GLAM MIRROR

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DIPLOMA IN BUSINESS STUDIES

SESI I 2024/2025

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

PRODUCT:

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A Project report submitted in partial fulfilment of the requirement for the award of Diploma in Business Studies

COMMERCE DEPARTMENT

SESSION II 2023/2024

DECLARATION OF ORIGINALITTY

TITLE : GLAM MIRROR

SESSION: II 2023/2024

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are a final year student of Diploma in Business Studies, Commerce Department, Polytechnic Sultan Salahuddin Abdul Aziz Shah, which is located at Persiaran Usahawan, 40150 Shah Alam, Selangor

2. Without appropriating or imitating any intellectual property rights of third parties, we acknowledge that the "Glam Mirror" and the intellectual property included in it are our original works.

3. To fulfil the requirements for the award of the **Diploma in Business Studies**, we consented to transfer ownership of the intellectual property "Glam Mirror" to "Polytechnic Sultan Salahuddin Abdul Aziz Shah"

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As the project Supervisor (_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _)

PUAN NORHAYATI BINTI OTHMAN

LETTER OF AUTHORIZATION

We declare that the work in this final year project paper was carried out in accordance with the regulation of Polytechnic. It is original and is the result of our own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any diploma or qualification.

We, hereby, acknowledge that we have been supplied with the Academic Rules and Regulations for Undergraduate , Polytechnic, regulating the conduct of my study and research.

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ABSTRACT

A glam mirror equipped with three LED color options, small compartment storage, a standing base, and flexible height adjustment offers an advanced, multi-functional solution for grooming and styling. The three adjustable LED color settings typically cool, warm, and neutral. Allow users to tailor the lighting to various tasks, ensuring precise makeup application or skincare routines under the most suitable conditions. The built-in storage compartments offer a practical solution for organizing cosmetics and accessories, reducing surface clutter and enhancing ease of access. The standing base adds stability and portability, making it convenient to move and place the mirror anywhere in a room. Additionally, the flexible height adjustment feature provides ergonomic comfort, allowing users to position the mirror at their ideal height, whether standing or sitting, catering to people of different statures. This mirror's combination of advanced lighting, organized storage, and flexible design not only improves everyday routines but also enhances the overall aesthetic appeal of living spaces, offering both functionality and style.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In today's world, people like to look in the mirror to see themselves, use the mirror every day for routine activities. A mirror is a fascinating object that reflects light, creating an image of whatever is in front of it. Typically made of glass coated with a thin layer of metal, mirrors have been used for centuries in various cultures for practical purposes, such as grooming and decoration. Mirrors are important tools in our daily lives, serving various purposes. They help us with personal grooming, allowing us to see our appearance and boost our confidence. Beyond their practical uses, mirrors encourage self-reflection, prompting us to think about our identity and how we perceive ourselves.

1.1 PROJECT BACKGROUND

The beauty and personal grooming industry has seen significant growth in recent years, driven by a surge in consumer interest in skincare, makeup, and self-care practices. As individuals increasingly prioritize their appearance and invest in grooming products, the demand for innovative tools that enhance these routines has also risen. Within this context, mirrors play a crucial role, serving as essential tools for makeup application, skincare routines, and personal grooming.

Traditionally, basic mirrors have offered limited functionality, primarily serving the purpose of reflection without any added features to enhance user experience. These mirrors often lack adequate lighting, storage solutions, and ergonomic design, leading to challenges in achieving desired grooming results. Poor lighting conditions can affect makeup accuracy, while cluttered surfaces can hinder efficiency and organization. As consumers seek to improve their grooming experiences, there is a clear market opportunity for mirrors that combine practicality with modern design.

Our Glam mirror addresses these needs by incorporating advanced features that elevate the user experience. Equipped with three LED color options warm, cool, and neutral. This mirror allows users to adjust the lighting to mimic different environments, ensuring optimal conditions for makeup application and skincare routines. The built-in small compartment storage offers a practical solution for organizing beauty products

and accessories, reducing clutter and streamlining daily routines. Additionally, the standing base provides stability and mobility, enabling users to position the mirror conveniently in various spaces, such as bedrooms, bathrooms, or dressing areas.

Our Glam mirror product is flexible height adjustment feature enhances ergonomic comfort, allowing users to customize the mirror's position according to their preferences and needs, whether sitting or standing. This adaptability makes the glam mirror suitable for a diverse range of users, including those with different heights or mobility requirements.

Our project aims to develop and market a glam mirror that transforms the traditional mirror into a multifunctional tool that meets the evolving demands of consumers in the beauty and grooming sector. By focusing on functionality, organization, and modern design, the glam mirror not only enhances personal grooming routines but also adds aesthetic value to any space, positioning it as an essential addition to contemporary beauty practices.

1.2 PROBLEM STATEMENT

Traditional mirrors are often designed with a one-size-fits-all approach, which can create several inconveniences for users with different heights and needs. For shorter individuals or those with mobility challenges, traditional mirrors are frequently mounted too high, making it difficult to use them effectively without the need for additional support, such as stepping stools or bending down. This lack of adjustability leads to discomfort and limits the functionality of the mirror. Additionally, traditional mirrors typically do not include enhanced lighting or storage features, making them less efficient for tasks such as grooming, applying makeup, or self-care routines in low-light environments.

1.3 PROJECT OBJECTIVE

- To develop an eco-friendly, adjustable mirror design that incorporates LED lighting and compartmentalized storage for a more functional, accessible, and aesthetically pleasing product.
- To develop the specific needs and preferences of users and ensuring that the final product meets the expectations of various user groups.
- To implement and test sustainable materials and production practices in the creation of the mirror, promoting an environmentally responsible approach from design to distribution.

1.4 PROJECT QUESTIONS

1. How do built-in LED lights improve the daily routines of college students?

2. How important is the adjustability of a mirror for students who use it in various ways?

3. What items are students most likely to store in a mirror compartment?

1.5 SCOPE OF PROJECT

The project will focus on creating a smart, adjustable mirror that includes built-in lighting and storage. The goal is to understand what college students prefer in a mirror and design something that's both practical and visually appealing for small living spaces.

1.6 SIGNIFICANT OF PROJECT

Culinary Inovation - creating new and unique dishes or food products

Global Accessibility - making food products accessible and available to people around the world

Extended Shelf Life- involves increasing the amount of time a food product can be stored before it spoils

Export Opportunities - potential for selling products in international markets

Health and Nutrition - focuses on the nutritional value and health benefits of food product

1.6.1 SWOT ANALYSIS

STRENGTH	WEAKNESS
• Accessibility & Inclusivity: The mirror provides an adjustable height feature, catering to users of various heights and abilities, enhancing inclusivity. • Multi-functional Design: The combination of LED lights, adjustable height, and built-in compartment makes the mirror both practical and space-efficient	• Cost of Production: Incorporating adjustable height mechanisms and built-in compartments might lead to higher production costs compared to traditional mirrors. • Technological Complexity: The automatic adjustment system could have mechanical or software challenges, leading to potential reliability issues over time.
OPPORTUNITY	**TREATS**
• Growing Demand for Smart Home Products: The smart home market is expanding, creating an opportunity to tap into this trend with an innovative product that enhances user convenience. • Health & Wellness Trends: There is a growing emphasis on products that enhance comfort and ergonomics, especially for personal care. The mirror could be marketed as a wellness product.	• Competition: Established brands in home goods or smart technology sectors could quickly develop and launch competing products. • Price Sensitivity: If the product is positioned at a premium price point due to its features, price-conscious consumers might opt for cheaper, traditional mirrors.

1.6.2 PROJECT ADVANTAGES

Our innovative mirror offers a range of unique advantages that cater to diverse needs, particularly for shorter individuals and those who value convenience and inclusivity. The height adjustability feature ensures that the mirror can be comfortably used by people of varying heights, making it especially helpful for shorter individuals who might otherwise struggle with standard mirrors. This customization eliminates the need for stools or other aids, allowing users to adjust the mirror to their preferred height, ensuring ease and comfort during grooming or makeup application.

A key benefit of this mirror is its Muslim-friendly design, specifically catering to hijab-wearing individuals. Many Muslim women, especially those who wear hijabs, need a mirror that focuses more on the upper part of the body, including the head and shoulders. This mirror provides exactly that, offering a clear reflection that aids in hijab styling while maintaining modesty. This specialized feature ensures that it meets the unique needs of Muslim women, offering a more personal and thoughtful design than regular mirrors.

Incorporating compartmentalization, this mirror promotes better organization by providing built-in storage spaces for personal items such as cosmetics, accessories, and grooming tools. This thoughtful addition enhances the user experience by making essential items accessible without cluttering the surrounding area. Integrating storage solutions directly into the mirror design, saves time and space, making it a practical choice for modern users.

The inclusion of LED lighting is another major advantage. These built-in lights provide superior illumination, eliminating shadows and offering even, adjustable lighting. This feature is particularly beneficial for tasks requiring precision, such as applying makeup or shaving. The energy-efficient nature of LED lights also adds an eco-friendly dimension, consuming far less power than traditional bulbs and contributing to overall energy savings.

Lastly, the mirror is designed with eco-friendliness in mind. It uses sustainable materials and incorporates energy-efficient technologies, such as LED lights and potentially solar-powered or low-energy mechanisms for height adjustment. This makes it an environmentally conscious choice, appealing to users who prioritize sustainability. Additionally, the durable construction ensures that the mirror has a long lifespan, reducing waste and the need for frequent replacements.

In summary, this mirror not only addresses specific needs like height adjustability and hijab styling but also provides a modern, eco-conscious solution that enhances convenience, organization, and energy efficiency for today's consumers.

1.7 JUSTIFICATION OF BUSINESS PROJECT SELECTION

The incorporation of LED lighting is a key feature that enhances visibility during grooming and makeup application. LED technology offers a brighter, more consistent light source compared to traditional lighting, while being highly energy-efficient. This aligns with the increasing consumer preference for sustainable products by minimizing energy consumption and reducing electricity costs. The use of energy-saving LEDs underscores the product's commitment to environmental sustainability, meeting the growing demand for eco-friendly living solutions.

The mirror's compartmentalized design significantly increases its functionality by addressing common issues of clutter and disorganization. By integrating built-in storage for cosmetics, grooming tools, and accessories, the product goes beyond being a mere decorative item. It offers a practical, space-saving solution that helps users maintain an organized, tidy environment. This added convenience is particularly appealing to consumers seeking efficiency and multi-functional products in their daily routines.

The adjustable height feature further enhances the mirror's versatility. By allowing users to modify the mirror's height to suit their needs, whether standing or seated, the product accommodates individuals of varying heights and preferences. This feature is especially beneficial in shared households or commercial settings, where users may have different requirements. The adjustable height ensures comfort and flexibility, making the mirror accessible to a broader range of users, which enhances its usability in diverse settings.

