based companies such as Powermatic.

2.7 AutoCAD

2.7.1 Introduction to AutoCAD

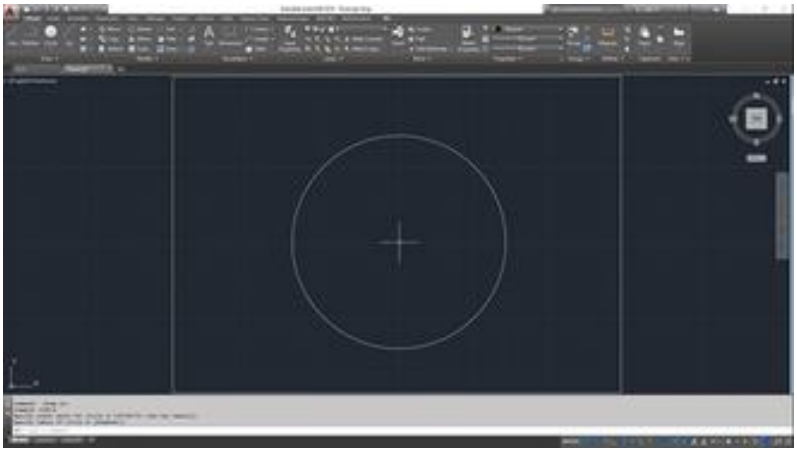


Figure 2.7.1 (a) AutoCAD

Based on (“AutoCAD – Wikipedia, the free encyclopedia”) is a commercial computer-aided design (CAD) and drafting software application. Developed and marketed by Autodesk, AutoCAD was first released in December 1982 as a desktop app running on microcomputers with internal graphics controllers. Before AutoCAD was introduced, most commercial CAD programs ran on mainframe computers or minicomputers, with each CAD operator (user) working at a separate graphics terminal. AutoCAD is also available as mobile and web apps. AutoCAD is used in industry, by architects, project managers, engineers, graphic designers, city planners and other professionals. It was supported by 750 training centers worldwide in 1994.

AutoCAD was derived from a program that began in 1977, and then released in 1979 called Interact CAD, also referred to in early Autodesk documents as MicroCAD, which was written prior to Autodesk's (then Marinchip Software Partners) formation by Autodesk cofounder Michael Riddle.

Figure 2.7.1 (b) A man using AutoCAD 2.6 to digitize a drawing of a school building.

The first version by Autodesk was demonstrated at the 1982 Comdex and released that December. AutoCAD supported CP/M-80 computers. As Autodesk's flagship product, by March 1986 AutoCAD had become the most ubiquitous CAD program worldwide. The 2022 release marked the 36th major release of AutoCAD for Windows and the 12th consecutive year of AutoCAD for Mac. The native file format of AutoCAD is .dwg. This and, to a lesser extent, its interchange file format DXF, have become de facto, if proprietary, standards for CAD data interoperability, particularly for 2D drawing exchange. AutoCAD has included support for .dwf, a format developed and promoted by Autodesk, for publishing CAD data.

