International Journal of Social and Education (INJOSEDU) e-ISSN: 3047-6151
Vol. 2 No. 10 January 2026, hal., 2824-2839

DESIGN OF SUSTAINABILITY-BASED MULTIFUNCTIONAL FURNITURE TO ENHANCE THE FLEXIBILITY OF COLLABORATIVE SPACES AT THE "WORK UNUSUAL" COFFEE SHOP

Wahyu Dwi Utami[1], Santi Salayanti[2], Agustinus Nur Arief Hapsoro[3]
Master of Design, Faculty of Creative Industries, Telkom University, Bandung, Indonesia.
author email: dwitami@student.telkomuniversity.ac.id[1]

Abstract

This study discusses the design of multifunctional furniture at the "Work Unusual" coffee shop, which features collaborative spaces with a high intensity of collaboration and requires spatial flexibility. The main problem arises from users' needs for adaptive, ergonomic, and sustainable furniture, while the existing facilities have not fully supported the variety of community activities. This study aims to identify user needs, evaluate existing conditions, and formulate alternative furniture designs that are more functional and responsive to collaborative activities. The research employs an exploratory mixed-methods approach, in which the qualitative stage serves as the foundation for an in-depth understanding of the phenomenon. Data were collected through observations, interviews, questionnaires, and documentation to explore user experiences related to functionality, flexibility, and sustainability aspects of the furniture used at "Work Unusual." The collected data were then used to develop quantitative instruments, which were analyzed using the Simple Additive Weighting (SAW) method to determine the most optimal design alternative. The design process follows the stages of design thinking as a systematic approach to solving design problems. The results indicate that users require furniture that is multifunctional, flexible, and compatible with various activities such as workshops, bazaars, and dine-in activities. The SAW analysis shows that functionality, flexibility, sustainability, and aesthetics are the main determining factors in user preferences. In addition, the study finds that sustainable materials and modular designs have the greatest potential to improve spatial efficiency. Therefore, multifunctional furniture designed with functional, flexible, and sustainability principles can contribute to optimizing collaborative spaces at "Work Unusual." This study provides comprehensive design recommendations and can serve as a reference for the development of adaptive furniture in other collaborative spaces.

Keywords: Coffee Shop, Ruang Kolaboratif, Furnitur Multifungsi.

INTRODUCTION

The growth of coffee shops in Bandung has reached approximately 10% annually (Specialty Coffee Association of Indonesia, 2022). This development is not only related to an increase in numbers but also to a transformation in spatial functions. Today, coffee shops serve not only as spaces for consumption but also as productive spaces for urban communities to work, study, discuss, and engage in creative activities (Olifia et al., 2022).

This concept aligns with the notion of the *third place* as a neutral and comfortable alternative space outside the home and office (Oldenburg, 1999), particularly following the pandemic, which has accelerated flexible work practices and remote working (Akhavan, 2021).

Generation Z, as the dominant users of coffee shops, utilizes these spaces as venues for productive activities, self-expression, and community interaction (Azzahra et al., 2023). Based on social bonding theory, engagement in positive social activities enhances productivity and strengthens interpersonal relationships (Hirschi, 2017). In the context of interior design, such engagement needs to be facilitated through collaborative spaces that are functional, flexible, and comfortable for diverse activities (Dyah Ratnasari et al., 2025). Therefore, coffee shops that provide collaborative spaces have strategic potential in supporting productive urban lifestyles while also contributing to the growth of the creative economy.

"Work Unusual" is a community-based coffee shop in Bandung that adopts the sustainability vision "Less Waste More Coffee." Its main space functions dually as a consumption area and a collaborative space used for various activities such as bazaars, pop-up markets, local product marketing, and creative workshops. Observations indicate that community activities occur at least once a month with an average duration of three days, while workshops typically last around three hours. These conditions demonstrate that the high dynamics of activities demand rapid and efficient spatial transformation.