Sustainability is central to the design of this product, evident in the choice of eco-friendly materials and manufacturing processes. As environmental consciousness continues to rise, consumers increasingly seek products that align with their values of sustainability and minimal environmental impact. By utilizing renewable materials and energy-efficient components, the mirror reflects a commitment to reducing waste and lowering the carbon footprint. This focus on sustainability not only differentiates the product but also resonates with eco-conscious customers who prioritize responsible consumption.

The hijab-friendly design of the mirror highlights its cultural inclusivity. Many hijab-wearing women require specific accommodations during grooming, such as the ability to view themselves from different angles while maintaining modesty. The adjustable height and wide-angle viewing features of the mirror address these needs, providing a comfortable and practical solution. By catering to the specific requirements of this demographic, the product promotes inclusivity and enhances its appeal in a culturally diverse market.

1.8 OPERATIONAL DEFINITION

The mirror includes built-in LED lights that provide a minimum illumination of 300 lux at a distance of 50 cm. The LED lights must consume no more than 5 watts of power and have a lifespan of at least 50,000 hours. Energy efficiency is measured by the product's wattage consumption in relation to its light output.

The mirror will have a minimum of three storage compartments, each with a capacity to hold items measuring up to 10 cm in height, 5 cm in width, and 5 cm in depth. The compartments should be easily accessible and support the organized storage of cosmetics, grooming tools, and accessories. The ease of access and space optimization will be assessed by user feedback and product testing.

The mirror's height must be adjustable by at least 30 cm, allowing it to be set at various heights between 100 cm and 130 cm from the base to accommodate users of different statures. The ease and durability of the height adjustment mechanism will be evaluated through repeated usage tests, ensuring that the mechanism remains functional after 10,000 height adjustments.

The mirror must be constructed using at least 80% renewable or recycled materials, with components sourced from suppliers that adhere to environmentally sustainable practices. The product's environmental impact will be measured by a life-cycle assessment (LCA), which considers the carbon footprint, recyclability, and waste generated during the manufacturing process.

The mirror must have a wide-angle viewing feature, allowing users to see themselves from different angles without needing to adjust the mirror excessively. It must also maintain modesty by providing at least 180-degree coverage at adjustable angles. This feature will be assessed through user testing with hijab-wearing participants to ensure it meets their needs for privacy and comfort during grooming.

1.9 SUMMARY

The glam mirror project aims to revolutionize the traditional mirror by incorporating three LED color options, small compartment storage, a standing base, and flexible height adjustment. Recognizing the growing consumer interest in personal grooming and beauty, this innovative product addresses common challenges associated with basic mirrors, such as inadequate lighting, lack of organization, and ergonomic design.

With its three adjustable LED lighting settings—warm, cool, and neutral—the glam mirror provides optimal illumination for makeup application and skincare routines, ensuring accurate results under various conditions. The built-in small compartment storage offers a practical solution for organizing beauty products and accessories, minimizing clutter and enhancing efficiency.

Additionally, the standing base allows for easy repositioning in different spaces, while the flexible height adjustment feature caters to users of various heights and preferences, ensuring comfort and usability. This combination of advanced features transforms the glam mirror into a versatile and stylish tool, making it an essential addition to modern beauty practices.

Overall, the project positions the glam mirror as a multifunctional product that meets the evolving demands of consumers, improving their grooming experiences while adding aesthetic value to any environment.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter looks at the current technology used in smart mirrors, focusing on LED lighting, adjustable heights, and storage features. The aim is to see how these elements can make a difference in students' daily lives.

2.2 PREVIOUS STUDIES/REVIEW/INVESTIGATIONS

Studies have shown that built-in LED lights in mirrors greatly improve visibility, especially in low-light situations. Mirrors that are adjustable provide ergonomic comfort, and compartments help make better use of space, which is a top priority for students living in dorms or shared apartments.

2.2.1 WASTAGES IN GLAM MIRROR

In the development and production of a glam mirror with three LED color options, small compartment storage, a standing base, and flexible height adjustment, several forms of wastage can arise if not carefully managed. One major area of wastage comes from excessive material use, particularly if non-recyclable plastics, metals, or packaging materials are involved. Manufacturing components such as the mirror frame, storage compartments, and base from low-cost, non-sustainable materials not only contributes to increased production waste but also leads to higher environmental impact, as these materials often end up in landfills.

Furthermore, during the production process, cutting or shaping materials for the mirror's various components could generate scrap or leftover pieces, leading to material wastage if they are not repurposed or recycled. Another form of wastage can be found in the energy consumption during the production phase, especially in the LED light integration. If the LED systems are not optimized for energy efficiency, both in manufacturing and in end-user consumption, this can lead to increased power usage during production and throughout the product's lifespan, contributing to environmental waste.

Excessive packaging is another potential wastage issue. Mirrors, particularly those with fragile components like LED lights and adjustable parts, often require careful packaging to prevent damage during shipping. However, the use of bulky, non-recyclable packaging materials, such as Styrofoam, plastic wrap, and excessive cardboard, can lead to significant waste, particularly if these materials are not designed to be biodegradable or recyclable. Additionally, if the production line is inefficient or experiences frequent defects during assembly—such as faulty LED integration, poorly manufactured height adjustment mechanisms, or weak structural elements—this could lead to a high rate of product rejections, increasing wastage of both materials and labor resources.

Furthermore, poor inventory management could result in overproduction, leading to excess stock that may not be sold, eventually resulting in product waste. Finally, wastage also occurs when products with a short lifespan or limited durability are disposed of prematurely by consumers. If the mirror's adjustable mechanisms or LED lights fail early, users may discard the product rather than repairing it, adding to e-waste and contributing to environmental pollution. Addressing these potential wastage issues is critical to ensuring that the glam mirror is both cost-effective to produce and environmentally responsible, minimizing its ecological footprint while enhancing sustainability in the beauty and personal grooming industry.

2.2.2 BAD MATERIALS IN GLAM MIRROR

In the development of a glam mirror, there are several potential issues or "bad ingredients" that could negatively impact the product's quality, durability, and user satisfaction. One of the key concerns is the use of low-quality LED lights, which may result in flickering, uneven illumination, or even premature failure. Inconsistent lighting can distort the appearance of makeup or grooming results, making it difficult for users to achieve accurate results. Additionally, cheap LEDs can lack proper color accuracy, which is essential for makeup application under different lighting environments. Another issue arises from the use of fragile materials for the small storage compartments. If low-quality plastics or other brittle materials are used, the compartments could easily crack, wear down, or break after repeated use, diminishing the overall functionality of the mirror and frustrating users who rely on these compartments for organizing beauty products.

The stability of the standing base is another critical area of concern. A poorly designed or weak base could make the mirror prone to wobbling or tipping over, posing a safety risk, especially in homes with children or pets. Stability is crucial to ensure the mirror can be safely and conveniently used in various settings like bedrooms or bathrooms. In addition, the adjustable height mechanism must be carefully engineered for durability and smooth operation. If the adjustment system is made from subpar materials or designed poorly, it could easily become stiff, jam, or wear out over time, locking the mirror in one height position and negating the ergonomic benefits that flexible height is meant to provide.

Furthermore, using non-sustainable materials, such as non-recyclable plastics or environmentally harmful metals, not only contributes to environmental degradation but also diminishes the product's appeal to eco-conscious consumers who prioritize sustainability. If the mirror is not designed with recyclability or eco-friendly materials in mind, it could face backlash from a growing segment of the market that values environmentally responsible products. Additionally, poor energy efficiency in the LED system could lead to high power consumption, resulting in increased electricity costs for users and unnecessary environmental waste. Lastly, the use of suboptimal adhesives or manufacturing techniques could compromise the overall assembly of the mirror, making it prone to breakage or reducing its lifespan. All of these "bad ingredients" can severely detract from the user experience, decrease product longevity, and negatively impact the mirror's market performance. Therefore, careful consideration of materials, design, and sustainability is essential to produce a high-quality glam mirror that meets consumer expectations.

2.2.3 PROCESS OF PRODUCTION GLAM MIRROR

PROCESS OF GLAM MIRROR ARE MADE :-

2.3 DESIGN THINKING PROCESS

An empathic focus on end users is at the heart of the human-centered problem-solving method known as "design thinking." It is an active and iterative process that promotes originality and creativity. The major steps of the design thinking process as they relate to our project will be outlined in this section. The idea and practise of design thinking have developed over time; there is no single creator or originator. Instead, it has evolved over time as a result of the contributions made by diverse designers, scholars, and organisations. Design thinking process involved five phased which is Emphaty, Define, Ideate, Prototype and Test.

The process begins with the empathize stage, where the design team seeks to deeply understand the needs, frustrations, and desires of potential users. This is done through surveys, interviews, and direct observation, targeting individuals who regularly engage in beauty and grooming routines. Common issues identified during this phase include poor lighting in traditional mirrors, lack of convenient storage for beauty products, and the discomfort of using mirrors that are not height adjustable or easily portable. Armed with these insights, the team moves to the define phase, clearly outlining the key problems: users need a mirror that provides customizable lighting for different beauty scenarios, accessible storage to reduce clutter, and a flexible structure that adapts to different heights and spaces without compromising stability.

Next, the project enters the ideate stage, where brainstorming sessions generate creative solutions to these defined problems. The idea of incorporating LED lights emerges to address the lighting issue, allowing users to simulate different environments for accurate makeup application or grooming. The addition of small compartment storage directly within the mirror helps eliminate the need for additional vanity storage, streamlining the user's routine by keeping products within reach. The design team also considers a standing base to provide stability and mobility, allowing the mirror to be easily moved to different areas in a home, such as bedrooms or bathrooms. The final ideation involves adding flexible height adjustment, which ensures that the mirror can accommodate users whether they are sitting or standing, making it ergonomic and versatile for multiple users.

In the prototype stage, initial models of the glam mirror are created to test these features. These prototypes are refined based on user feedback gathered from testing sessions, ensuring that the LED lighting is easy to adjust, the storage compartments are spacious and durable, and the height adjustment mechanism is smooth and secure. Finally, in the test phase, users are invited to interact with the final prototype, providing valuable insights that lead to minor tweaks or improvements, such as optimizing the mirror's sturdiness, ensuring the LEDs are energy-efficient, and adjusting the storage layout for better usability. Through design thinking, the glam mirror evolves from a basic concept into a fully functional, innovative product that meets the real-world needs of beauty consumers, combining both style and practicality.

