Adjustable Laptop Table with DIY Concept

Zamri Buhari, Nur Hannnani Abd Latif & Shaikh Abdul Karim Yamani Zakaria

Department of Wood Industry, Faculty of Applied Sciences, UiTM Pahang, 26400 Bandar Tun Abdul Razak, Jengka, Pahang.

zamri_buhari@yahoo.com

Abstract

Furniture plays an imperative role in completing human lifetime, as they been widely used, anywhere and at anytime. Functions, design, space, price and material used to build up the furniture were an important features need to be considered by customers. High price and lack of space are some limitations that faced by students at hostel or other customers that live in a small house in buying furniture. This study is conducted to overcome those problem by designing a Adjustablee laptop table with "do it yourself" (DIY) concept for ease of handling and portability, and at economical price. A laptop table is combined with an adjustable book shelves cabinet. Modern and contemporary design were applied to suit with the lifestyle of modern human living. Laminated particleboard and blockboard were used as main material.

Keywords: Multipurpose laptop table, DIY, ergonomics, laminated particleboard, blockboard

INTRODUCTION

Furniture is an important creation towards human life. It is because the furniture plays an imperative role in completing human lifetime. In buying furniture, the important features need to be concerned are such as the design, price and material used to build up the furniture. It also includes a broad range of human body support devices, surface for various activities, storages and display pieces, and partitions designed to help people sit and rest, work and play, organize items, partition space and so on. Design is a process which utilizes both the right and left sides of the brain. Such as, furniture designers must be consider structural, functional, textile, aesthetic, spatial, economy and cultural needs and desires all at same time. Furniture designers learn how to design, sketch, draw, draft, make study models and use computers programs such as Auto-card or Auto-desk while simultaneously developing a working knowledge material, technique and the human body.

Ergonomics is the field of study that seeks to design tools and tasks to be compatible with human capabilities and limitations. It also about an understanding of human beings and human behavior that include anatomy, physiology and psychology. It provides a set of conceptual guideposts for adapting workplaces, products and fit human needs. Conventional ergonomics interventions were framed around relieving stress, improving safety, increasing comfort, avoiding fatigue, enhancing efficiency and etc (MacLeod, 1995). It is very important to be concerned in designing a furniture because the product must be suitable and good feel during used by consumers.

The selection of materials that want to use to produce furniture product is also will give influence to the product. Many types of material can be used in furniture manufacturing such as solid wood, metal, plastic and wood composite or panel product. Nowadays, Wood Plastic

Composite (WPC), Laminated Particleboard, Medium Density Fiberboard (MDF), Block board, and other panel product is very famous are used to produce any furniture product. This is because, this material is economical price, workability, and their surface not need through finishing process.

MATERIALS AND METHODS

a) Design process

The designing process of this Multipurpose Laptop Table with DIY concept is started with case study or survey and will be ended with final product as illustrated by Figure 1.