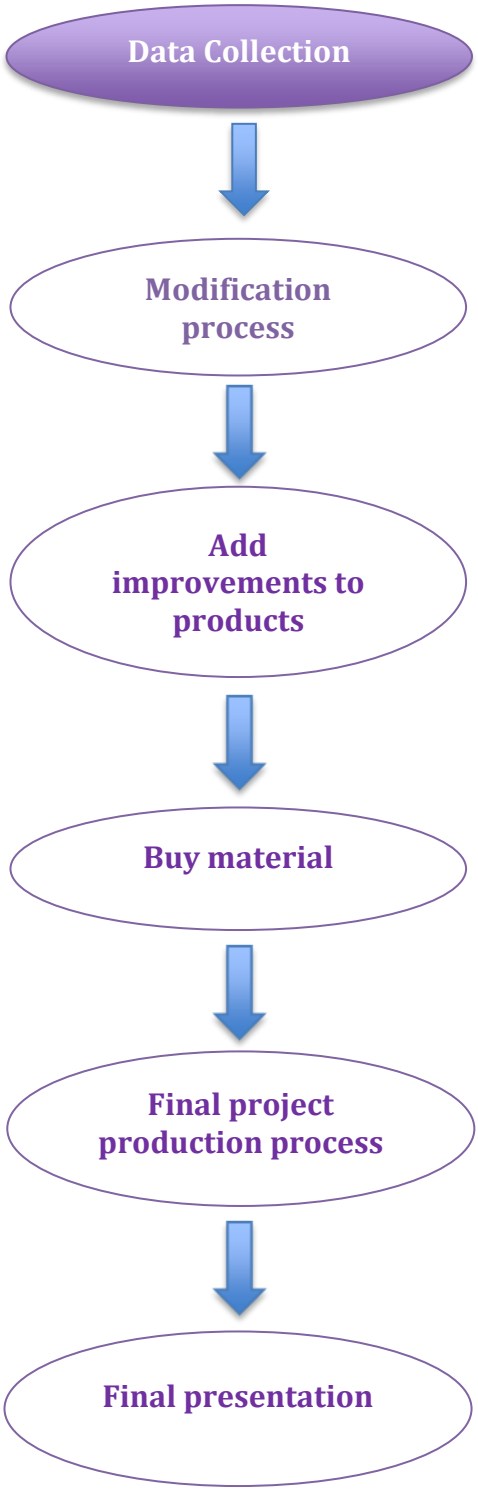
CHAPTER 3

METHODOLOGY

3.1 Introduction

The basis of our group's search is from internet sources which is one of the easy access to use. The effectiveness of this project is to ensure whether this Chable can function properly or otherwise. To ensure that this "Chable" coffee table can function properly, it needs to be monitored from time to time. With this, the use of this coffee table may help in reducing the problems experienced by users.

3.2 Methodology Flow Chart



3.3 Design Project

3.3.1 Product Sketch

Make an initial product sketch using the 2- and 3-point perspective method.