2.3.1 EMPATHY

Understanding the requirements, preferences, and viewpoints of the stakeholders or end users is the first step in the design thinking process. Methods like observations, questionnaires, and interviews are used to do this. In this stage, we try to learn as much as we can about the possibilities and problems that our project hopes to solve. To create solutions that actually appeal to the target audience, empathy is essential.

2.3.2 DEFINE

In this stage, we translate the empathize-phase insights into concise problem statements or design challenges. We identify the precise issues we hope to resolve while defining the project's goals and scope. This stage entails analysing data and formulating a precise issue statement that will serve as a road map for the remaining steps of the procedure.

2.3.3 IDEATE

Ideation is the stage of creative brainstorming where we produce a variety of potential answers to the specified issue. At this point, there is no such thing as a crazy or unrealistic concept. To promote a wide variety of ideas, strategies including brainstorming, mind mapping, and design workshops are employed. Exploring as many options as possible is the goal.

2.3.4 PROTOTYPE

This stage involves turning chosen concepts into physical prototypes or representations. Simple sketches, real-world models, or interactive digital mock-ups can all be used as prototypes. With the help of these prototypes, we can quickly test and improve our concepts. Low-cost, easily editable representations with low fidelity are what are intended.

2.3.5 TEST

Testing is a crucial phase where we get input on our prototypes from stakeholders or end users. This input enables us to enhance our designs and spot any flaws or potential areas for development. Because design thinking is iterative, we may go back to earlier phases and make changes in light of test results.

2.4 SUMMARY

Based on the description in Chapter 2, we can conclude that a large amount of data and analysis were gathered to strengthen the reason to produce this product. Most of the information gleaned from the design thinking process is similar.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

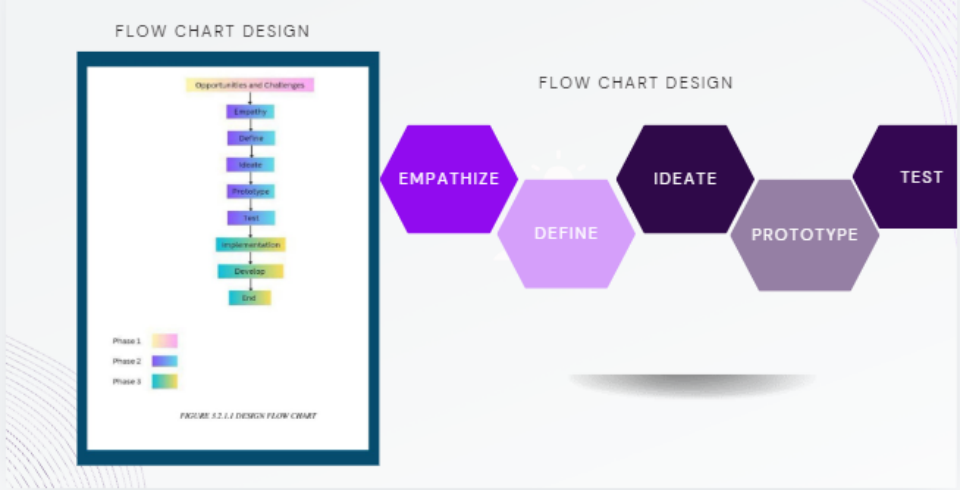
The Glam Mirror project will use design thinking to ensure the product meets the needs of college students. The key features—LED lighting, adjustable height, and storage—will be shaped by understanding how these aspects impact students' daily routines.

3.2 PROJECT DESIGN

The design and development of the GLAM MIRROR has concluded that using the Design Thinking Process as a framework is the most efficient course of action. The mirror will include these key features:

- Built-in LED lights: Adjustable brightness to ensure perfect lighting for tasks like makeup application and personal grooming.
- Adjustable height: The mirror's height can be easily changed to suit different activities, making it versatile for different needs.
- Compartment: A convenient storage area where students can keep small items like makeup, skincare products, or hair accessories, keeping everything organized and within reach.

3.2.1 FLOW CHART DESIGN



3.2.2 OPPORTUNITY AND CHALLENGES

OPPORTUNITY

The glam mirror with three LED color options, small compartment storage, a standing base, and flexible height adjustment presents several opportunities for growth and market penetration. One significant opportunity lies in the increasing consumer demand for innovative and multifunctional beauty products. With more people investing in beauty routines, this product caters to those looking for enhanced convenience, practicality, and style. The three LED color settings provide adjustable lighting that mimics different environments, which is ideal for makeup application, grooming, and other beauty routines. This feature gives the product a competitive edge, particularly for users who need precise lighting to achieve professional-level results at home. Additionally, the small compartment storage offers a practical solution for organizing beauty products, helping users maintain a clutter-free space, a feature that resonates with consumers looking for efficiency and ease of use. The mirror's standing base and flexible height adjustment make it versatile, appealing to a broader demographic who need a mirror that can adapt to different spaces and uses, whether for personal or shared environments.

CHALLENGES

Despite these opportunities, the glam mirror faces several challenges that must be addressed for it to succeed in the market. One major challenge is the cost of production, particularly with the incorporation of adjustable LED lighting and flexible height mechanisms, which could drive up the manufacturing costs.

This, in turn, might affect the retail price, potentially making it less accessible to a wider audience. Furthermore, ensuring the durability of the height adjustment and storage compartments is critical, as these are key functional features that must withstand daily use without breaking or becoming unreliable. There's also the challenge of market differentiation. The beauty industry is saturated with various types of mirrors, some from well-established brands. As a result, the glam mirror must clearly communicate its unique value proposition to stand out from competitors. Another concern is the energy efficiency of the LED lighting. If the lights consume too much power or are not energy-efficient, it could dissuade environmentally conscious consumers. Additionally, balancing aesthetic appeal with functionality is important, as consumers in the beauty market are drawn to products that look stylish while still delivering practical benefits. Addressing these challenges will be crucial in ensuring the product's long-term success and appeal to consumers.

3.3 METHOD/PROCEDURE/PROJECT PRODUCTION TECHNIQUE

The Glam Mirror project will follow the design thinking approach, focusing on the following steps:

1. Empathy: Through interviews and surveys, we'll learn about the challenges students face when it comes to daily routines—things like poor lighting or awkward mirror positions. This will guide the design.

2. Define: Based on the feedback, we'll identify the main problems, such as the need for better lighting and a more portable mirror with storage.

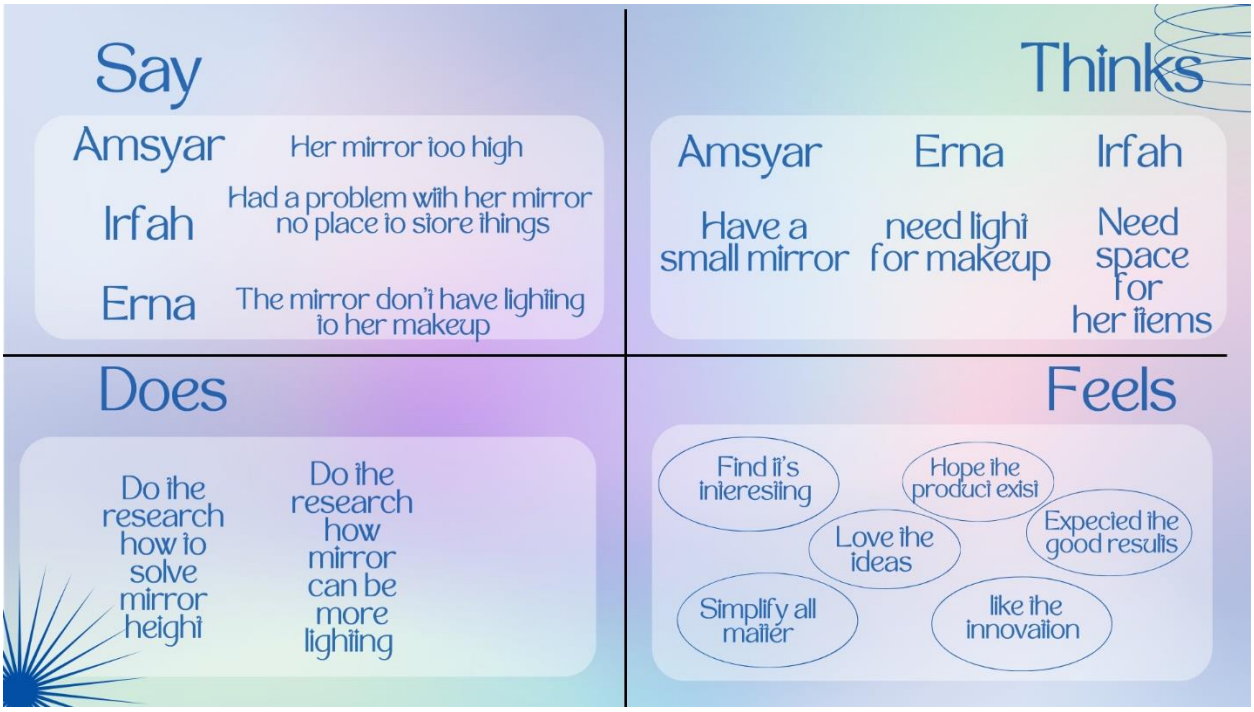
3. Ideate: We'll brainstorm solutions, like adding adjustable LED lights, a mechanism to adjust the height, and a built-in compartment.

4. Prototype: A working prototype of the Glam Mirror will be created with these features and tested by students to see how well it works.

5. Test: The prototype will be evaluated for its ease of use, durability, and effectiveness, and student feedback will be used to improve the product.