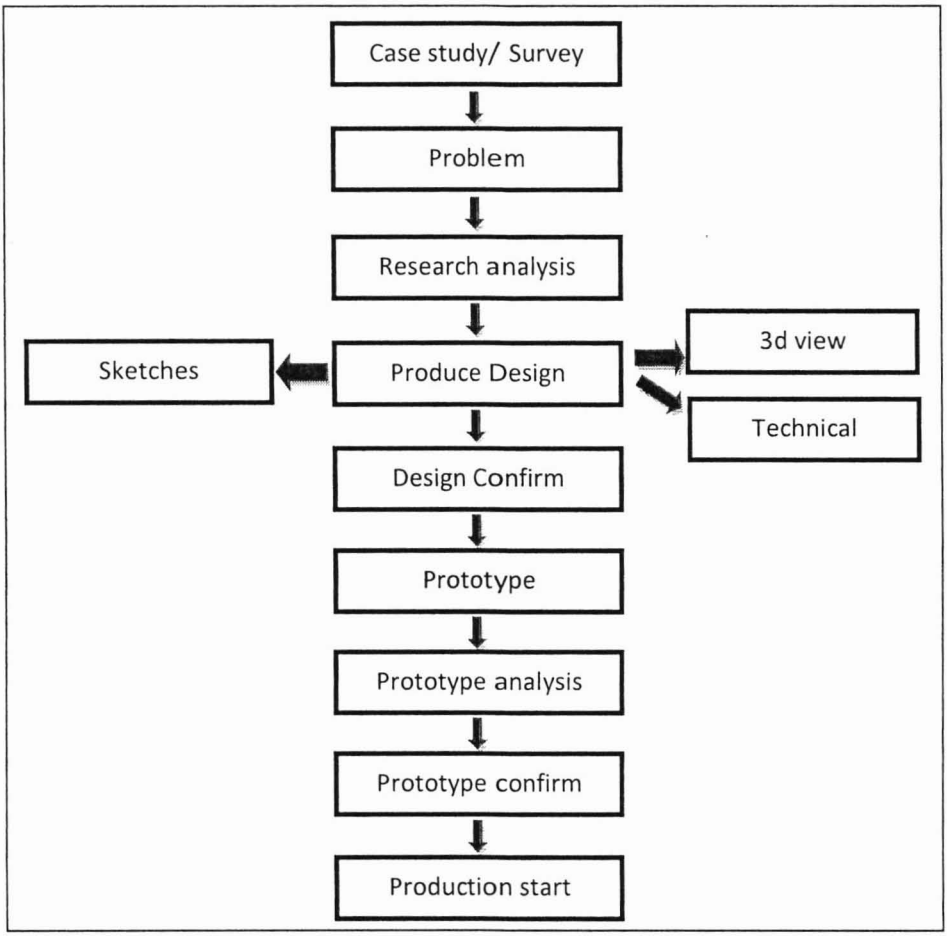

Figure 1: Designing Process

b) Manufacturing process

After prototype confirmed, the manufacturing process of final product was started as refer to the Figure 2:

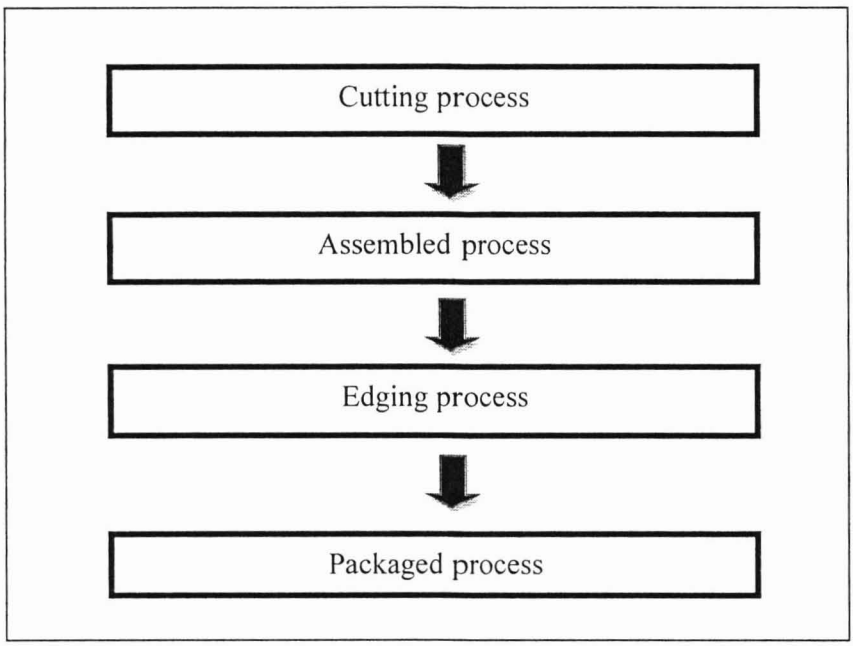

Figure 2: Manufacturing process of product

RESULTS AND DISCUSSIONS

The main objectives of this study is to design an Adjustable Laptop Table using a laminated particleboard and block board with using DIY concept for ease to handling and portability. Second objective is design this product with economical price. The survey with used questionnaires about this product is used as the testing in this study.

