



## DESIGN AND DEVELOPMENT OF MULTIPURPOSE DRAFTING BAG (MULDRAB)

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**Abstract:** The progression of bag utility in daily life culminated in the development of the Multipurpose Drafting Bag, a vital innovation meticulously crafted to cater to the specific needs of students. Employing a developmental research design, the study addressed challenges faced by drafting students and educators in the transportation of materials. The comprehensive design phase navigated through pivotal stages, including Draft Plan, Tools, Materials, and Equipment, and Cost and Benefit Analysis. Throughout this meticulous process, the Multipurpose Drafting Bag underwent rigorous testing to ensure its efficacy across multiple dimensions. This encompassed the evaluation of its functional attributes, durability, storage capacity, user comfort, and resistance. Collaboration with seasoned sewing experts and the invaluable guidance of adviser Mr. Billie Jack Pasion played pivotal roles in validating not only the bag's innovative design elements but also its overall integrity. The successful functionality and aesthetics in the Multipurpose Drafting Bag underscored its effectiveness in addressing real-world demands. Mr. Pasion's expertise further enhanced the bag's credibility, marking a notable advancement in the intersection of practical design and educational tools. This holistic approach to the development of a specialized bag not only served the immediate needs of drafting professionals but also contributed to the broader landscape of educational tools and technology.

**Keywords:** *Multipurpose, drafting bag, drafting students, durable.*

### Introduction:

Ever since people started acquiring possessions, bags have always been a necessity in many people's daily lives. Nevertheless, through time, the contents of all the bags have started evolving. People have been using bags since they were unable to carry everything within their hands. With a bag, they could carry a considerable number of items inside at once. In the 20th century, students who decided to pursue a career in drafting were required to bring a huge number of supplies with them. In that case, the invention of a multipurpose drafting bag is an essential task that represents an important progress for society, especially to the department of field study.

The primary goal of a multipurpose drafting bag has always been to provide students the comfort they need to optimize all the resources they have to administer. This study identified the



issues that drafting students encounter while adjusting to a variety of equipment, output, drawing materials, and perhaps even on folded paper. As a student at NEUST - College of Industrial Technology pursuing a career in Drafting Technology, researchers was able to contribute and share knowledge in the areas of science and technology as it has been produce to assist society in order to improve and acquire information about the process of creating work more efficiently than it used was.

Varied types of bags have different design requirements and the required load must be supported with fabrics that are incredibly flexible, afford to give a product adequate resistance at a lighter density, and have aesthetic characteristics that designers can exploit.

### **Methodology**

The study was use developmental research design. According to (Richey & Nelson. (2001) as cited in Pasion (2021), developmental research is the systematic study of designing, developing and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness. Additionally, developmental research is the examination of the instructional design, development, and evaluation process in its entirety or with respect to specific process elements (Richey, Rita C., Klein, James D. and Nelson, Wayne A.).

Developmental research is immensely useful, particularly in the area of educational technology. This study also makes use of one of the most popular kinds of developmental research design: the product-development approach, in which the generated product is developed, implemented, and then evaluated. In this study, the researchers utilized the phases of product development and the model used during the assembly of the Multipurpose Drafting Bag.

### **Results and Discussion**

#### **1. Designing and developing the Multipurpose Drafting Bag**

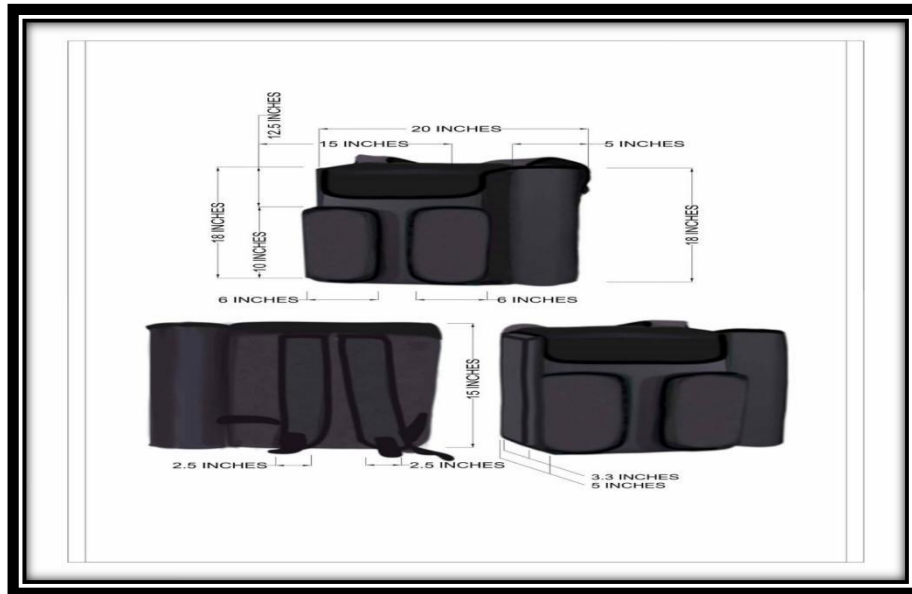
The designing and developing phase of the MulDraB followed the stages of the IPO model, however, the researchers excluded the two stages such as the implementation and evaluation to suit the needs of the study, which is to design and develop an Multipurpose Drafting Bag.