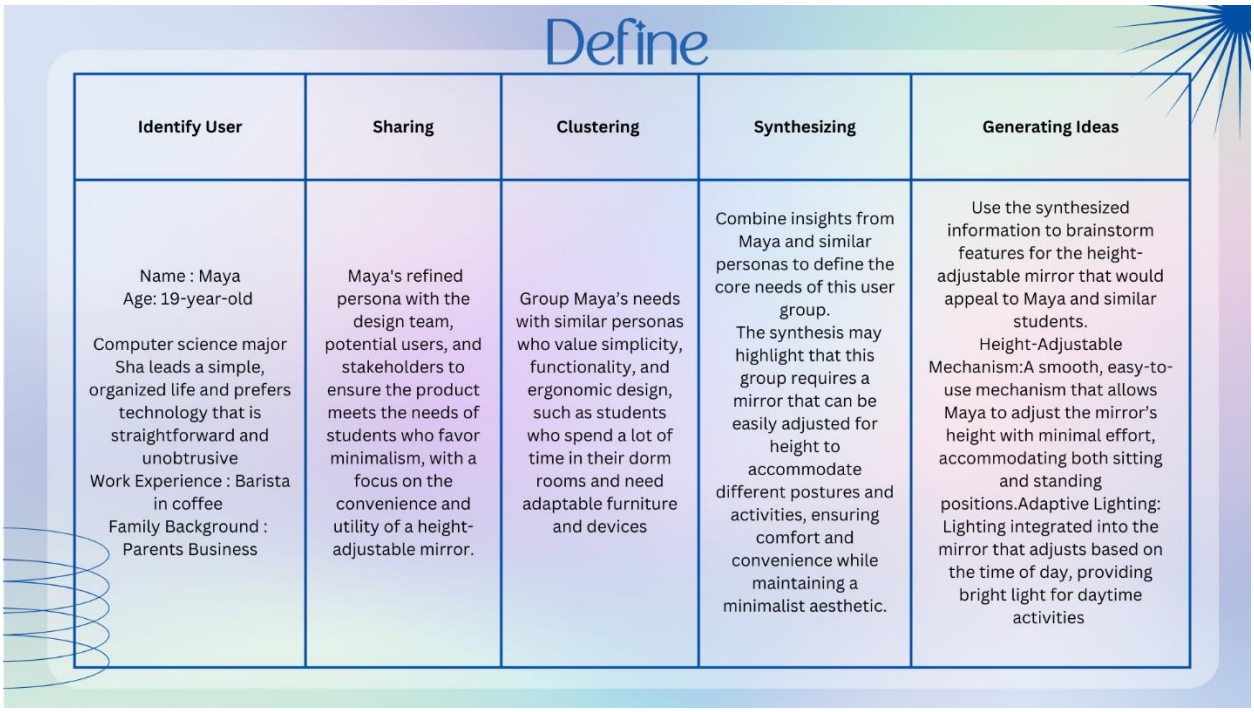
3.3.1 EMPATHY

What is empathy? Empathy is the ability to understand and share the feelings of others. It's about putting yourself in someone else's shoes and being able to connect with their emotions and experiences. When you have empathy, you can show compassion, support, and understanding towards others. Students at Sultan Salahuddin Abdul Aziz Shah Polytechnic were questioned and given questionnaires in an effort to promote empathy. Surveys and interviews revealed that some individuals doesn't like the traditional mirror features.



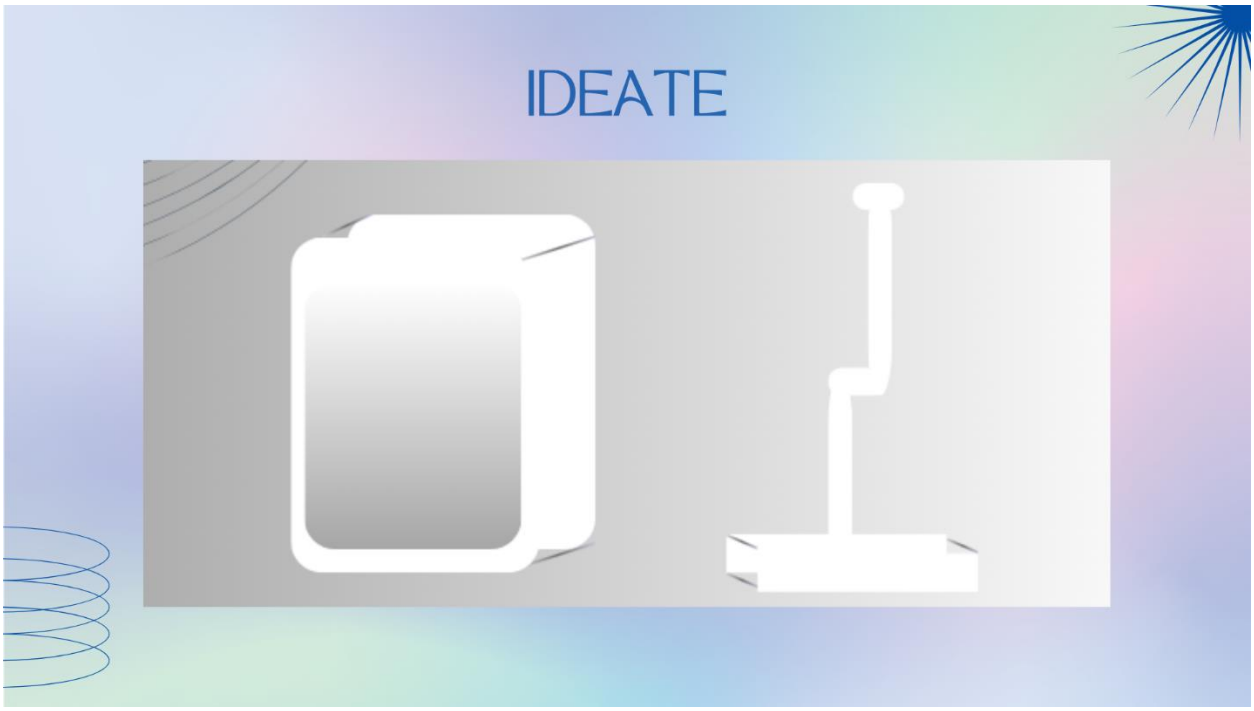
3.3.2 DEFINE

Once empathy has been developed, we compile all the data from Polytechnic Sultan Salahuddin Abdul Aziz Shah, Shah Alam students.



3.3.3 IDEATE

Following a thorough description of the problems the customer was experiencing, we lead brainstorming sessions with multidisciplinary teams to produce original ideas and viable fixes for the identified issue. Promote the use of divergent thinking to investigate a variety of options, taking into account both technical and non-technological interventions.Ideas are ranked in order of likelihood, significance, and fit with the goals of the project and the needs of the users.



3.3.4 PROTOTYPE

After shortlisting our ideas, we brought them to life by developing a prototype. We made a sketch using a 3D Website from Vectary.com 3D design for our product. We already design the front view and back view of our product.

Prototype


Colour : White

3.4 MATERIALS AND EQUIPMENT

LIST OF MATERIALS	PICTURES	EXPLANATION
Mirror		Mirror is the base material needed to create the ideation of Glam Mirror.
Plywood		Pros of using Plywood Pros: • Strength and durability • Affordable price • Ease of Cutting and Shaping • Stability • Versatility
Fasteners		A hardware device that mechanically joins or affixes two or more objects together. In general, fasteners are used to create non-permanent joints; that is, joints that can be removed or dismantled without damaging the joining components.

LED lights		The light-emitting diode (LED) is today's most energy-efficient and rapidly developing lighting technology. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting.

3.5 METHOD OF COLLECTING DATA

The data we obtained for this project was collected by students, lecturers and employees at Polytechnic Sultan Salahuddin Abdul Aziz Shah. We collected data using a questionnaire technique that was distributed to respondents. This questionnaire is in the form of a Google form. Therefore, we will distribute it using the link provided.

Link google form:-

GLAM MIRROR SURVEY

3.6 SUMMARY

The design thinking methodology for the innovation of Glam Mirror begins with the empathize stage. This involves understanding the needs and pain points of potential users. Many consumers struggle with fixed-height mirrors that do not cater to different user heights, inadequate lighting that hampers visibility, and a lack of integrated storage. Additionally, with growing awareness about environmental sustainability, there is a demand for eco-friendly products that are both functional and stylish.

In the define stage, the problem is clearly articulated: conventional mirrors are often inconvenient due to their fixed height, poor lighting, and absence of storage options. Furthermore, they do not always align with consumers' desire for sustainable and aesthetically pleasing home items. The goal is to address these issues by designing a mirror that combines functionality, sustainability, and visual appeal.

During the ideate phase, brainstorming leads to the development of a concept for an adjustable height mirror equipped with LED lights to provide optimal illumination, compartmentalized storage to help users organize small items, and eco-friendly materials for sustainability. The product also aims to be visually striking, appealing to consumers looking for stylish additions to their living spaces.

In the prototype stage, a physical model of the mirror is created. The adjustable mechanism is tested for ease of use, LED lighting is integrated to ensure energy efficiency and proper brightness, and compartments are designed to enhance usability. Eco-friendly materials are incorporated to align with the product’s sustainability goals. The prototype is designed with a modern aesthetic to make the product visually attractive.

Finally, in the test stage, feedback is gathered from users interacting with the prototype. This feedback helps evaluate the mirror's functionality, durability, and user satisfaction. The insights gained from this phase are used to make iterative improvements to ensure the product not only meets users' needs but also delivers on its promise of being sustainable, functional, and aesthetically appealing.

CHAPTER 4

RESULT AND DISCUSSION

4.1 INTRODUCTION

This chapter will discuss the analysis of data that has been carried out for this project. The layout of this chapter is divided into several subtopics that illustrate the method of analysis for the project. This section will explain the detailed results from the testing and surveys conducted.

4.2 SAMPLE AND PROFILE

4.2.1 TESTING

Feedback greed

WHAT WORKED:	**WHAT COULD BE IMPROVED:**
• The LED lighting feature provides adequate illumination for tasks like makeup application and studying. • The compact design with a built-in storage compartment enhances functionality and convenience for small spaces. • The mirror is lightweight and portable, making it ideal for college students on the move. • Its sleek, modern aesthetic appeals to the target audience.	• Visible glue stains on the storage compartment detract from the overall build quality. • The removal of the height-adjustable feature reduces versatility for users of different heights. • The durability of materials used for the storage compartment could be enhanced for long-term use. • Sustainability aspects, such as eco-friendly materials, need more focus to attract environmentally conscious buyers.
NEW QUESTIONS:	**NEW IDEAS:**
• Are the LED lights energy-efficient and safe for prolonged use? • Is the mirror surface resistant to scratches or other damage? • What is the expected lifespan of the product, including the LED lights? • Could the product be disassembled for recycling or repair?	• Reintroduce the height-adjustable feature using a cost-effective mechanism. • Offer multiple color options or finishes to cater to diverse aesthetic preferences. • Develop a modular design where storage compartments can be customized or expanded. • Include user-friendly assembly instructions to enhance accessibility. • Use recyclable or biodegradable packaging to align with sustainability goals.

Sample and profile is the characteristics of the individuals included in your research study. It comprises all of the information related with the respondent. The information such as age, gender and occupation. It is important to study the population. Table and pie chart below shows the result and percentage of the survey.