Statistical significant

Table 1: Analysis of variance on the effect of sex, profession and age of Adjustable Laptop Table with DIY concept.

variable	Material	DIY concept	Design	Portable	Ergonomic	Limited space	Adjustable for multipurpose	Commercialized	Price
Sex (S)	0.000**	0.006**	0.064^{ns}	0.382^{ns}	0.704^{ns}	0.161^{ns}	0.031*	0.724^{ns}	1.533^{ns}
Profession (P)	1.260^{ns}	0.085^{ns}	0.156^{ns}	0.392^{ns}	1.399^{ns}	0.412^{ns}	4.971^{ns}	0.035*	0.357^{ns}
Age (A)	0.694^{ns}	0.036*	0.657^{ns}	0.143^{ns}	0.220^{ns}	1.726^{ns}	2.145^{ns}	0.568^{ns}	0.066^{ns}
S x P	0.000**	0.003**	2.391^{ns}	2.064^{ns}	1.445^{ns}	2.064^{ns}	7.196^{ns}	1.225^{ns}	1.919^{ns}
S x A	0.000**	0.000**	0.852^{ns}	0.701^{ns}	1.133^{ns}	0.852^{ns}	5.332^{ns}	0.852^{ns}	0.558^{ns}
P x A	0.07^{ns}	0.057^{ns}	0.150^{ns}	0.602^{ns}	0.288^{ns}	0.174^{ns}	1.219^{ns}	0.257^{ns}	0.698^{ns}

Note: *ns – not significant where $p > 0.05$, (*) – Significant where $p < 0.05$ and (**) – Highly significant where $p < 0.01$*

Table 3 shows the effects of sex, profession and age which have been obtained from survey (questionnaires). The results shows that there is highly significant for the effects of sex to material, DIY concept and adjustable for multipurpose and different significant to others dependent. The effect result of profession to all dependent is not significant accept commercialized is significant. The effect result of age to all dependent is not significant accept DIY concept is significant. The effect result of interaction sex and profession is same with the result of interaction sex and age for material and DIY concept is highest significant and different significant to another dependent. The effect result of interaction profession and age to all dependent is not significant.

Discussion each variable

i. The suitability of material (laminated particleboard and block board).

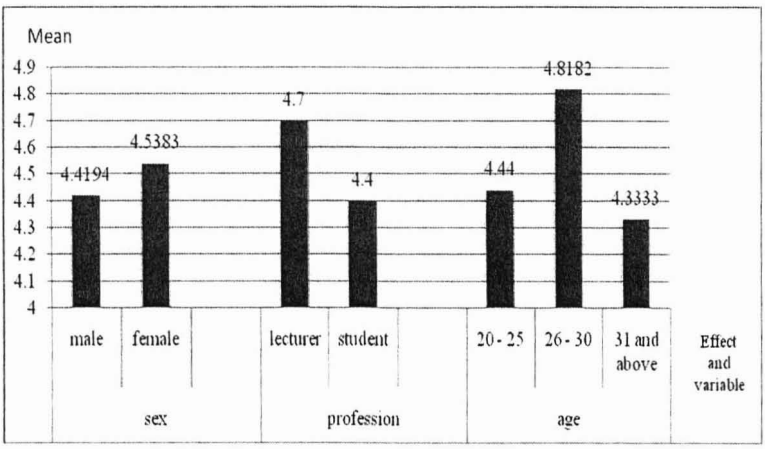

Figure 3: Effect of material that used to produce this product

According to the figure 3 it showed that the correspondent classified the suitability of material been used between 4.3 to 4.8, means almost excellent.