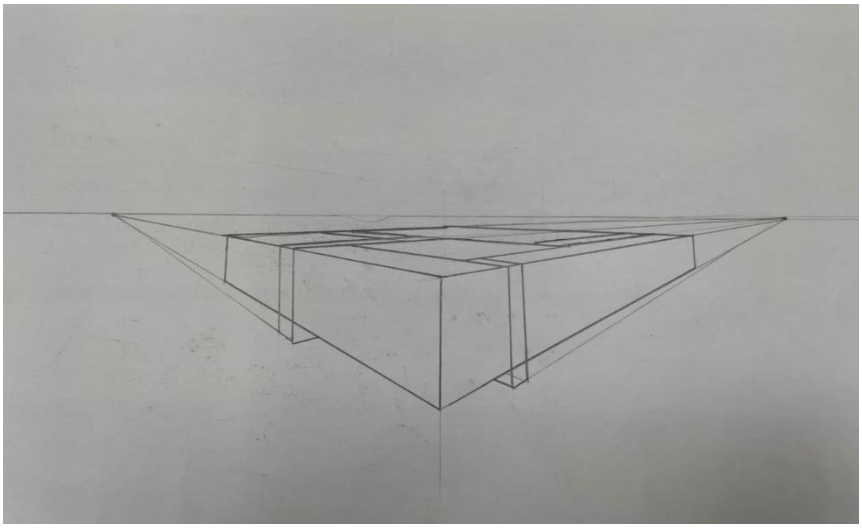


Figure 3.3.1 (a) 2-point perspective

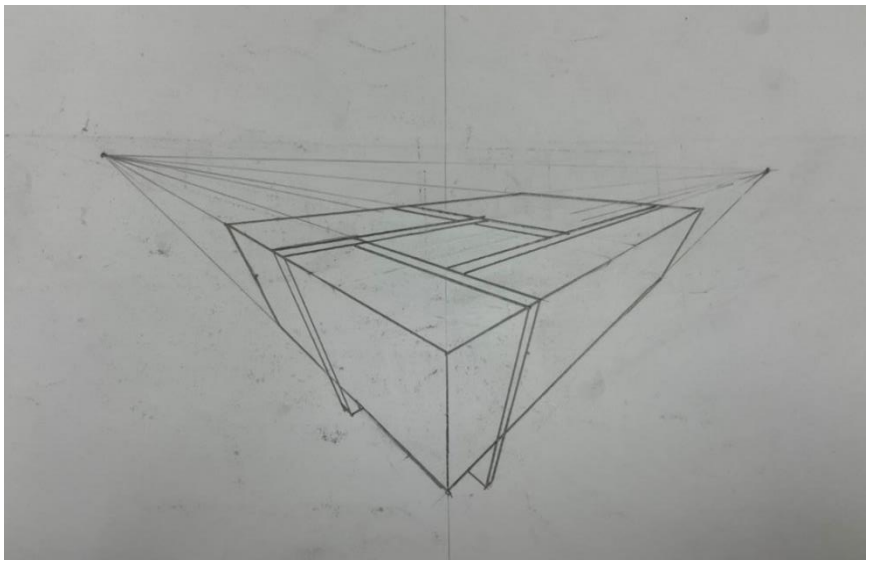


Figure 3.3.1 (b) 3-point perspective

After completing the sketch part, this project continues to the next process which is the process of making Drawings using the AutoCAD application.