However, the collaborative space at "Work Unusual" still faces constraints, including limited spatial dimensions (6.2 m × 5.8 m) and the use of static furniture that is difficult to reconfigure. Collaborators often bring additional non-uniform furniture, resulting in overcrowding, disrupted circulation, and reduced user comfort. Moreover, the materials and finishes of the existing furniture pose potential risks of minor injuries, such as clothing catching on rough edges. In fact, flexibility, functionality, ergonomics, and safety are essential elements of spatial usability quality (Kopec, 2018; Tilley, 2002).

A review of the literature indicates that studies on modular and multifunctional furniture predominantly focus on residential and workplace contexts, while research related to coffee shops with collaborative spaces and integrated functions remains limited (Wang et al., 2023; Pratama & Rahman, 2022). In addition, the use of coffee waste as furniture material in public spaces has rarely been explored. Thus, there is a research gap regarding furniture design as a strategic element in optimizing limited-space coffee shops that adopt sustainability principles. Therefore, this study aims to design modular multifunctional furniture based on functionality, flexibility, and sustainability to enhance the effectiveness of spatial transformation and user comfort in the collaborative space of "Work Unusual."

RESEARCH METHOD

This study employs an exploratory mixed methods approach, in which the qualitative approach serves as the foundation for data collection and is subsequently followed by a quantitative stage to validate and strengthen the initial findings (Kusumastuti et al., 2025). The qualitative phase is conducted to explore interior design and furniture phenomena in the collaborative space of "Work Unusual," encompassing user experiences, spatial needs, and sustainability principles. Data are collected through observations, interviews, questionnaires, and documentation to capture users' meanings and understandings of space and furniture performance (Creswell, 2017). The findings from the qualitative stage form the basis for developing quantitative research instruments.

In the quantitative stage, evaluation criteria for design alternatives are measured based on aspects of functionality, flexibility, sustainability, and aesthetics. The analysis is carried out using the Simple Additive Weighting (SAW) method to obtain an objective assessment of the most relevant furniture design priorities.

The integration of both research stages is conducted using the design thinking approach as an iterative framework consisting of empathize, define, ideate, prototype, and test. This approach aims to ensure that the resulting design recommendations are user-centered and aligned with the characteristics of the space. Therefore, the combination of exploratory mixed methods and design thinking is expected to produce a furniture design process that is more comprehensive, measurable, and responsive to issues of multifunctionality and sustainability in community-based coffee shops.

RESULT AND DISCUSSION

Field Observation Results (Empathize)

1. **Zoning of "Work Unusual" Spaces**

Figure 1. "Work Unusual" Space Zoning
Source: Personal documentation, Utami 2025

"Work Unusual" has five spatial zones. The main space serves as the central node connecting all areas and is the space with the highest activity intensity. The main space functions as a collaborative space directly integrated with the cashier area. In addition, there is a non-smoking indoor zone for regular customer seating, a meeting room as a semi-private area for discussions and meetings requiring higher concentration, and a mini garden as a transitional space with a biophilic approach that provides a fresh and comfortable atmosphere. There is also an indoor smoking area, the largest in size, designed to accommodate a larger number of visitors.

2. **Collaborative Space**

Figure 2. Collaborative Space "Work Unusual"
Source: Personal documentation, Utami 2025

The "Work Unusual" collaborative space is located in the main room, measuring 6.2 meters x 5.8 meters and serves as the center of activity and a hub between the space's zones. The collaborative space's users consist of four main groups: staff, collaborators, regular customers, and event attendees. This diversity of users creates space requirements that demand high flexibility and functionality. Functionally, the collaborative space is used for consumption activities and various productive activities such as bazaars, pop-up markets, community gatherings, and workshops.

3. **Collaborative Space Furniture**

Figure 3. Collaborative space furniture
Source: Personal documentation, Utami 2025

The main "Work Unusual" space utilizes static furniture that is not designed to support rapid changes in function. This limits arrangement flexibility, especially when the space is used for collaborative activities and exhibitions. This also impacts inefficient logistics flows, as space adjustments require time and potentially disrupt daily operations. The limited flexibility of the furniture also impacts the display

layout, which tends to be one-way and creates narrow circulation. As a result, visitors accumulate at the beginning of the display area, while the middle and end areas are less accessible, reducing the quality of the visitor experience and the level of interaction with the exhibition content.