Gender	Male Female	50% 50%
Age	18 - 24 year old 25 - 34 year old 35 - 44 year old 45 & Above	84% 12% 4% -
Occupation	Students Employed Full-Time Employed Part-Time Unemployed	74% 22% - -

(Total Respondents 50 respondents)

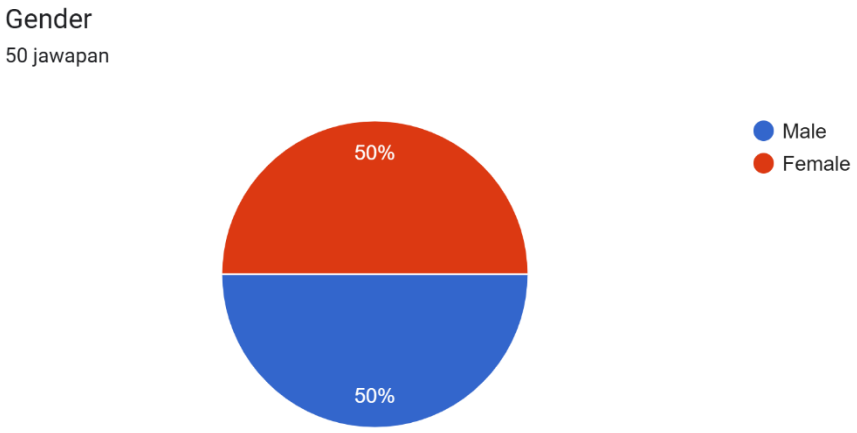


Figure 4.1.1 : Gender

In conclusion, the questionnaire received responses from a balanced demographic in terms of gender, comprising an equal split of 50% male and 50% female participants. The total number of respondents was 50, ensuring a fair representation of both genders. This balanced participation provides a well-rounded perspective in the analysis, contributing to the reliability and inclusiveness of the results drawn from the survey.

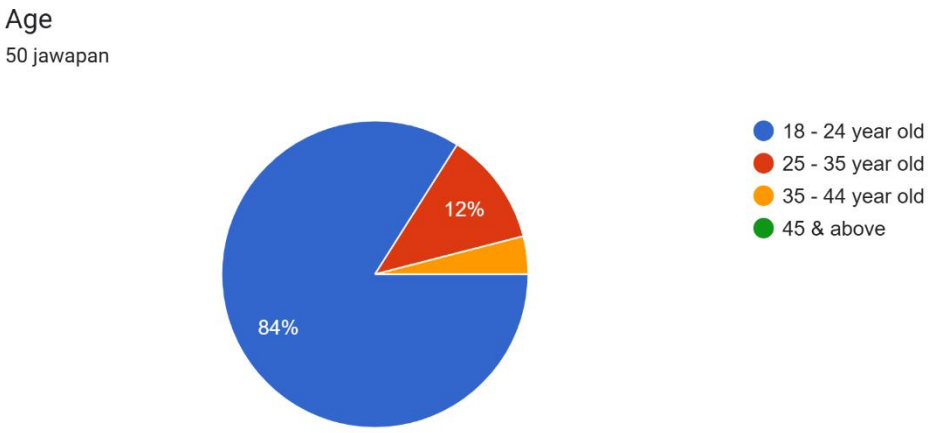


Figure 4.1.2 : Age

The age distribution of respondents indicates that the majority, 84%, are within the age range of 18 to 24 years old. Respondents aged between 25 to 34 years old account for 12%, while those aged between 35 to 44 years old represent 4% of the total. This age profile highlights that the primary input comes from a younger demographic, which may influence the insights and trends observed in the survey result.

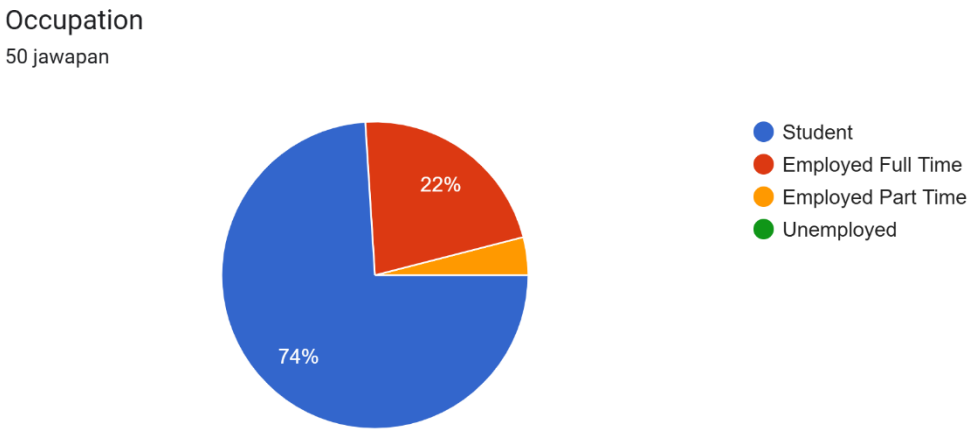


Figure 4.1.3 : Occupation

The occupation profile of the respondents further shows that 74% are students, 22% are employed full-time, and 4% are employed part-time. This distribution underscores that the feedback primarily reflects the perspectives of students, with additional input from working individuals, providing a comprehensive understanding of varying viewpoints within the surveyed group.

POST-SURVEY:

QUESTION	RESPONDENT ANSWER	FREQUENCY	PERCENTAGE
Do you currently have a mirror in your home?	Yes No	50 -	100%
Have you experienced any issues or challenges with your current mirror? (e.g., lack of adjustable height, poor lighting, insufficient storage)	Yes No	49 1	98% 2%
Would you be interested in a mirror that offers adjustable height, built-in LED lighting, and smart compartmentalization made from eco-friendly materials?	Yes No	50 -	100%
I would like to purchase an adjustable LED mirror with eco-friendly features if it is available.	Strongly agree Agree Neutral Disagree Strongly disagree	35 10 5	70% 20% 10%
I prefer buying innovative products, like the Glam Mirror.	Strongly agree Agree Neutral Disagree Strongly disagree	37 11 2	74% 22% 4%
I believe a mirror with LED lights, adjustable height, and compartmentalization is necessary for personal use.	Strongly agree Agree Neutral Disagree Strongly disagree	36 12 2	72% 24% 4%

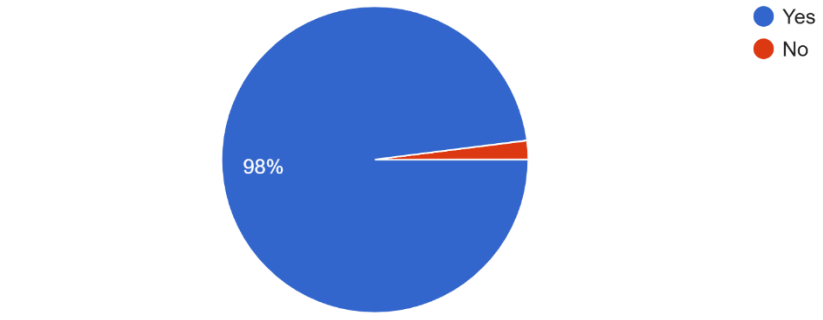
I tend to prioritize product functionality and sustainability over aesthetics when making a purchase decision.	Strongly agree Agree Neutral Disagree Strongly disagree	39 7 4	78% 14% 8%
I plan to purchase the Glam Mirror one day.	Strongly agree Agree Neutral Disagree Strongly disagree	37 11 2	74% 22% 4%
I believe an adjustable LED mirror with eco-friendly features offers good value for the price.	Strongly agree Agree Neutral Disagree Strongly disagree	36 11 3	72% 22% 6%
The combination of adjustable height, LED lighting, and storage compartments would make this mirror feel like a worthwhile investment.	Strongly agree Agree Neutral Disagree Strongly disagree	32 15 3	64% 30% 6%
I perceive mirrors made from eco-friendly materials as higher value products compared to those made from conventional materials.	Strongly agree Agree Neutral Disagree Strongly disagree	34 10 6	68% 20% 12%
I would be willing to pay a premium price for a mirror that is both functional and eco-friendly.	Strongly agree Agree Neutral Disagree Strongly disagree	31 13 6	62% 26% 12%

I believe that a product's sustainability contributes significantly to its overall value.	Strongly agree Agree Neutral Disagree Strongly disagree	37 9 4	74% 18% 8%
I am open to trying new, innovative products like an adjustable LED mirror with eco-friendly features.	Strongly agree Agree Neutral Disagree Strongly disagree	36 11 3	72% 22% 6%
I tend to seek out and purchase products that incorporate the latest technology or innovative features.	Strongly agree Agree Neutral Disagree Strongly disagree	33 12 3	66% 24% 6%
I am excited about the idea of a mirror that combines multiple functions, such as adjustable height, LED lighting, and storage compartments.	Strongly agree Agree Neutral Disagree Strongly disagree	34 11 5	68% 22% 10%
I am willing to try a new product if it promises to solve common problems I face with traditional mirrors.	Strongly agree Agree Neutral Disagree Strongly disagree	33 11 6	66% 22% 12%
I believe that innovative products, such as an eco-friendly adjustable LED mirror, are more likely to improve my daily life.	Strongly agree Agree Neutral Disagree Strongly disagree	29 15 6	58% 30% 12%

QUESTION 1

The figures show that every respondent (100% of the respondents) has a personal mirror in their home.

QUESTION 2

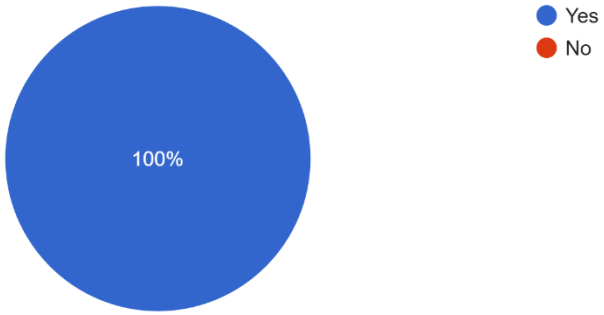


The figures show that 98% of the respondents experienced issues or challenges with their current mirror such as lack of adjustable height, poor lighting, and insufficient storage. There are 2% of the respondents didn't experience challenges with traditional mirror.

QUESTION 3

Would you be interested in a mirror that offers adjustable height, built-in LED lighting, and smart compartmentalization made from eco-friendly mate...intar yang diperbuat daripada bahan mesra alam?

50 jawapan

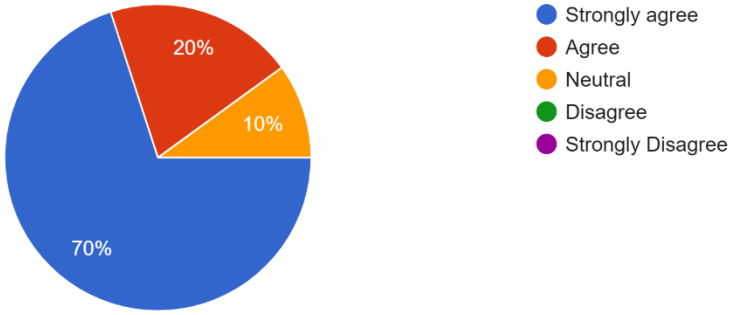


The figures show that the respondents are interested in a mirror that offers adjustable height, built-in LED lighting, and smart compartmentalization made from eco-friendly materials.