##### **1.1 Designing Phase**

During the design phase, the researcher conducted data using SOP 1, which is Draft Plan, Tools, Materials and Equipment, and Cost and Benefit Analysis. It is important for a researcher to explore the materials that be used to construct a prototype and the steps that must be taken to make the production process more successful so that when these two processes are effective, the researcher produce a good final product.

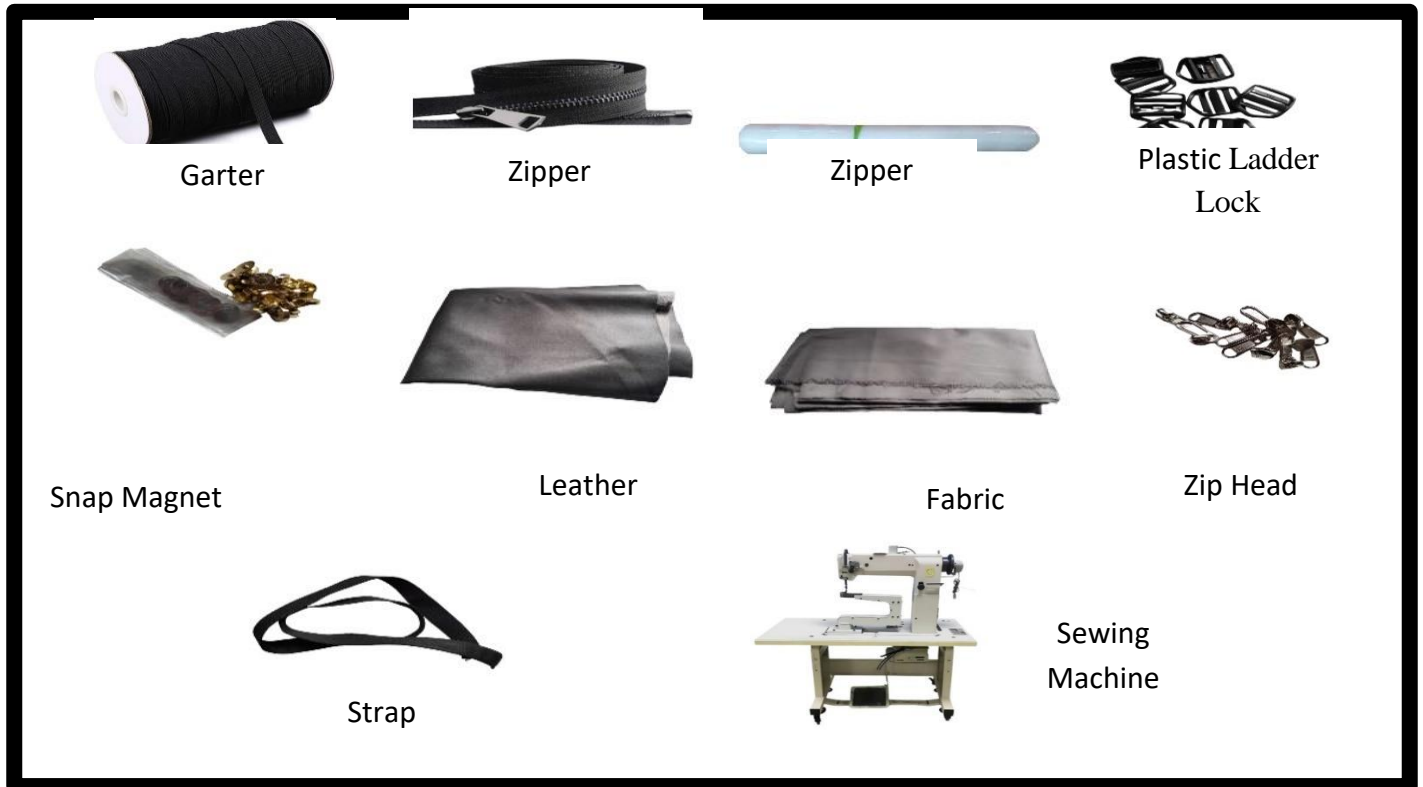
### 1.1.1 Draft Plan

Isometric drawing is a method used by technical illustrators, engineers, and occasionally architects to graphically portray three-dimensional objects. The technique aims to represent the object's principal dimensions or those parallel to a selected set of three mutually perpendicular coordinate axes, in an undistorted manner while also creating the appearance of depth similar to that of a perspective rendering.