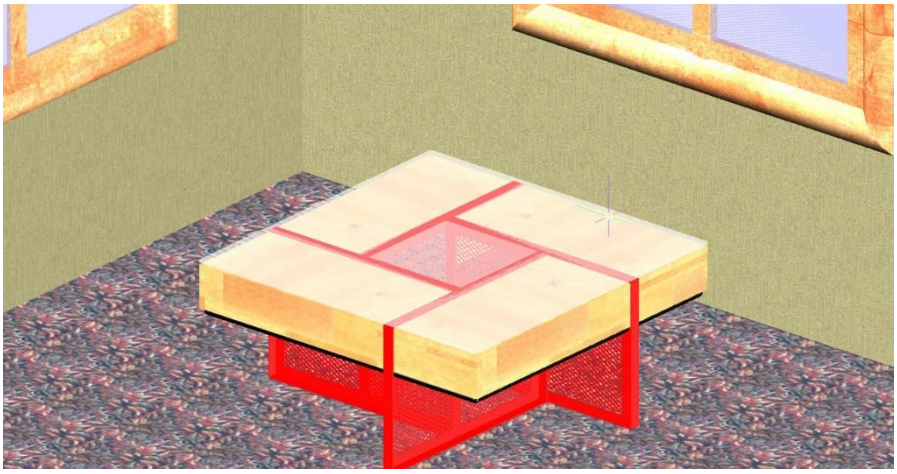


Figure 3.3.1 (c) drawing in AutoCAD

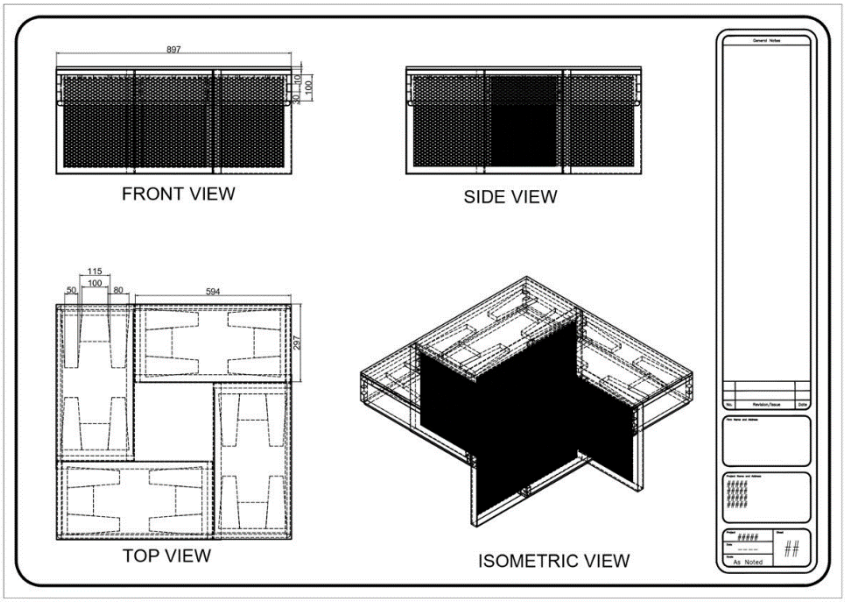


Figure 3.3.1 (d) autographic drawing in autoCAD

3.4 Preparation of Materials

Figure 3.4 (a) Measuring Rubberwood to buy

Figure 3.4 (b) Buying it for Chable manufacturing.

3.5 Project Production Process

1. First of all we cut Rubberwood using Sliding Table Saw according to the measurements set out in AutoCAD.

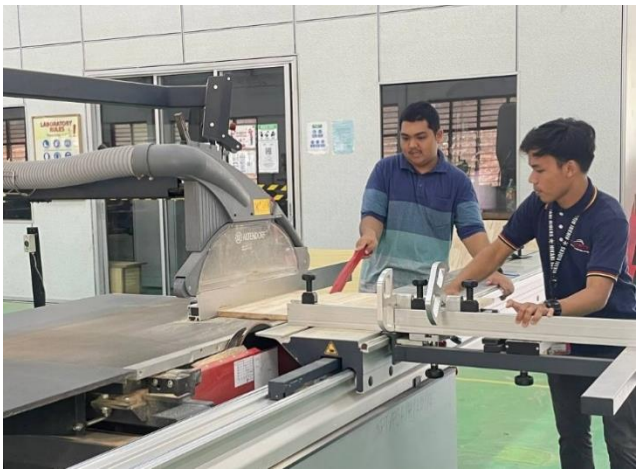


Image 3.5 (a) Showing cut a Rubberwood using Sliding Table Saw at polytechnic.

2. Then make a date on the Chable. First make measurements on the wood that has been cut. We chose to make a Finger Joint-type mortise.

Image 3.5 (b) Showing make a measurement to make a Finger Joint.

3. Next make a mortise on the legs of the table using dowels. Attach the dowel to the table leg using wood glue.