Furthermore, the physical quality of the furniture shows issues with poor finishes and angles that can potentially cause minor injuries. From an ergonomic perspective, the dimensions of tables and chairs that do not meet comfort standards cause users to quickly become fatigued, both while working and interacting in collaborative activities. Overall, static, poorly ergonomic furniture and safety risks are major obstacles to realizing "Work Unusual" as a flexible and sustainable collaborative space.

4. Collaborative Space Activities

a. Bazaar

Figure 4. Bazaar activities in a collaborative space
Source: Personal documentation, Utami 2025

Bazaar activities in the "Work Unusual" collaborative space are typically held at least once a month and last for two to three consecutive days. The bazaar is dominated by sales of creative products such as thrifted clothing, accessories, vintage items, and local products. Interest in bazaars is high, especially among young people and the creative community, resulting in a significant increase in visitor numbers compared to normal operating days.

However, bazaar activities have the potential to cause disruptions in the form of overcrowding, restricted circulation, and overlapping display areas with regular visitor movement paths. Key requirements for this activity include display furniture that is modular, easily moved, has a variety of heights and hangers, and can accommodate the number of tenants without compromising the space.

b. Pop-Up Market

Figure 5. Pop-up market activity in a collaborative space
Source: Personal documentation, Utami 2025

Pop-up markets have similar characteristics to bazaars, but are shorter in duration, generally one to two days, and thematic in nature. They are held regularly, following a collaborative calendar with a specific brand or community. Pop-up market enthusiasts come from loyal visitors and communities with specific interests in the products on display. Disruptions arise from the placement of static furniture, which overlaps the cashier and display areas, reducing visitor comfort. Therefore, multifunctional furniture is needed that can quickly transform from consumer chairs to display tables.

c. Community Gatherings

Figure 6. Community gathering activities in collaborative spaces
Source: Documentation of "Work Unusual" 2025

Community gathering activities are quite intense and flexible, both scheduled and spontaneous. The duration of these activities is relatively short to medium, ranging

from one to three hours. Participants include creative, music, sports, and social communities, with a fluctuating number of participants. The main obstacles to these activities are limited seating configurations and the lack of furniture flexibility to create group seating patterns. The space requirements for these activities require furniture that is lightweight, easily rearranged, and supports social interaction without impeding the circulation of other visitors.

d. Workshop

Figure 7. Creative Workshop Activities in a Collaborative Space
Source: Documentation of "Work Unusual" 2025

Figure 7. Workshop sharing session activity in a collaborative space
Source: Documentation of "Work Unusual" 2025

Creative workshops and sharing sessions are routine, with an average duration of around three hours per session. These activities include journaling, crafting, matcha classes, baking classes, and creative discussions. Workshop participants tend to be stable and actively participatory, requiring a more structured and comfortable space for relatively long periods. Disadvantages include limited work tables, furniture heights that are incompatible with manual activities, and difficulties in quickly rearranging the space before and after the session. The primary requirement for these activities is ergonomic, stable, and flexible furniture that can support detailed work activities while being easy to store or move after completion.

Design Process (Define)