*Figure 1. Isometric drawing of Multipurpose Drafting Bag*

### 1.1.2. Tools, Material, and Equipment



**Figure 2:** Tools, Materials, and Equipment used to make the Multipurpose Drafting Bag

The construction of any project is significantly influenced by the utilization of tools, materials, and equipment. The materials that utilized in this study are Garter, Zipper, Foam, Plastic ladder lock, Snap magnet, Leather, Fabric, Zip head, and Strap. The garter was used to hold art materials such as pencil, unipin, mechanical pencil, sign pen, and others. Inside the pencil case organizer. The Zipper used to keep your personal items secure inside of the bag. They also play an important role in the design and style of a bag. Foam provides great protection to all the materials and even device inside the bags, In addition foam provide comfortable when the customer used the bags. Plastic Ladder lock or Ladder lock buckle used for adjusting length or tightness of strap in the bag. The magnetic snap used to create closures and secure opening for bags. Leather used in the overlap to show the style and design of the bag, as well as durability. One of the most important part in bag making. Because, fabric used to made the different part of a bags. Zip Head used to open or close the zipper and Strap used for simply carrying weight comfortably on your shoulder.



| Quantity     | Unit | Materials              | Unit Price | Price       |
|--------------|------|------------------------|------------|-------------|
| 2            | Pcs  | Garter                 | ₱60        | 60          |
| 1            | Yarn | Zipper                 | ₱44        | 44          |
| 1            | Yarn | Foam                   | ₱130       | 130         |
| 2            | Pcs  | Plastic Ladder<br>Lock | ₱35        | 35          |
| 10           | Pcs  | Snap Magnet            | ₱86        | 86          |
| 1            | Yarn | Leather                | ₱135       | 135         |
| 1½           | Yarn | Fabric                 | ₱141       | 141         |
| 4            | Pcs  | Zip Head               | ₱50        | 50          |
| 1            | Yarn | Strap                  | ₱80        | 80          |
| <b>Total</b> |      |                        |            | <b>₱761</b> |

**Table 1:** Total Cost of the Multipurpose Drafting Bag

## 2. The Development of Multipurpose Drafting bag

During the development phase, the researcher executes the data through SOP 2, which is the Gantt chart, Construction, and Testing. The researcher systematically analyzed and evaluated the product to discern any notable impact it may have.



## 2.1 Gantt chart

The Gantt chart shows the graphical representation of activities of the Multipurpose Drafting Bag starting from conceptualization, designing, construction, and testing.

|  | September 16 - 17 | September 22 - 23 | October 11 - 16 | October 24 - 29 | October 30 |
|--|-------------------|-------------------|-----------------|-----------------|------------|
| PLANNING & CANVAS OF MATERIALS         |                   |                   |                 |                 |            |
| CONSULTATION WITH SEWING EXPERT        |                   |                   |                 |                 |            |
| IMPLEMENTATION                         |                   |                   |                 |                 |            |
| MANUAL HAND SEWING IN PENCIL ORGANIZER |                   |                   |                 |                 |            |
| FINISHING                              |                   |                   |                 |                 |            |

### Legends:

|           |           |            |
|-----------|-----------|------------|
| 1-2 Hours | 5-6 Hours | 9-10 Hours |
| 3-4 Hours | 7-8 Hours |            |

## 2.2 Construction

The Construction process involves creating a drawing plan, preparing the necessary materials, tools, and equipment, and organizing them in a working table to guide the construction process. During the development stage, meticulous attention was given to crafting each segment of the bag, ensuring the prototype's design was both consistent and accurate. A sewing expert provided guidance, demonstrating the proper use of materials and equipment for constructing the bag. Every measurement and fabric cut was diligently verified to precisely fit each component, with the aim of preventing any loss or wastage.





*Figure 3: Construction of Multipurpose Drafting Bag*

### 2.3 Testing

During the testing phase of Multipurpose Drafting Bag, each aspect of the bag underwent evaluation to determine its durability and overall condition. The researchers created a draft plan, tools, materials, and equipment, conducted the cost and benefit analysis. The prototype developed using Gantt chart, followed by a step-by-step construction process and testing. After the prototype was made by the researchers and by the help of sewing expert, The researchers assessed both students and teachers to verify the durability and usability of the prototype's features. The testing confirmed that it outperformed traditional bags in terms of both durability and usability. In addition MulDraB has a large capacity to put all the things needed the researchers received positive feedback and suggestions from the participants. Figure 4 shows the finished product of the MulDraB Multipurpose Bag.



*Figure 4. Complete the multipurpose drafting bag.*

## **Conclusion**

Thorough testing phase, collaboration with sewing experts, and validation from Mr. Billie Jack Passion collectively form a strong conclusion for the multipurpose drafting bag. Rigorous evaluations covering durability, versatility, and practicality affirm the bag's resilience in real-world use.

The contributions of sewing experts, refining quality, and enhancing structural integrity, highlight a dedication to excellence. Mr. Passion's endorsement adds further credibility, acknowledging the bag's innovative design and adherence to high-quality standards. This collaborative endeavor not only establishes the multipurpose drafting bag as a dependable choice for professionals and creatives but also underscores an ongoing commitment to user satisfaction and continual enhancement. The product stands as a testament to meticulous development, blending durability, versatility, and ergonomic design to cater to the diverse needs of artists, architects, and students.





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