Image 3.5 (c) Showing attach dowel to table leg using wood glue.

4. Next, cut the iron angle using a grinder.

Image 3.5 (d) Showing cut the iron angle.

5. Then, the wood that was on the stairs was grafted.

Image 3.5 (e) Showing crafted the wood.

6. Finish grafting the legs of the table, then the table legs are installed using dowels.

Image 3.5 (f) Showing installed dowels at table leg.

7. Then, install the legs of the table and put the hinges.

8. Finishing the legs of the table, we sander the entire table to look neater.

Image 3.5 (g) Showing sander the entire table.

9. Make finishing using a clear stain of 3 layers.

Image 3.5 (h) Showing make a finishing.

10. Welding iron angle becomes a structure to be used as a table leg.

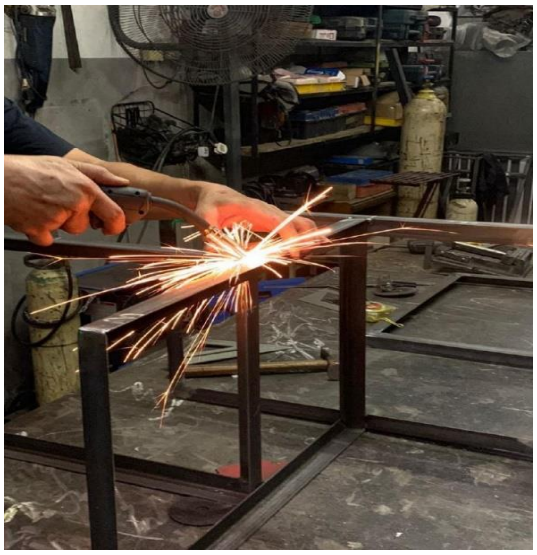


Image 3.5 (i) Showing welding iron angle becomes a structure.