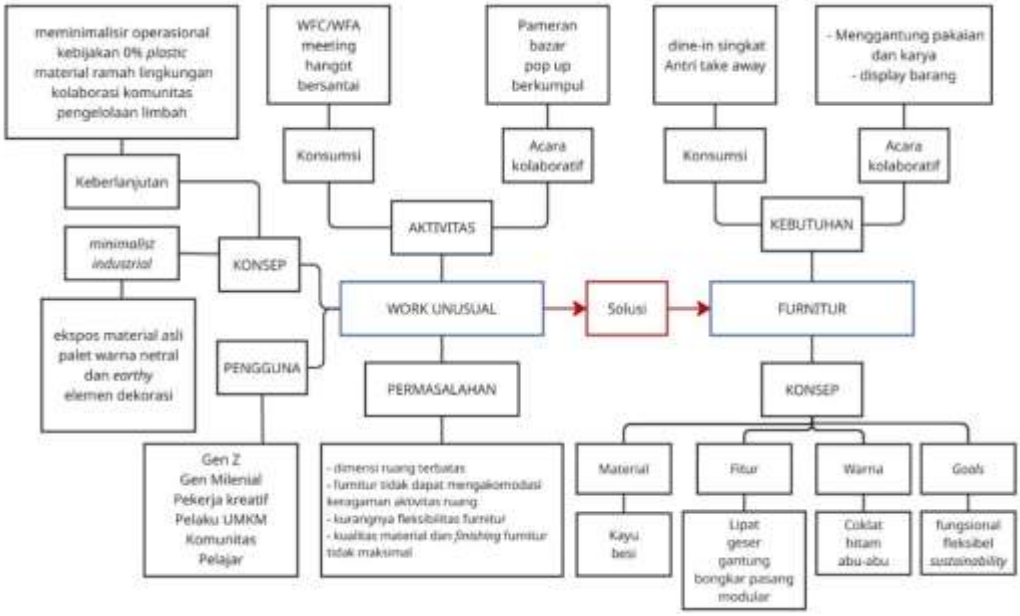

Figure 8. Mind Mapping
Source: Personal documentation, Utami 2025

The mind mapping process involved brainstorming with the owner of "Work Unusual," collaborators, and visitors to establish a design direction that served as the basis for developing the design concept. The results indicated that the collaborative space focused on functionality, flexibility, and sustainability, with consideration of materials, features, and colors that support the minimalist industrial space concept, accommodating a variety of activities.

Alternative Design (Ideate)

Alternative One

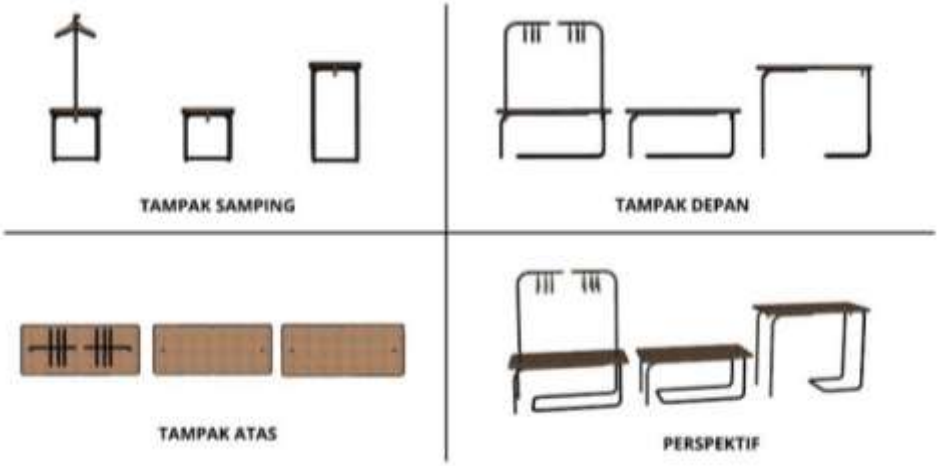

Figure 9. Alternative One
Source: Personal documentation, Utami 2025

The first alternative uses a simple locking mechanism on the main structure, consisting of a table top and three leg frames (Ibrahim & Putri, 2025). Each component is designed modularly so it can be reconfigured into a display table, chair, or display table with hangers. This design embraces a minimalist industrial concept that emphasizes simplicity of form and visual efficiency, with advantages in configuration flexibility, ease of mobility, and storage efficiency. However, its limitations lie in the relatively longer assembly and disassembly times.