ii. Product produced using DIY concept

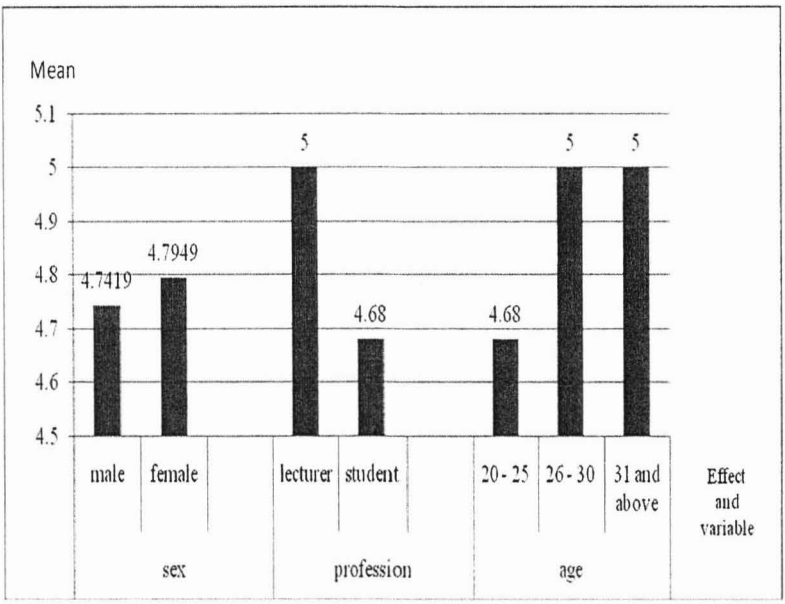

Figure 4: Effect of using DIY concept

The sex and age factor gave different result when evaluating this product regarding on DIY concept. Correspondent at age 26 and above rating the highest, 5 for this product might be because of they previous experience when buying product in a complete product. But this product been packed in separated pieces and can be re-assembled for many times.

iii. Design of the product

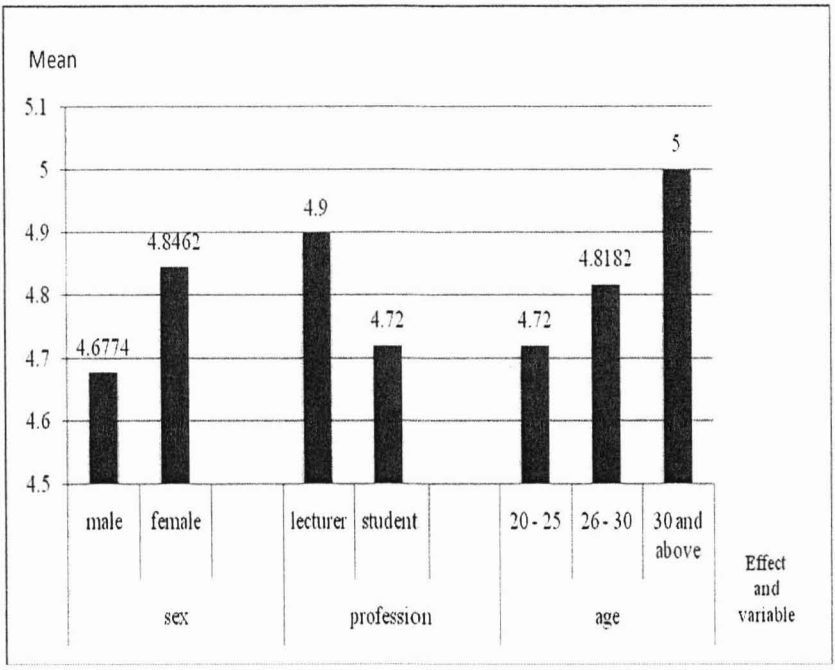

Figure 5: Effect on design of the product

Refer to figure 5, the design been chosen been rated between 4.6 – 5.0 by the correspondent. It showed that the design suitable for sex, all profession and age. The reason is the design been applied was modern and contemporary.