11. Welding expended metal on structure.

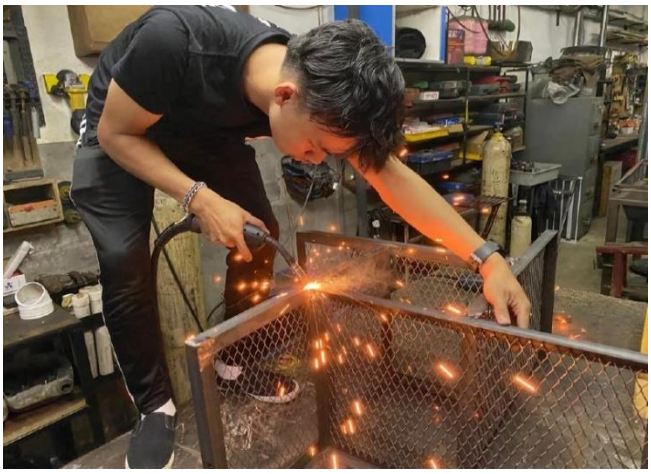


Image 3.5 (j) Showing welding expended metal.

12. Welding brackets to accommodate rubberwood.

Image 3.5 (k) Showing welding a brackets.

13. Sharpening the entire structure that has been welded.

Image 3.5 (l) Showing sharpening the entire structure.

14. Coating the structure for the neater.

Image 3.5 (m) Showing coating the structure.

15. Painting the structure in orange colour with anti-rust spray.

Image 3.5 (n) Showing painting the structure.

16. Packing the structure using clear spray.

17. Putting silicone on the structure to accommodate the glass tabletop.

18. The results of Chable.

Image 3.5 (o) Showing a Chable produced.

3.6 Estimated Cost

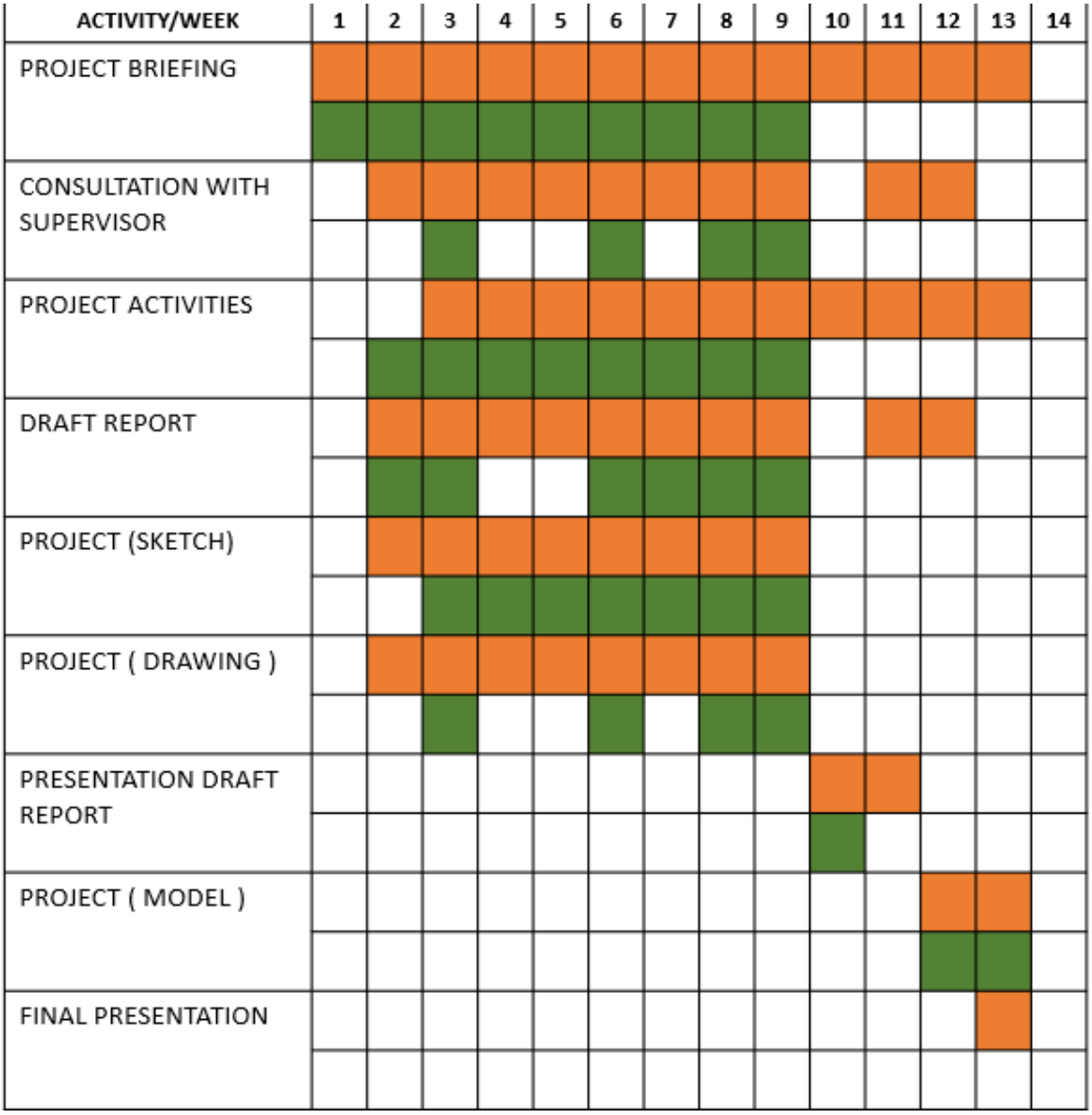
This is the cost budget we invested in making this Chable.