Alternative Two

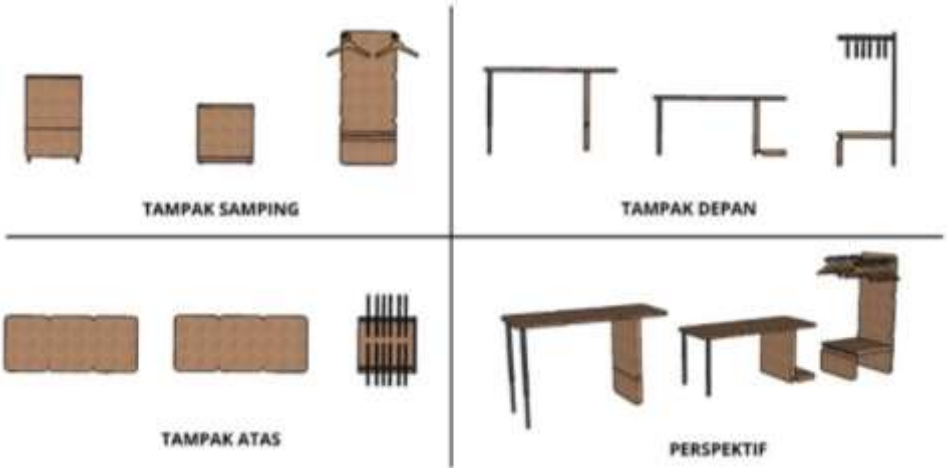

Figure 10. Alternative two
Source: Personal documentation, Utami 2025

The second alternative uses a folding principle with locking hinges, which allows for rapid shape transformation without additional assembly (Cheng et al., 2021). This furniture has a single base shape that can function as a display table with hangers, a chair, or a display table by adjusting the legs. While offering ease of use and structural stability with a minimalist industrial visual character, this design has a drawback in terms of storage because it cannot be disassembled, requiring more storage space.

Alternative three

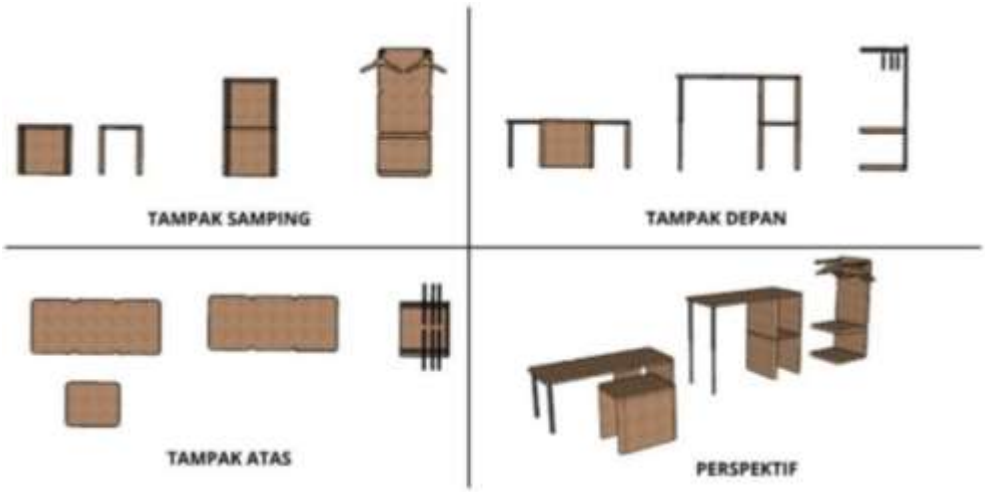

Figure 11. Alternative Three
Source: Personal documentation, Utami 2025

The third alternative was developed based on modular principles with two main elements: tables and chairs (Shi et al., 2025). This furniture supports flexible use, for both dine-in and event activities, through a stacking and height adjustment system that maintains ergonomics. Furthermore, the chairs can function as display tables with hanging racks in a standing position. The main constraint with this alternative is the relatively larger space requirement compared to the other two alternatives.