iv. Product is easy to be handle and portable

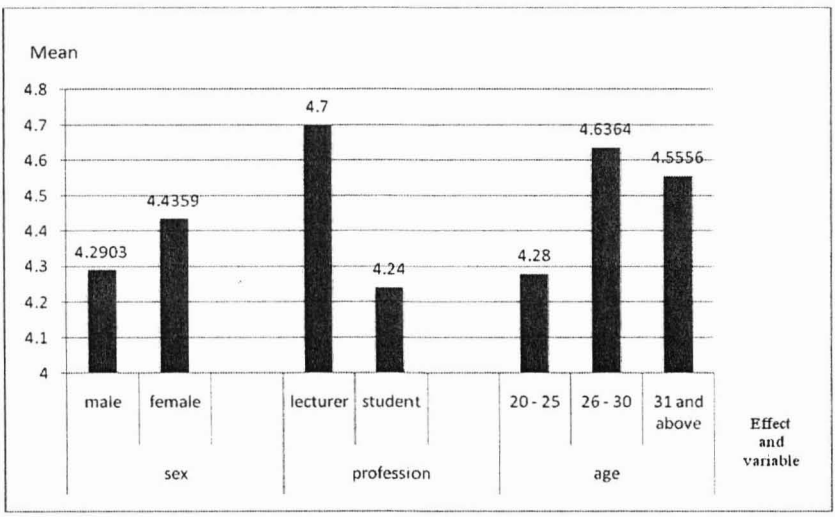

Figure 6: Effect on portable for the product

Figure 6 showed this product is portable, as it is a combination between laminated particleboard and block board and the weight only 11kg.the shape at the table also made it easier to be more at any place.

v. The product been produced based on ergonomic concept

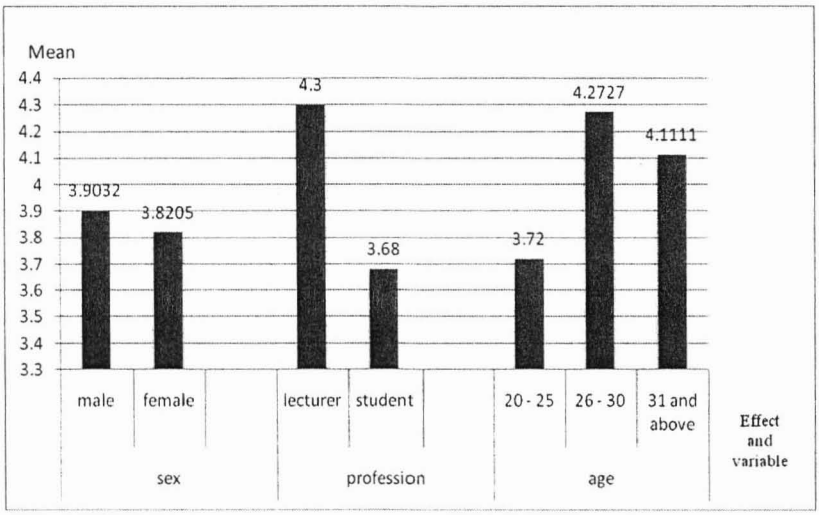

Figure 7: Effect on based ergonomic concept

According to figure 7, the correspondent rating the application of ergonomic concept in this product between 3.68 until 4.3. The student gave the lowest rating as they not really familiar and understand about ergonomic.