No.	Description	Qty	UOM	Rate	Amount
1	3MM X 30MM X 30MM X 6M MS ANGLE CQ	2.00	PCS	44.50	89.00
2	18MM X 600MM X 1200MM SOLID RUBBER WOOD BOARD	2.00	PCS	103.90	207.80
3	SPRAY COLOUR	6.00	PCS	16.90	101.40
4	SPRAY CLEAR	2.00	PCS	16.90	33.80
5	WOOD STAIN CLEAR	1.00	PCS	35.00	35.00
6	ENGSEL	1.00	PCS	8.90	8.90
7	SILICON	1.00	PCS	8.90	8.90
8	TEMPERED GLASS 935 X 935	1.00	PCS	150.00	150.00
				TOTAL: RM 634.80	

Figure 3.6 (a) Costs incurred to make Chable.

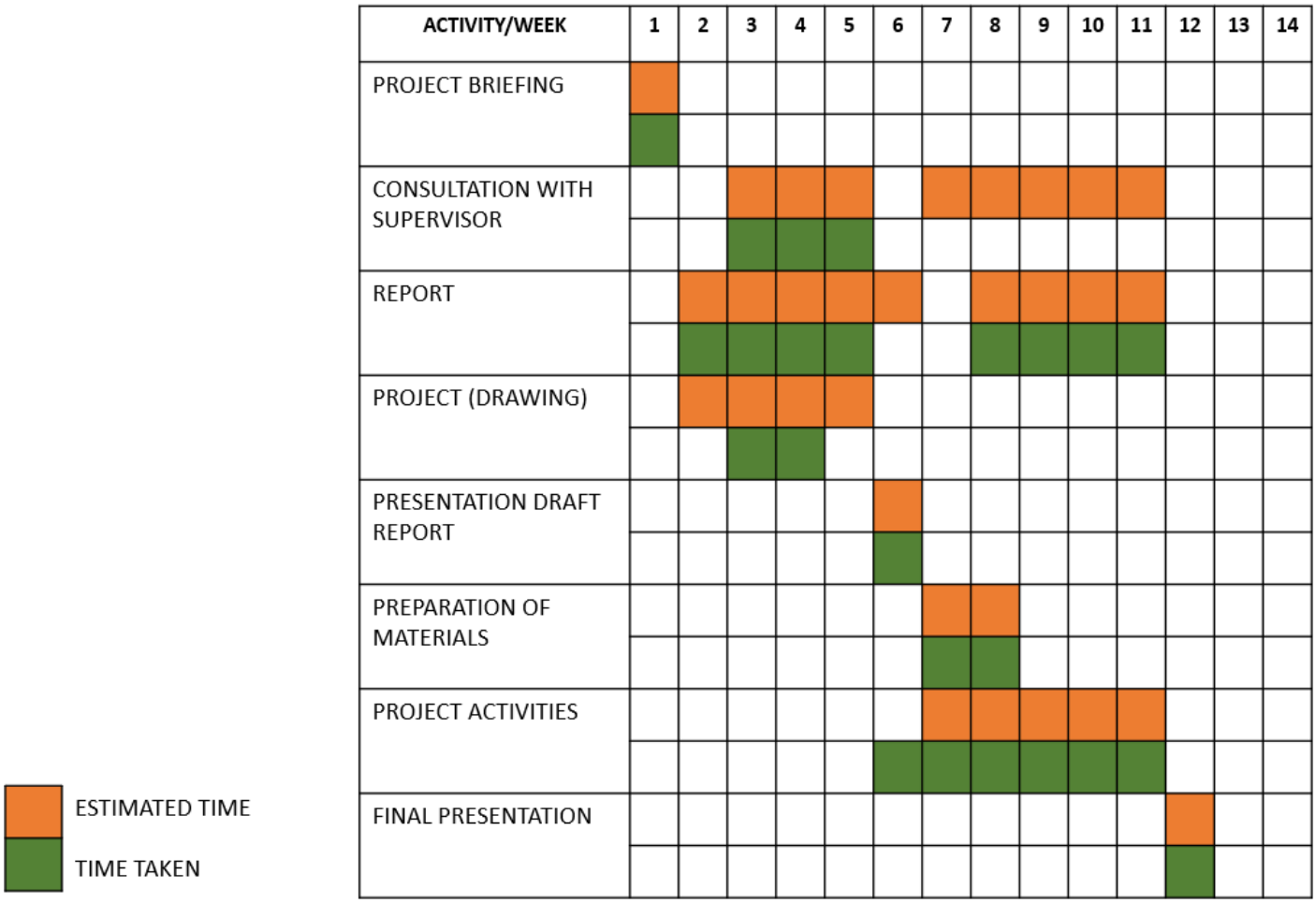
3.7 Gantt Chart

This is the Gantt chart during the final project production process for semester 4.



This is the Gantt chart during the final project production process for semester 5.

Gant Chart Semester 5



CHAPTER 4

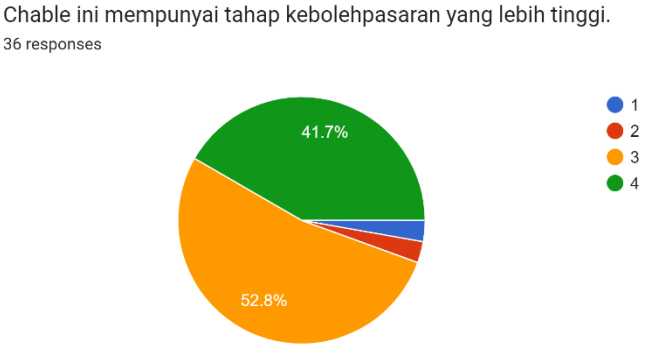
RESULTS AND DISCUSSIONS

4.1 Introduction

Generate a questionnaire to find out the effectiveness of Chabel by users and also information that helps this project to be produced successfully. A total of 36 respondents answered this questionnaire where gender 45.5% were male and 54.5% were female.