Based on the three design alternatives mentioned above, the next stage was a selection process using the SAW method to determine one alternative to be selected as the final prototype. The assessment process was aimed at eight respondents: two staff members, two collaborators, two visitors, and two competent lecturers. The SAW method works through several stages, as follows:

1. Alternative Design Assessment Analysis
   This stage is the initial step, where each alternative has a different level of importance. Weights are determined based on the level of importance, with a total criterion importance score of 10 and a criterion weight of 1, as follows:

$$w_j = \frac{x_j}{\sum_{j=1}^{n} x_j}$$

   Description:
   w_j = weight of the j criterion
   x_j = importance score of the j criterion
   n = number of criteria

Table 1. criteria weights

No	Description	x_i	w_i
C1	Functionality	3.5	0.35
C2	Flexibility	3.0	0.30

C3	Sustainability	2.0	0.20
C4	Aesthetics	1.5	0.15

Source: Personal documentation, Utami 2025

2. Summary of Eight Respondents' Assessments of Three Design Alternatives
   The assessment scale used was a Likert scale ranging from 1 to 5, where 1 indicates very inappropriate and 5 indicates very appropriate to the criteria.

Table 2. Assessment summary

Responden	Alternatif	C1	C2	C3	C4
Staff 1	A1	4	4	5	4
	A2	4	3	4	4
	A3	4	4	4	3
Staff 2	A1	5	5	3	5
	A2	5	3	4	3
	A3	3	4	3	4
Kolaborator 1	A1	5	4	5	4
	A2	5	4	2	3
	A3	3	4	2	3
Kolaborator 2	A1	5	4	5	5
	A2	4	4	1	2
	A3	2	4	2	2

Responden	Alternatif	C1	C2	C3	C4
Dosen 1	A1	4	4	3	3
	A2	3	2	3	4
	A3	4	2	3	2
Dosen 2	A1	2	2	4	2
	A2	2	2	4	2
	A3	2	2	2	4
Pelanggan 1	A1	5	4	5	5
	A2	2	3	1	2
	A3	2	3	2	3
Pelanggan 2	A1	5	5	5	5
	A2	4	4	3	3
	A3	3	2	2	2

Source: Personal documentation, Utami 2025

3. Calculation of Average Score for Each Design Alternative
   From eight respondents, the average score for each criterion for each design alternative was obtained as follows:

$$\text{Average} = \frac{sum\ of\ all\ data\ values}{A\ lot\ of\ data} \ldots\ldots\ldots (2)$$

Table 3. Average rating

Source: Personal documentation, Utami 2025

4. Normalization of Criteria Values
   Because all criteria are benefit-based (the higher the value, the better), the following formula is used:

$$r_{ij} = \begin{cases} \dfrac{x_{ij}}{\max(x_j)} & \text{(If the criteria are beneficial, then the bigger the better)} \\ \dfrac{\min(x_j)}{x_{ij}} & \text{(If the criteria are cost then the smaller the better)} \end{cases}$$

Keterangan:

$\mathcal{X}_{ij}$: the value of the i-th alternative against the j-th criterion

r_{ij}: normalization value

$\max(x_j)$: maximum value of the jth criterion

$\min(x_j)$: minimum value of the jth criterion

Maximum value for each criterion:

C_1= 4.375, C_2= 4.000, C_3= 4.375, C_4= 4.125

Normalization results:

Table 3. Average assessment

Alternative	r(C_1)	r(C_2)	r(C_3)	r(C_4)
A_1	4.375/4.375 = **1.000**	4.000/4.000 = **1.000**	4.375/4.375 = **1.000**	4.125/4.125 = **1.000**
A_2	3.625/4.375 = **0.829**	3.125/4.000 = **0.781**	2.750/4.375 = **0.629**	2.875/4.125 = **0.697**
A_3	2.875/4.375 = **0.657**	3.125/4.000 = **0.781**	2.500/4.375 = **0.571**	2.875/4.125 = **0.697**

Source: Personal documentation, Utami 2025

5. Calculating Preference Values (v_i)

The final step is to calculate the preference value for each alternative using the formula:

$$v_i = \sum_{j=1}^{n} w_j . r_{ij}$$

Description:

v_i: total score of the i-th alternative

w_j: weight of the jth criterion (sum of weights = 1)

r_{ij}: normalization value

n: number of criteria used

Table 4. Preference Values

Alternative	Calculation	Final score (v_i)
A_1	(0.35×1.000) + (0.30×1.000) + (0.20×1.000) + (0.15×1.000)	1.000
A_2	(0.35×0.829) + (0.30×0.781) + (0.20×0.629) + (0.15×0.697)	0.755
A_3	(0.35×0.657) + (0.30×0.781) + (0.20×0.571) + (0.15×0.697)	0.683

Source: Personal documentation, Utami 2025

Based on the results of the calculation process using the SAW method on three design alternatives, the highest score was obtained, namely design alternative A1, with a final score of 1.000. This indicates that design alternative A1 is the best alternative and best meets the criteria of functionality, flexibility, sustainability, and aesthetics.

