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Design of Table Chair Flexibility Products Using Antopometry Methods to Minimize Land Use

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***Abstract*— In an increasingly advanced era, all property or home furniture is required to have a renewable innovation and efficiency. This is because property or home furniture currently has a very large mass or size. Large furniture sizes such as chairs and tables have an average area of 500cm2. Almost 90% of Indonesian people have tables and chairs as the contents of their household furniture. Not only functioned at home, in restaurants, cafes, malls, offices, in parks and all places where if there is interaction between humans, there must be chairs and tables as places for interaction. But sometimes the owners of chairs and tables often complain about the size of the tables and chairs, so they need a large enough area to place these two items. The problem that exists in society today is the narrowing of empty land in one place. Sometimes there is home furniture that is not ergonomic, such as a chair that is too high, a table that is too low and so on. By using this anthopometric method, the measurements obtained include a chair along the 95th percentile 25 cm, chair length 33 cm 95th percentile, table length 68 cm 5th percentile, chair height 39 cm 5th percentile, table height 69 cm 5th percentile, and finally lower surface height. a table of 54 cm on the 95th percentile, and it is hoped that the manufacture of a chair flexibility table product design can overcome all the problems of land limitations that exist in today's society.**

Keywords: Table chair flexibilty

I. INTRODUCTION

Chairs and tables are household furniture that are commonly used by many people. The definition of a chair itself is a household piece of furniture that is usually used as a seat, which generally has 4 legs that are used to support the weight on it. Meanwhile, the notion of a table is a piece of furniture that generally has a flat surface and legs as supports, which have various forms and functions. In general, tables are often paired with chairs or benches. So basically a table and a chair are two different parts but their functions are very complementary to one another, so that a table must also be equipped with a chair as a seat. If there is a table without chairs, the function of the table will be less effective or the use of the table will be reduced, especially if the table in question is a table for eating, a table for studying, and a table for work, because of the various types a table that is used for some of the above activities will really need a chair to support the function of the table. On this problem, our group made an innovation, namely making flexible chairs and tables (table chair flexibility) using the anthopometric method. The purpose of making this flexible chair flexibility is to reduce the size of the chairs and tables that are quite large, and can be placed on a small area or place. Because the concept of a table chair flexibility is a chair and table combined into one that has a level of ease of storage and is easy to move from one place to another. As well as reducing the size and chair flexibility table with the tools in it. The development of a chair flexibility table using the anthopometric method is carried out in several stages, namely the first measurement of the physical body of the human body, after that calculating each percentage of each human body size used and finally looking for the exact size that will be used in manufacturing. Physical human bodies that are used include arm length, waist length, half back knee, knee height, elbow height in a sitting position and folded knee.

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II. METHODOLOGY

The process for making a chair flexibility table consists of several steps, including: Determination of Sample Data Sampling data were obtained from members of this group, amounting to 21 people using a questionnaire method. Physical Measurement, Measurements of human physical measurements that will be

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carried out include knee folding, arm length, waist length, half back knee height, knee height and elbow height in a sitting position, Anthopometric Calculations. The calculated calculation is the mean, standard deviation, 5 and 95 percent. In determining the mean, the method of calculating it is by averaging the size of one of the physical human bodies, whereas if calculating the standard deviation the method of calculating it is:

$$SD = \sqrt{(\Sigma fx^2 / N)}$$

Meanwhile, if you calculate the percentage 5 and 95 how to calculate it as follows: Presentile 5th = X-1,645.SD, 95th percentile = X + 1,645.SD

Table 1. Body Size Data

No	Name	Arm in Length	Waist Length	Folds Knee Back	Knee Height	LLTK	Elbow height in a sitting position
1	Alvin Febrianto	80	33	25	60	49	75
2	Mimien Yanuar	65	27	19	30	37	69
3	Deny Puji S	70	30	20	52	40	72
4	Abdul Haqi	75	31	23	55	44	72
5	Alaikal Firdaus	73	31	22	53	43	72
6	Ade Ivan	72	30	23	52	40	71
7	Hilman Fikri	77	32	26	58	44	73
8	Ade Ryan	74	31	24	52	41	72
9	Diki Prastyawan	70	32	23	50	39	70
10	Edi Nasrulloh	71	30	21	50	40	71
11	Eriko Habib	75	32	24	53	44	71
12	Danang Sukma	74	30	24	52	41	72
13	Fikri Rahmawan	75	31	24	53	40	72
14	M Saipul Ansori	76	32	23	52	38	72
15	Denka Pundita	68	30	23	53	39	71
16	Yusril Rizal Abdullch	77	30	23	52	41	69
17	Farid Nur	72	29	22	53	41	70
18	M. Ajiz	78	32	23	54	40	72
19	Ranu Wibowo	73	31	22	53	41	71
20	Mustaghfiri Asror	80	32	23	53	40	70
21	Yayan Sopian	77	30	23	53	40	70