QUESTION 4

I would like to purchase an adjustable LED mirror with eco-friendly features if it is available. Saya ingin membeli cermin LED boleh laras dengan ciri mesra alam jika ia tersedia.

50 jawapan

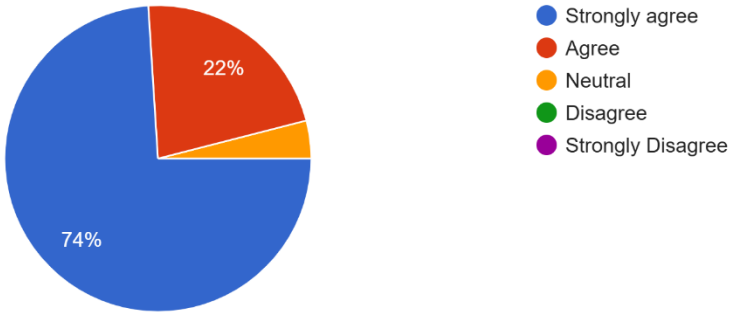


The majority of respondents (90%) showed a positive interest in purchasing an LED mirror, with 70% strongly agreeing and 20% agreeing, while only 10% remained neutral. This suggests a strong market potential for the product.

QUESTION 5

I prefer buying innovative products, like the Glam Mirror. Saya lebih suka membeli produk inovatif, seperti Glam Mirror.

50 jawapan

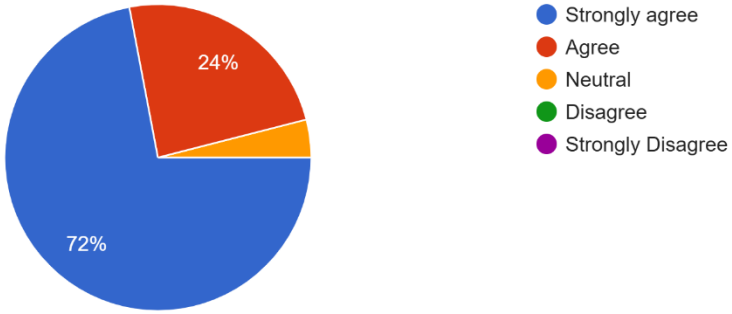


Figures show that 74% of the respondents strongly agree that they prefer buying innovative products, 22% of the respondents agree, and 4% voted neutral about it. The majority (96% of the respondents) is positive to purchase innovative product.

QUESTION 6

I believe a mirror with LED lights, adjustable height, and compartmentalization is necessary for personal use. Saya percaya cermin dengan lampu L...mbahagian adalah perlu untuk kegunaan peribadi.

50 jawapan

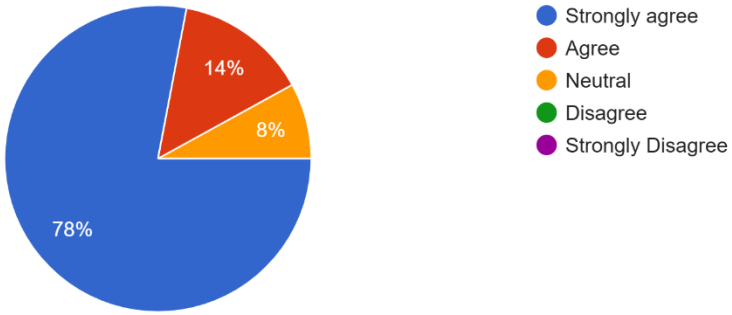


Figures show that 72% of the respondents strongly agree that a mirror with innovative features is necessary for personal use, 24% of them voted to agree, and 4% voted for neutral.

QUESTION 7

I tend to prioritize product functionality and sustainability over aesthetics when making a purchase decision. Saya cenderung untuk mengutamakan fu... estetika semasa membuat keputusan pembelian.

50 jawapan

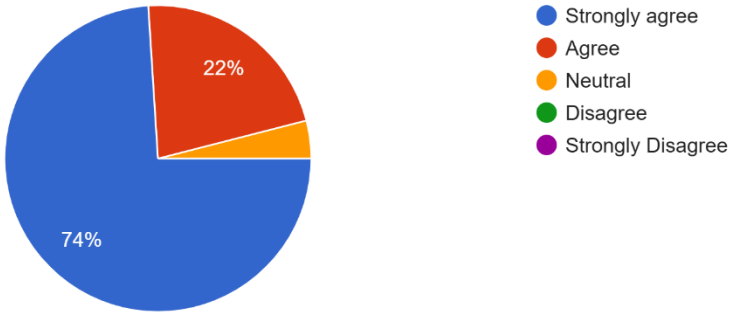


Figures show that 78% of the respondents strongly agree to prioritize functionality and sustainability over aesthetics when making a purchase decision, 14% of them voted to agree, and 8% voted neutral.

QUESTION 8

I plan to purchase the Glam Mirror one day. Saya bercadang untuk membeli Glam Mirror suatu hari nanti.

50 jawapan

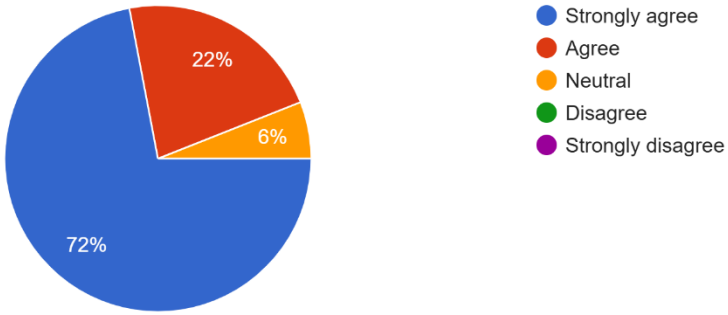


Figures show that 74% of the respondents planned to purchase the Glam mirror one day, 22% voted to agree and 4% voted neutral.

QUESTION 9

I believe an adjustable LED mirror with eco-friendly features offers good value for the price. Saya percaya cermin LED boleh laras dengan ciri mesra alam menawarkan nilai yang baik untuk harga.

50 jawapan

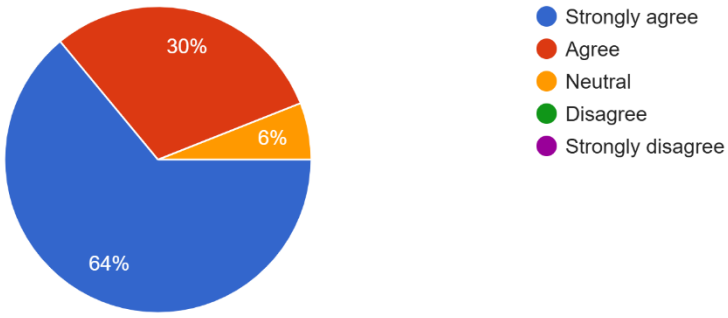


Figures show that 72% of the respondents strongly agreed that mirrors with innovative features offer good value for the price, 22% voted to agree and 6% voted to neutral.

QUESTION 10

The combination of adjustable height, LED lighting, and storage compartments would make this mirror feel like a worthwhile investment. Gabunga... cermin ini berasa seperti pelaburan yang berbaloi.

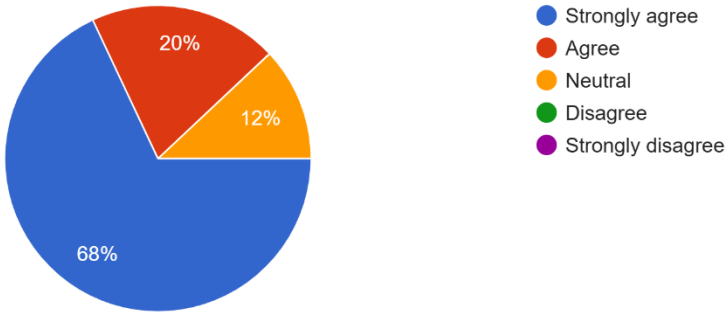
50 jawapan



Figures show that 64% voted to strongly agree that they feel the innovative mirror is a worthwhile investment, 30% voted to agree and 6% voted to neutral.

QUESTION 11

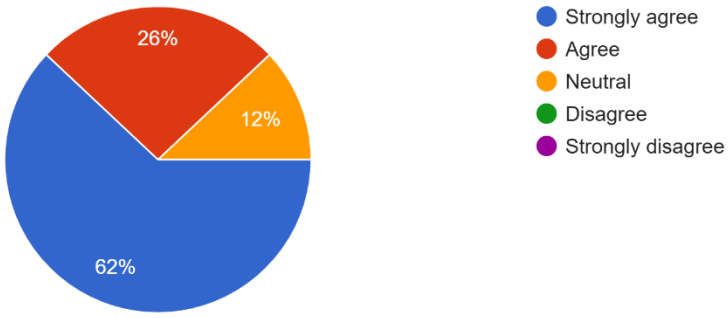
I perceive mirrors made from eco-friendly materials as higher value products compared to those made from conventional materials. Saya mengang...min yang diperbuat daripada bahan konvensional.
50 jawapan



Figures show that 68% of the respondents strongly agree and perceived that eco-friendly materials have more value than conventional materials, 20% voted to agree and 12% voted to neutral.

QUESTION 12

I would be willing to pay a premium price for a mirror that is both functional and eco-friendly. Saya sanggup membayar harga premium untuk cermin yang berfungsi dan mesra alam.
50 jawapan

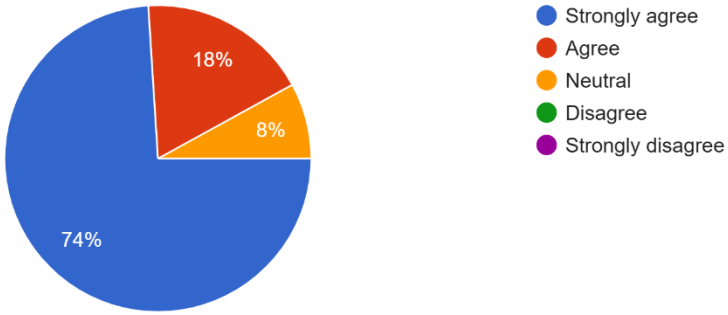


Figures show that 62% of the respondents strongly agreed that they would be willing to pay premium price for a mirror that is functional and eco-friendly, 26% voted to agree and 12% voted to neutral. This shows that consumers prefer qualities over the actual price.

QUESTION 13

I believe that a product's sustainability contributes significantly to its overall value. Saya percaya bahawa kemampanan produk menyumbang dengan ketara kepada nilai keseluruhannya.