Prototype

1. Design Principles and Structure

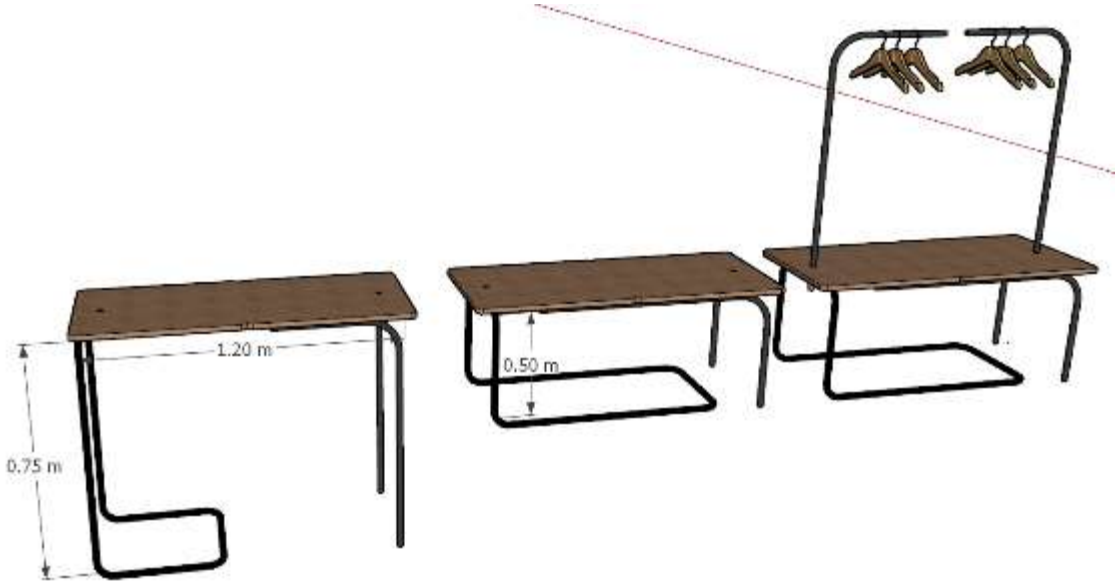

Figure 12. prototype
Source: Personal documentation, Utami 2025

This furniture prototype was designed to accommodate the needs of collaborative spaces, applying the principles of multifunctionality, flexibility, and sustainability. The main structure is based on simple and sturdy U- and L-shaped iron frame legs, with a disassembly system designed with a locking mechanism on the underside of the tabletop. This shape allows the furniture to adapt to various changes in room activity, while also simplifying storage without requiring additional storage space. The design consists of one tabletop and three leg modules that can be adjusted according to user needs, ensuring the furniture remains proportional and meets sustainability requirements through durability and environmentally friendly materials that are easy to maintain.

2. Materials

Figure 13. Material
Source: https://id.pinterest.com/

The surface material for the furniture in this design uses Kalpa Board, an environmentally friendly composite board produced from coffee waste mixed with resin as a binder. Kalpa Board was chosen based on its suitability to the sustainability

concept promoted by "Work Unusual," while also supporting the principle of circular design by utilizing organic waste into useful materials.

Characteristically, Kalpa Board has a distinctive visual texture with a natural blackish-brown color that aligns with the minimalist industrial concept applied to the furniture design. From a technical perspective, this material has sufficient compressive strength for table and display purposes, is relatively light in weight, supporting furniture mobility, and can be processed with simple cutting and finishing techniques. However, this material requires additional finishing treatment in the form of a protective coating to increase resistance to moisture and friction, especially in the context of intensive use in public spaces.