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III. RESULT AND DISCUSSION

This chapter will include the amount of calculations for the anthopometric data and the size of the finalization in making chair flexibility tables, Anthopometric calculations for knee height:

Table 2. Data Calculation of Anthopometry

No	Name	Knee Height	F	(x)	X2	X2.F
1	Alvin F	60	1	7.95	63.24	63.24
2	Mimien	30	1	-22.05	486.10	486.10
3	Deny P	52	1	-0.05	0.00	0.00
4	Abdul Haqi	55	1	2.95	8.72	8.72
5	Alaikal	53	1	0.95	0.91	0.91
6	Ade Ivan	52	1	-0.05	0.00	0.00
7	Hilman	58	1	5.95	35.43	35.43
8	Ade Ryan	52	1	-0.05	0.00	0.00
9	Diki	50	1	-2.05	4.19	4.19
10	Edi	50	1	-2.05	4.19	4.19
11	Eriko	53	1	0.95	0.91	0.91
12	Danang	52	1	-0.05	0.00	0.00
13	Fikri R	53	1	0.95	0.91	0.91
14	Saipul	52	1	-0.05	0.00	0.00
15	Denka P	53	1	0.95	0.91	0.91
16	Yusril	52	1	-0.05	0.00	0.00
17	Farid	53	1	0.95	0.91	0.91
18	Ajiz	54	1	1.95	3.81	3.81
19	Ranu	53	1	0.95	0.91	0.91
20	Firi	53	1	0.95	0.91	0.91
21	Yayan	53	1	0.95	0.91	0.91

Table 3. The Anthopometric data and The size of the finalization

Type of anthopometry	Average	SD	5^{TH}	95^{TH}
Knee Height	52.05	1.57	49.46	54.63
Fold Your Knees	41.05	1.4	38.74	43.35
Elbow Height On Sitting Position	71.29	1.84	68.26	74.31
Back Knee Half Food	22.86	1.53	20.34	25.37
Sleeve Length	73.90	3.72	67.79	80.02
Width Last Length	30.76	1.56	28.20	33.33

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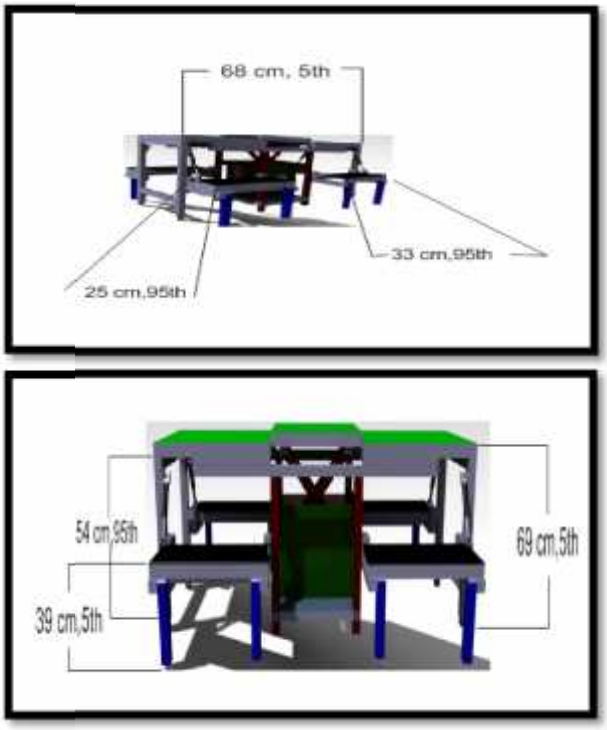

Figure 1: Table and Chair Design

- Mean = $\frac{\Sigma f}{N} = \frac{1}{2}$= 52,05
- Fx = 1093
- SD = $\sqrt{\frac{\Sigma f^{\,2}}{N}} = \sqrt{\frac{5\ ,0}{2}}$ =1,57
- Presentil 95 = Rata" + 1,645.SD = 54,63
- Presentil 5 = Rata" - 1,645.SD = 49,46

The chair flexibility table product design using the anthopometric method to minimize land use, there are several measures that refer to human anthopometry. These sizes include chair width of 25 cm in the 95th percentile, chair length of 33 cm in the 95th percentile, table length of 68 cm in the 5th percentile, chair height of 39 cm in the 5th percentile, table height of 69 cm in the 5th

IV. Conclusion

These products are suitable for use especially Asian people with a height of 150 cm to 175 cm

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