vi. The product is suitable for customer that have limited space

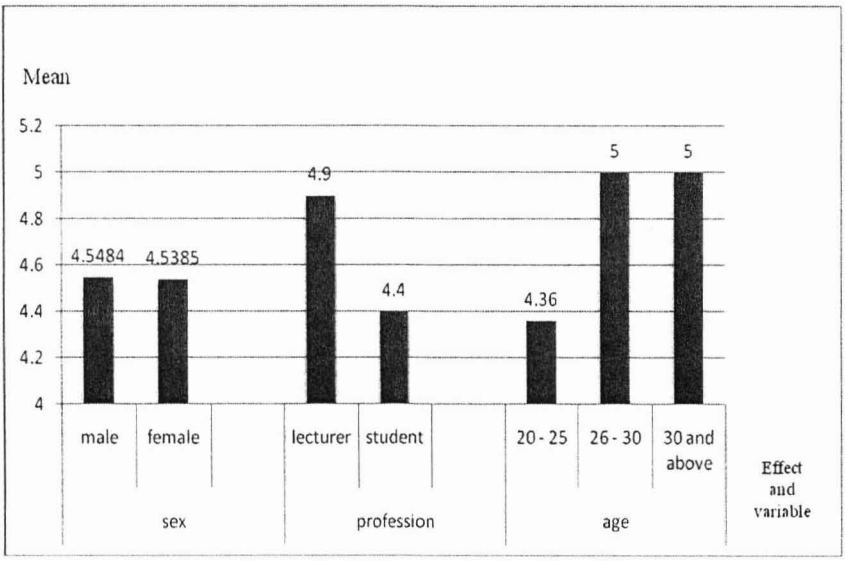

Figure 8: Effect on limited space

The entire correspondent agreed that this product was suitable for customer with limited space, as the adjustable laptop table be combined with book shelve and can be unfix and refax back.

vii. The product is adjustable for multipurpose uses.

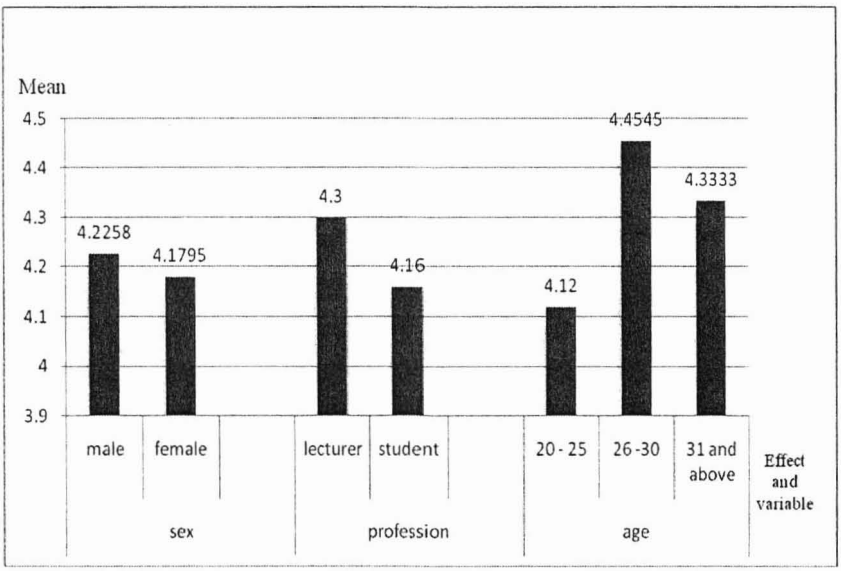

Figure 9: Effect on multipurpose uses for the product

Figure 9 showed male and female correspondent had different perception regarding on the multipurpose use of this product.