Thus, the use of Kalpa Board serves not only as an aesthetic element but also as a sustainable design strategy that integrates environmental values, function, and the identity of the coffee shop community space.

The legs are made of 32 mm diameter, 2 mm thick iron pipe, suitable for tables up to 120 cm wide (Helsinki, 2008). They are then given a glossy black finish to enhance the visual appeal, matching the minimalist industrial concept of the space.

3. Locks

Figure 14. Locking
Source: https://id.pinterest.com/

The locking for the furniture structure will be placed under the table surface using special iron clamps for iron pipes. This mechanism is used to lock the table leg frame to ensure stability and ease of assembly and disassembly without the need for permanent connections. This clamp works using a compression clamping system that applies circular pressure to the iron pipe, ensuring the table leg is firmly locked in the specified position and minimizing the risk of slippage.

CONCLUSION

This study concludes that the "Work Unusual" collaborative space has high potential as a community space with diverse activities, but is not yet supported by furniture that can adapt to space limitations and dynamic usage. Current static furniture limits arrangement flexibility, disrupts circulation, and reduces user comfort and experience.

Through an exploratory mixed methods approach and design thinking, this study produced modular and multifunctional furniture alternatives that better suit the needs

of limited space and high collaboration intensity. Evaluation using the SAW method showed that furniture with good levels of flexibility, functionality, and ergonomics is the most effective solution. The use of Kalpa Board as a surface material also strengthens sustainability aspects by utilizing waste from coffee grounds without compromising aesthetics and safety. Thus, this study confirms that furniture plays a strategic role in optimizing collaborative spaces in community-based coffee shops and contributes to the development of flexible, sustainable, and user-oriented interior design.

REFERENCES

Akhavan, M. (2021). *Third Places for Work: A Multidisciplinary Review of the Literature on Coworking Spaces and Maker Spaces* (pp. 13–32). https://doi.org/10.1007/978-3-030-63443-8_2

Azzahra, M., Abdurahman, A. I., & Alamsyah, A. (2023). Fenomena Ngopi di *Coffee shop* Pada Gen Z. *Social Science Academic*, *1*(2), 493–506. https://doi.org/10.37680/ssa.v1i2.3991

Creswell, J. W. . (2017). *Research design : qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE.

Dyah Ratnasari, S., Malangkucecwara Indonesia, S., & Author Siwi Dyah Ratnasari STIE Malangkucecwara Indonesia, C. (2025). Caffeine and Culture: Understanding Gen Z Work Ethos in Malang *Coffee shop*s. In *ISAR Journal of Arts, Humanities and Social Sciences* (Vol. 3, Issue 7). https://isarpublisher.com/journal/isarjahss54

Hirschi, T. (2017). *Causes of Delinquency*. Routledge. https://doi.org/10.4324/9781315081649

Kopec, Dak. (2018). *Environmental psychology for design*. Fairchild Books, an imprint of Bloomsbury Publishing Inc.

Kusumastuti, Y., Suryaatmaja, K., Wiliyanti, V., Kristina, K., Nuraini, C., Sepriano, S., & Putri, N. O. (2025). *Pengantar penelitian Mixed methods*. PT. Sonpedia Publishing Indonesia. https://books.google.co.id/books?id=eRpXEQAAQBAJ

Oldenburg, Ray. (1999). *The great good place : cafés, coffee shops, bookstores, bars, hair salons, and other hangouts at the heart of a community*. Marlowe ; Distributed by Publishers Group West.

Olifia, S., Rajagukguk, S., & Ananda, A. (2022). Makna Kedai Kopi Sebagai Ruang Publik Di Kalangan Remaja. *Ikon --Jurnal Ilmiah Ilmu Komunikasi*, *27*(3), 251–266. https://doi.org/10.37817/ikon.v27i3.2614

Tilley, A. R. . (2002). *Measure of Man and Woman - Human Factors in Design* (Revised edition, Vol. 1). John Wiley and Sons.