50 jawapan

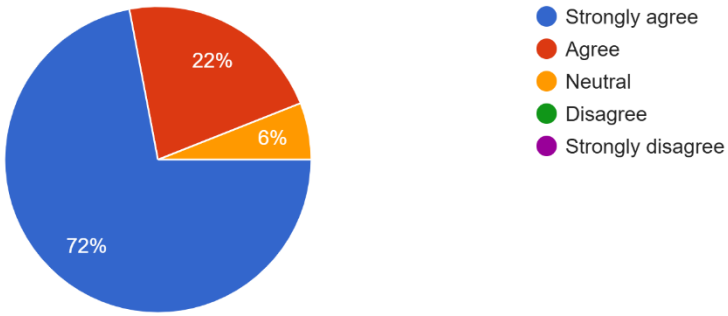


Figures show that 74% of the respondents strongly agree that they believed that a product's sustainability contributes significantly to its overall value, 18% voted to agree and 8% voted to neutral.

QUESTION 14

I am open to trying new, innovative products like an adjustable LED mirror with eco-friendly features. Saya terbuka untuk mencuba produk bahar...i cermin LED boleh laras dengan ciri mesra alam.

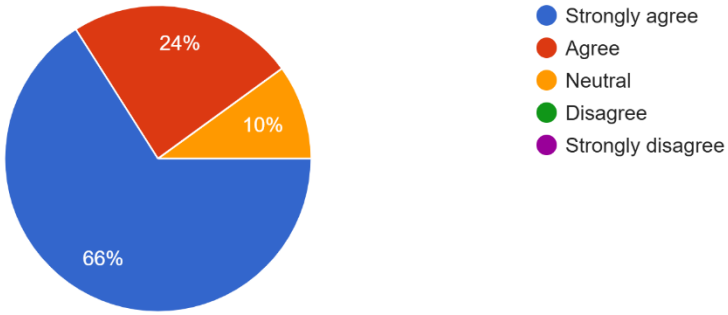
50 jawapan



Figures show that 72% of the respondents strongly agree that they are open to trying new and innovative products like the Glam Mirror, 22% voted agree and 6% voted neutral.

QUESTION 15

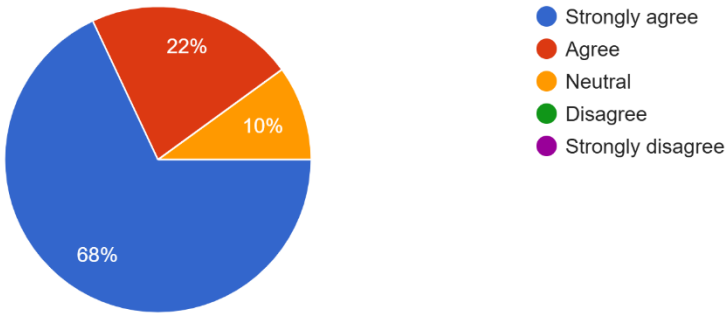
I tend to seek out and purchase products that incorporate the latest technology or innovative features. Saya cenderung untuk mencari dan membeli...nggabungkan teknologi terkini atau ciri inovatif.
50 jawapan



Figures show that 66% of the respondents strongly agree that they tend to seek out and purchase products comes in the latest technology and innovative features, 24% voted agree and 10% voted neutral.

QUESTION 16

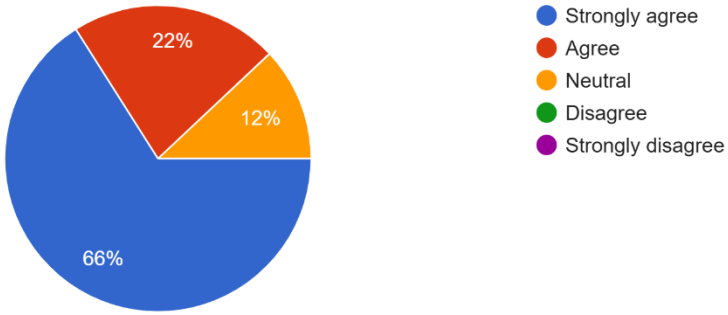
I am excited about the idea of a mirror that combines multiple functions, such as adjustable height, LED lighting, and storage compartments. Saya ter...an boleh laras, pencahayaan LED dan petak storan.
50 jawapan



Figures show that 68% of the respondents feel excited about the idea of a mirror that comes with innovative features, 22% voted agree and 10% voted neutral.

QUESTION 17

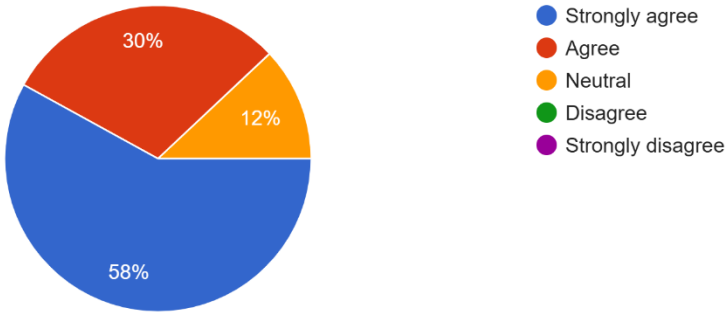
I am willing to try a new product if it promises to solve common problems I face with traditional mirrors. Saya bersedia untuk mencuba produk bar...biasa yang saya hadapi dengan cermin tradisional.
50 jawapan



Figures show that 66% of the respondents strongly agree that they are willing to try new innovations of a mirror that could solve the challenges they faced with traditional mirrors, 22% voted agree and 12% voted neutral.

QUESTION 18

I believe that innovative products, such as an eco-friendly adjustable LED mirror, are more likely to improve my daily life. Saya percaya bahawa pro...rkemungkinan meningkatkan kehidupan harian saya.
50 jawapan



Figures show that 58% of the respondents strongly agree that the innovative products could improve their life, 30% voted agree and 12% voted neutral.

4.3 RELIABILITY AND MEASUREMENT

Cronbach's Alpha is used to determine reliability and to measure the consistency of each item in the instruments. The dimensions of each question were chosen separately to aid in comprehension. the measurement device's consistency using dependability analysis. The concept of measure dependability relates to the degree of stability with which the instrument applies the idea and allows the assessment of a measure's quality.

NUMBER OF ITEM	NUMBER OF ITEM DISCARD	Cronbach's Alpha
18	-	0.792

Table above shows the result of Cronbach's Alpha. It shows that the result is in a good level because it achieved above 0.7. The result of our project which is Glam Mirror do achieved 0.792 for the least and others is above it. By this, it means that our project result is at a good level.

4.4 DESCRIPTIVE ANALYSIS

Purchase Intention

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PI1	50	3	5	4.60	.670
PI2	50	3	5	4.70	.544
PI3	50	3	5	4.68	.551
PI4	50	3	5	4.68	.551
PI5	50	3	5	4.70	.544
Valid N (listwise)	50				

Items	Mean	Standard deviation
I would like to purchase an adjustable LED mirror with eco-friendly features if it is available.	4.60	.670
I prefer buying innovative products like the Glam Mirror.	4.70	.544
I believe a mirror with LED lights, adjustable height, and compartmentalization is necessary for personal use.	4.68	.551
I tend to prioritize product functionality and sustainability over aesthetics when making a purchase decision.	4.68	.551
I plan to purchase the Glam Mirror one day.	4.70	.544

Perceived Value

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PV1	50	3	5	4.68	.587
PV2	50	3	5	4.58	.609
PV3	50	3	5	4.56	.705
PV4	50	3	5	4.54	.676
PV5	50	3	5	4.66	.626
Valid N (listwise)	50				

Item	Mean	Standard deviation
I believe an adjustable LED mirror with eco-friendly features offers good value for the price.	4.68	.587
The combination of adjustable height, LED lighting, and storage compartments would make this mirror feel like a worthwhile investment.	4.58	.609
I perceive mirrors made from eco-friendly materials as higher value products compared to those made from conventional materials.	4.56	.705
I would be willing to pay a premium price for a mirror that is both functional and eco-friendly.	4.54	.676
I believe that a product's sustainability contributes significantly to its overall value.	4.66	.626

Consumer Innovativeness

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CI1	50	3	5	4.66	.593
CI2	50	3	5	4.56	.675
CI3	50	3	5	4.58	.673
CI4	50	3	5	4.54	.706
CI5	50	3	5	4.46	.706
Valid N (listwise)	50				

Item	Mean	Standard deviation
I am open to trying new, innovative products like an adjustable LED mirror with eco-friendly features.	4.66	.593
I tend to seek out and purchase products that incorporate the latest technology or innovative features.	4.56	.675
I am excited about the idea of a mirror that combines multiple functions, such as adjustable height, LED lighting, and storage compartments.	4.58	.673
I am willing to try a new product if it promises to solve common problems I face with traditional mirrors.	4.54	.706
I believe that innovative products, such as an eco-friendly adjustable LED mirror, are more likely to improve my daily life.	4.46	.706

SPSS ANALYSIS RESPONDENT

The Glam Mirror offers crucial statistical data for analysis and decision-making that enhances work achievement. The tables above show that PI2 and PI5 have the highest mean score which is 4.70. At PI2 it said, “I prefer buying innovative products like the Glam Mirror.” And at PI5 it is said that “I plan to purchase the Glam Mirror one day.”. The standard deviation for both PI2 and PI5 are 0.544 which means the data are clustered closely with the mean and it is more reliable. For the lowest mean, it shows that CI5 has the lowest mean which is 4.46. The question is “I believe that innovative products, such as an eco-friendly adjustable LED mirror, are more likely to improve my daily life. ”. The standard deviation for CI5 is 0.706. Even if it is the lowest, it is still reliable because the value is above 0.7.

4.5 SUMMARY

According on the responses that we obtained from distributed surveys, students at Sultan Salahuddin Abdul Aziz Shah's Polytechnic comprised the respondents. The majority of responders to our data analysis using SPSS expressed satisfaction with our product, the Glam Mirror. It proves that the Glam Mirror's goal is to reduce the burden for the consumer has been effectively achieved.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The Glam Mirror was created as a versatile and practical accessory designed to meet the needs of college students. It features built-in LED lighting and a wooden storage compartment, making it both functional and stylish. However, during the development process, some challenges emerged, such as visible glue stains on the compartment. This section provides recommendations for improvement, discusses the limitations of the project, and summarizes the findings.