viii. The product is suitable to commercialized

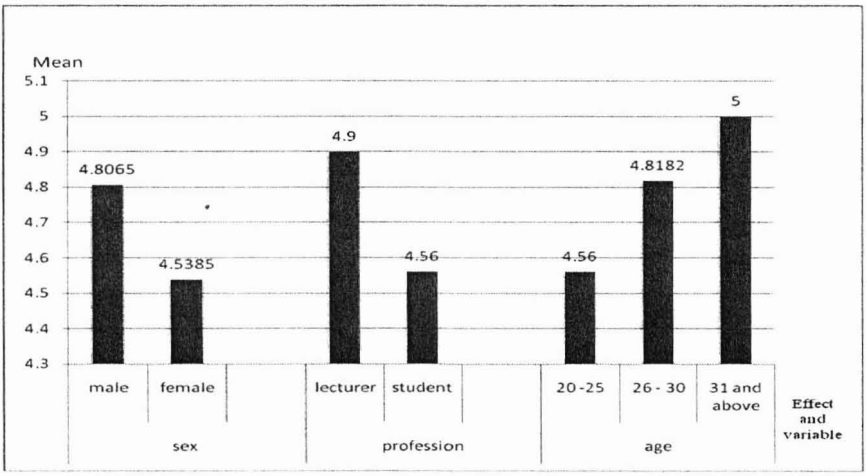

Figure 10: Effect on product to commercialize

Figure 10 showed the product is suitable to be commercialized to everyone, at any age, sex and profession. All correspondents satisfied with the properties of this product.

ix. The price for this product is between RM90 – RM150

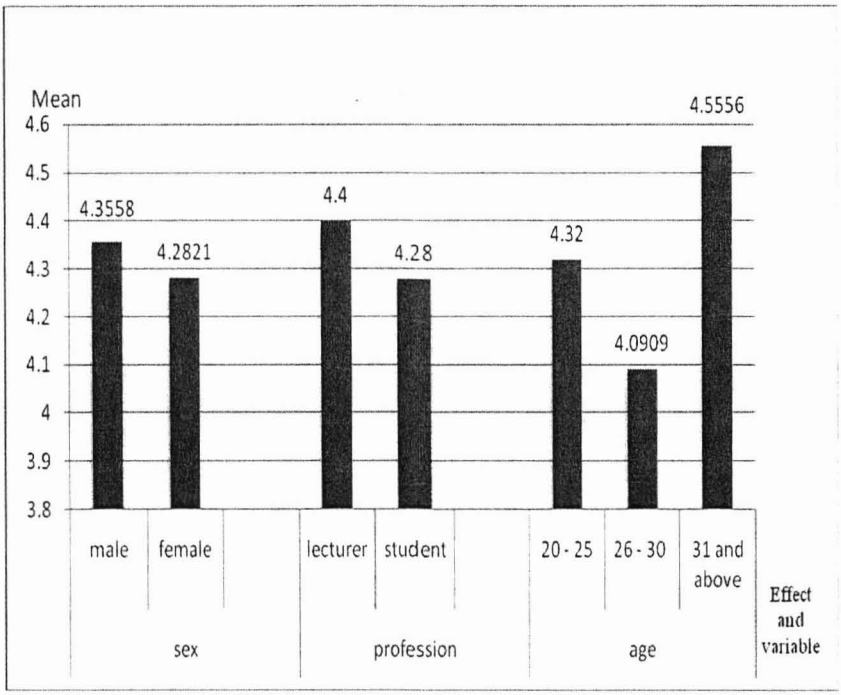

Figure 11: Effect on price for the product

Refer to figure 11, the price between RM90 – RM150 for the product been rated as suitable for all correspondent, with near value between 4 – 4.5. this might be because customer just need to pay RM90 – RM150 for one product but with multifunction use.

CONCLUSIONS

Overall, Adjustable Laptop table with DIY concept is suitable to be commercialized in market as all correspondents either male or female, with different profession and age grading this product between 4 to 5, where as 5 is excellent.

References

Anon. (2007). www.wikipedia.com. Particleboard.retrieve on 26 october 2011.

B. Mustafa Pulat. (1992). Fundamental of Industrial Ergonomics. Prentice-Hall, Englewood Cliff, NJ.

Bridger, R.S., 1995. Introduction to Ergonomics. McGraw-Hill, NY.

Rybczynski, Witold (2000). One good turn: a natural history of the screwdriver and the screw. pp. 79-81.

Sanders, M. S., and McCormick, 1987. Human Factors in Engineering and Design, McGraw-Hill, NY.

Seth Stem, 1989. Designing Furniture from Concept to Shop Drawing: a Practical Guide.

Postell, J. (2007). Furniture Design. What is design furniture. pp. 3-10.