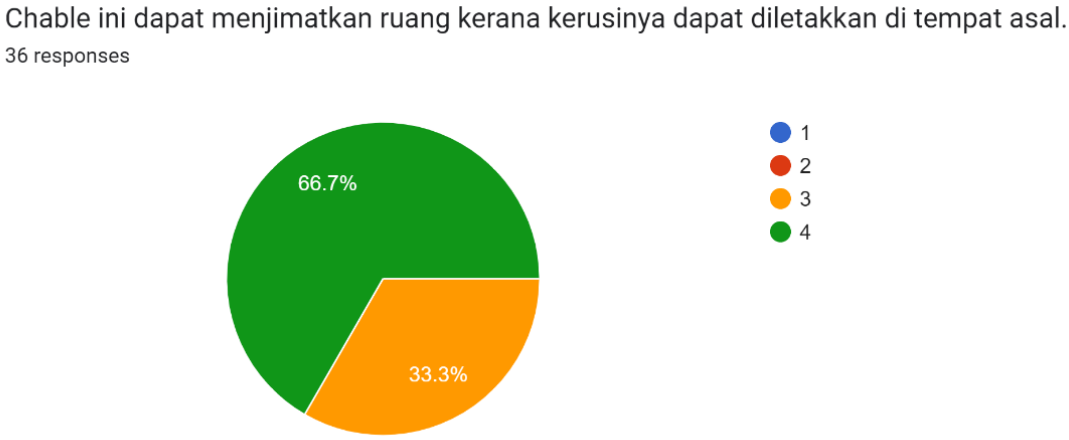
4.2 Survey results (Questionnaires)

4.2.1 The results of the respondent answers from the questionnaire in examining whether this Chable has a higher level of employability.



Referring to the results found, a majority of 52.8% agreed that Chable had a high level of employability and 41.7% of respondents strongly agreed that Chable had a high level of marketability. This shows Chable is in demand among many users.

4.2.2 The results of the respondent answers from the questionnaire in Chable can save space as the chair can be placed in the original place.



Referring to the findings, a majority of 66.7% strongly agreed and 33.3% agreed that this Chable could save space as the seat could be placed in the original place if it did not want to use it again. In conclusion, this Chable is very useful to users as it can provide comfort to the user as well as an attractive design.

CHAPTER 5

CONCLUSION

5.1 Introduction

In this topic we share a little bit about what our group has done from the beginning to the end of the report to complete all the tasks of our proposal project report. Instead of us making design ideas to produce one product until we were ready to make a whole report on these Chable (coffee table). In addition, in this topic our group will discuss related to Chable that we have chosen as our project. In fact, we will place the Chable we have made at Shah Alam Polytechnic for the convenience of the public to use the Chable we have built specially to sit and relax or do a study group.

5.2 Conclusion

At the end of this study, we can conclude that the project work of this proposal requires Cooperation from colleagues and supervisors for us to complete this assignment. In fact, the explanation in each of the steps for us to complete all these reports was explained by our coordinator, Mr. Zullhyfrizfee with the guidance of our supervisor Mr. Kamal Ariffin. We also attended the FYP information workshop presented by Dr Parameswari A/P Shunmugam and Mrs. Norhayati Binti Majid related to literature review writing and also final project report. This makes it easier for us to do research as well as complete our Chable project report. In addition, our supervisors also taught and helped us how to get started in stage and make sure the Chable design well produced and safe for the production process. Not forgetting, the cooperation of each party plays a role in completing the task of this report. This shows that responsibility is very important, and we need to keep it in ourselves. Finally, this practice also gives us some basic knowledge on the making of this Chable.

5.3 Recommendation

This chapter will provide a summary of our study, associate Chable with research, and suggest possible directions for future studies. A total of 3 members of our group did research related to Chable (coffee table) for the purpose of producing the best product. For the improvement of Chable, the Chable comes with a custom to place various decorative items in the middle such as magazines, flowerpots, and other items. In addition, tempted glass can also be replaced with ceramic glass at the request of the user. Apart from being used during leisure, Chable can also be used in kindergarten for children's use as Chable height is ideal for children to paint, write on it.

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