5.2 CONCLUSION

The Glam Mirror project has successfully introduced a practical and stylish solution tailored for college students, combining functionality and aesthetics through its integrated LED lighting and wooden storage compartment. Despite its innovative concept, the development process highlighted several areas for improvement, such as visible glue marks, the removal of the height-adjustable feature, and the use of less durable materials due to budget constraints. These challenges, along with limited user feedback and time constraints, have restricted the current design's potential.

However, the recommendations provided such as improving build quality, reintroducing height adjustment, using higher quality materials, prioritizing sustainability, and incorporating user feedback serve as a roadmap for refining the product. By addressing these areas and adopting a more user centered and eco conscious approach, the Glam Mirror can be further developed into a durable, functional, and environmentally friendly accessory that meets the diverse needs of its target audience. Ultimately, the project lays a strong foundation for future advancements and highlights the importance of iterative design and sustainable practices in product development.

5.3 RECOMMENDATIONS

To ensure the continued success and growth of our product, ongoing research and development should focus on several key areas. focus should be enhanced functionality. By gathering user feedback through surveys and usability customers , we can identify opportunities to improve product design and features. Integrating advanced technologies, such as smart connectivity or energy-efficient components, can elevate user experience and differentiate our product from competitors. Cost optimization also remains a priority for ensuring broader market access. Research into cost-effective manufacturing methods and streamlined supply chain management will enable us to produce high-quality products at competitive prices, making them more appealing to diverse customer segments.

To improve stand mirrors and mirrors in general, several enhancements can be made. First, integrating smart technology like adjustable LED lighting, Bluetooth speakers, and touchscreen controls can enhance user experience. Adding features like height adjustment, tilting, and swivel options makes mirrors more flexible and user-friendly. Incorporating magnification on one side and energy-efficient LED lighting improves functionality. Using eco-friendly materials, such as recycled aluminum or bamboo, and offering rechargeable or solar-powered options promotes sustainability. Customizable frames, foldable designs, and compact options cater to different preferences and spaces. Anti-fog, anti-scratch coatings, Finally, adding voice assistant integration and AI-powered beauty tips provides a more interactive and personalized experience. These updates can make mirrors more practical, stylish, and environmentally conscious.

Additionally, aesthetic customization offers significant potential for market expansion. By introducing modular or customizable options, we can cater to varied customer preferences and target niche markets that value personalization. This strategy not only increases appeal but also enhances customer loyalty. Expanding into new markets is another vital recommendation. Market research should focus on understanding trends and customer behaviors in untapped regions, allowing us to adapt our strategies and offerings to suit different demographics effectively. This approach will position us for sustained growth and increased market share.Finally, implementing systems to monitor sustainability metrics is essential. Measuring the environmental impact of our product throughout its lifecycle will provide valuable insights for further eco-efficiency improvements. This transparency can also help us maintain compliance with green certifications and appeal to environmentally conscious consumers. By focusing on these areas, we can ensure that our product continues to evolve, meeting both customer needs and environmental responsibilities. These recommendations will help us solidify our position as a leader in innovative and sustainable product development.

5.4 LIMITATIONS OF THE STUDY

One limitation is the scope of market analysis. Due to constraints in time and resources, the research primarily focused on a specific demographic and geographic region. This limited scope may not fully capture broader market trends or the needs of diverse customer segments. Expanding the research base in future studies could provide a more comprehensive understanding of potential market opportunities.

Another challenge was the availability of sustainable materials. While the project emphasized eco-friendly components, sourcing these materials proved to be limited and sometimes cost-prohibitive. This restriction influenced certain design and production decisions. Further exploration of affordable, sustainable alternatives will be crucial for scalability.

The project was also affected by budgetary and resource constraints. These limitations impacted the depth of prototyping, testing, and refinement processes. As a result, there may be undiscovered areas for optimization, especially in durability and advanced functionality.

Additionally, user feedback was gathered from a relatively small sample size. While the insights were valuable, they may not fully represent the diverse preferences of a wider audience. Expanding feedback collection efforts in future iterations will enhance the product's inclusivity and adaptability.

Finally, the implementation of advanced technologies was limited due to technical expertise and funding constraints. Although potential features like smart integration or IoT compatibility were considered, they could not be fully developed or incorporated at this stage.

5.5 SUMMARY

Our business project was designed to develop an innovative and sustainable product that addresses modern consumer needs while aligning with environmental goals. By combining creativity, eco-conscious materials, and functional design, we successfully introduced a product that not only enhances daily convenience but also promotes sustainability.

Throughout the project, we conducted comprehensive market research to understand customer demands and trends, enabling us to design a solution that balances practicality and aesthetics. The product integrates features such as eco-friendly materials, energy-efficient components, and customizable options to appeal to a wide range of users.

In addition to product development, we focused on operational strategies that minimize costs while maintaining quality. By incorporating recycled materials and exploring efficient manufacturing methods, we demonstrated that sustainability and affordability can coexist. Our marketing efforts emphasized the product's environmental benefits and unique value proposition, fostering strong customer interest and awareness.

Despite certain limitations, including resource constraints and the need for expanded market testing, the project achieved its primary goals. It also provided valuable insights into consumer behavior, supply chain management, and the potential for growth in the sustainable product market.

Overall, this project not only validated our concept but also highlighted the importance of innovation and adaptability in today's competitive landscape. It serves as a stepping stone for future advancements and reflects our commitment to delivering impactful, customer-focused solutions that contribute to a greener future.

REFERENCES
APA CITATION STYLE

Makes and Munchies

Makes and Munchies. (n.d.). DIY Vanity Mirror With Lights. Retrieved from https://makesandmunchies.com/diy-vanity-mirror-with-lights/

Happy DIY Home

Happy DIY Home. (n.d.). DIY Vanity Mirror. Retrieved from

https://happydiyhome.com/diy-vanity-mirror/

Decor Snob

Decor Snob. (n.d.). Lighted Vanity Mirror. Retrieved from https://www.decorsnob.com/lighted-vanity-mirror/

Instructables

Instructables. (n.d.). Modern Wood and LED Vanity Mirror. Retrieved from https://www.instructables.com/Modern-Wood-and-LED-Vanity-Mirror/

Oh Me Oh My Blog

Oh Me Oh My Blog. (n.d.). Glam DIY Lighted Vanity Mirrors. Retrieved from https://www.ohmeohmyblog.com/glam-diy-lighted-vanity-mirrors/

Remodel or Move

Remodel or Move. (n.d.). DIY Vanity Mirror Ideas. Retrieved from https://www.remodelormove.com/diy-vanity-mirror-ideas/

Design Asylum Blog

Design Asylum Blog. (n.d.). DIY Rustic Hollywood Mirror. Retrieved from https://designasylumblog.com/diy-rustic-hollywood-mirror/

PROJECT GANTT CHART

TASK	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13	WEEK 14
Final Project Briefing (Discuss what project we choose)														
Meeting with Supervisor														
Logbook														
Meeting with Supervisor														
Logbook														
Meeting with Supervisor														
Logbook														
Report Writing Proposal on Chapter 1														
Create an idea of the product, make research														
Meeting with Supervisor														
Logbook														
Search the product materials and equipment														
Report Writing Proposal on Chapter 2														
Meeting with Supervisor														
Logbook														
Continue the Report Writing Proposal on Chapter 2														
Meeting with Supervisor														
Logbook														
Presentation on Proposal														
Continue to the new chapter 3 methodology of Report Writing														
Meeting with supervisor														
Logbook														
Prototype almost finished														
Proposal correction														
Meeting with Supervisor														
Making Questionares on google form														
Logbook														
Report Writing Proposal on Chapter 4														
Meeting with Supervisor														
Give questionares to consumer by using link google form														
Logbook														
Continue report writing Chapter 4														
Meeting with Supervisor														
Logbook														
Continue report writing Chapter 4														
Data Analysis														
Meeting with Supervisor														
Logbook														
Continue report writing Chapter 4														
Meeting with Supervisor														
Logbook														
Report Writing Proposal Chapter 5														
Meeting with Supervisor														
Logbook														
FPIC (FINAL PRESENTATION)														
Meeting with Supervisor														
Logbook														

APPENDICES

APPENDICES (A)

QUESTIONNAIRE

SECTION A

1.Do you currently have a mirror in your home?

- Yes
- No

2.Have you experienced any issues or challenges with your current mirror? (e.g., lack of adjustable height, poor lighting, insufficient storage)

- Yes
- No

3. Would you be interested in a mirror that offers adjustable height, built-in LED lighting, and smart compartmentalization made from eco-friendly materials?

- Yes
- No

SECTION B

PURCHASE AND INTENTION **1 - Strongly disagree** **2 - Disagree** **3 - Neutral** **4 – Agree** **5 – Strongly Agree**					
I would like to purchase an adjustable LED mirror with eco-friendly features if it is available.	1	2	3	4	5
I prefer buying innovative products, like the Glam Mirror	1	2	3	4	5
I believe a mirror with LED lights, adjustable height, and compartmentalization is necessary for personal use.	1	2	3	4	5
I tend to prioritize product functionality and sustainability over aesthetics when making a purchase decision.	1	2	3	4	5
I plan to purchase the Glam Mirror one day.	1	2	3	4	5

SECTION C

PERCEIVED VALUE					
1 - Strongly disagree **2 - Disagree** **3 - Neutral** **4 – Agree** **5 – Strongly Agree**					
I believe an adjustable LED mirror with eco-friendly features offers good value for the price.	1	2	3	4	5
The combination of adjustable height, LED lighting, and storage compartments would make this mirror feel like a worthwhile investment.	1	2	3	4	5
I perceive mirrors made from eco-friendly materials as higher value products compared to those made from conventional materials.	1	2	3	4	5
I would be willing to pay a premium price for a mirror that is both functional and eco-friendly.	1	2	3	4	5
I believe that a product's sustainability contributes significantly to its overall value.	1	2	3	4	5

SECTION D

CONSUMER INNOVATIVENESS					
1 - Strongly disagree **2 - Disagree** **3 - Neutral** **4 – Agree** **5 – Strongly Agree**					
I am open to trying new, innovative products like an adjustable LED mirror with eco-friendly features.	1	2	3	4	5
I tend to seek out and purchase products that incorporate the latest technology or innovative features.	1	2	3	4	5
I am excited about the idea of a mirror that combines multiple functions, such as adjustable height, LED lighting, and storage compartments.	1	2	3	4	5
I am willing to try a new product if it promises to solve common problems I face with traditional mirrors.	1	2	3	4	5
I believe that innovative products, such as an eco-friendly adjustable LED mirror, are more likely to improve my daily life.	1	2	3	4	5

SECTION E (DEMOGRAPHIC)

1.AGE

18-24	25-34	35-44	45 & above

2.GENDER

- Male
- Female

3.OCCUPATION

- Student
- Employed full-time worker
- Employed part-time worker
- Unemployed