International Journal of Engineering & Technology, 7 (3.28) (2018) 1-4

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper



Ergo-aesthetic approach through senses and behavioral assessment

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Abstract

In general, the concept of ergo-aesthetic discloses the equilibrium of human behavioral character with form, shape, and symbolism inside a designed product. In fact, this harmony synthesis can be achieved throughout responses of behavior and senses inside a design process. Through the adaptation of ergo-aesthetic, humans will be able to achieve greater satisfaction with the designed product as they will positively interact and respond proportionally to it. In this context, ergo-aesthetic principles will replace the traditional method of evaluating and adapting ergonomic and aesthetic into the design process to achieve a better output product. Essentially, ergonomic and aesthetic are fundamental components that need to be considered throughout the design process procedures. The synergy between these two aspects may facilitate in optimizing the efficiency of the design process which will contribute to a higher output quality. Additionally, behavior and culture are also significant as they function as bonding agents for ergonomic and aesthetic to merge harmonically. Thus, implementing ergo-aesthetic principles into design process through behavior and cultural perspectives may lead to the enhancement of the output quality of a product.

Keywords: *semicolon design process; ergo-aesthetic; senses.*

1. Introduction

Specifically, the term 'ergonomic' can be defined as the theoretical and fundamental understanding of human behaviour and performance in purposeful interacting socio-technical systems and the application of knowledge to design of interactions in the context of real settings [1]. On the other hand, 'aesthetic' is exclusively related to form, entirely preoccupied with emotional empathy and completely committed to symbols and icons [2]. As a matter of fact, a few scholars have highlighted the similarities between the assessment properties of ergonomic and the aesthetic in different research areas. However, it should be noted that assessment is highly subjective as social differentiation may affect the evaluation of a person towards aesthetic characteristic [3]. Also, they highlighted the use of a cross-cultural method of form and colour validation as integral elements in the design context. Moreover, sleep position varies throughout the sleeping process while human dimension will provide an indication of the product size [4]. In this respect, researchers have stressed on the need to study the behaviour of user using the product and to examine and finalise the anthropometric data for the ideal product sizing.

Particularly, cultural ergonomic is a framework which involves the combination of human interaction and local culture to create a sustainable culture experience [5]. In this study, researchers have highlighted the synthesis between cultural and ergonomic which conveyed the transition of heritage and traditional values of Taiwanese aboriginal culture to modern consumers and increased the sense of spiritual essence in daily life. Furthermore, furniture users are also required to receive proper training on seating methods although proper anthropometry has been taken into consideration when designing [6]. Interestingly, this article also mentioned the indirect effect of cultural influence on sitting style.

In summary, this study emphasises on the importance of discovering exceptional properties inside human behaviour and senses to further enhance the adaptation of ergo-aesthetic principles in industrial design processes. Therefore, senses and behaviour can be acknowledged as essential elements to establish effective linkage in synthesizing ergonomic and aesthetic into a design process.

2. Ergo-aesthetic definition

Apparently, the ergo-aesthetic term was derived from two broad principles which are ergonomic and aesthetic. With relation to this study, ergonomic is a fundamental aspect where human comfort level and the ability to do a certain task constantly undergo thorough examination and consideration. On the other hand, aesthetic illustrates the beauty of an individual product. Upon meticulous perusal of this context, these two principles contradict each other as one of them discusses the technical aspect of a product while the other presents a subjective evaluation of an item.

With regards to the fundamental contrast between ergonomic and aesthetic, behaviour and culture are also potential media to be assimilated into this theory. Based on the conceptual linkages in Figure 1, behaviour and culture are ideal media to be combined with these two principles while having senses as the bonding element. For instance, behaviour and culture reveal how people react towards an individual product through tangible manners such as touching it, sitting on it, smelling it, admiring the visual appeal or hearing and registering the type of noise from it. Furthermore, behaviour and culture towards an item are generally more personalised in specific regions across the continent. This can be clearly

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observed especially in the eating style of Japan, whereby natives use chopsticks. Conversely, this style may not be suitable for Englishman in London based on their types of food and the skill of using the chopstick itself. Undoubtedly, this illustration highlights the significance of the behaviour and culture of a person which will determine the suitable styling and shapes to be explored, the range of anthropometric data for application and sensitivity towards the rules practiced in that culture. In this respect, the relation between ergonomic and aesthetic throughout a precise application of behaviour and culture of the user is indisputable.

Through the application of the ergo-aesthetic principle, designers will acquire a thorough overview of their product. As a result, users will gain a new and refined satisfaction experience from the product. Additionally, this adaptation will prevent the product from undergoing alienation but instead gain acceptance by parties where culture linkage has been well adapted. In connection to this study, the final product should sound pleasant or does not possess unwanted squeaking noise as this will allow users to gain confidence in the structure of the product. Besides, the product should also have an attractive smell from the material usage (natural wood and leather smell). Moreover, a refined and smooth feeling of the furniture can be achieved by appropriate usage of material and shapes. Also, the standard taste of perfection (an ideal product that meets foods and drinks) should be followed to increase user satisfaction. In other words, ergo-aesthetic will contribute towards a more thorough perspective in developing an individual product.

3. User behavior and preference

User behavior and preference are the anchor in determining an item successful rate. Each design should be based on user's experience and demand. Universal design term may have generalized all item to suite up most of the user's population, but there is a need for a specific behavior centric design to be considered. Design should be based on concrete situations and it cannot be inflexible or an armchair strategy because sometimes an item are derived from one's own life experience and insights [7]. In addition, a perfect design should entirely endow the human experience and lifestyle.

Likewise, behavior of user is affected by the surrounding situation. Human behaviors happen in an environment, which is surround to the standing patterns of behavior and the behavioral patterns are also surround to the environment [8]. For an example, change in humidity and temperature will affect what type of cloth that we are wearing, food that we are eating and even furniture that we are using. This prior research strengthens the fact that user lives in different region in this world will interact differently towards their own unique environment.

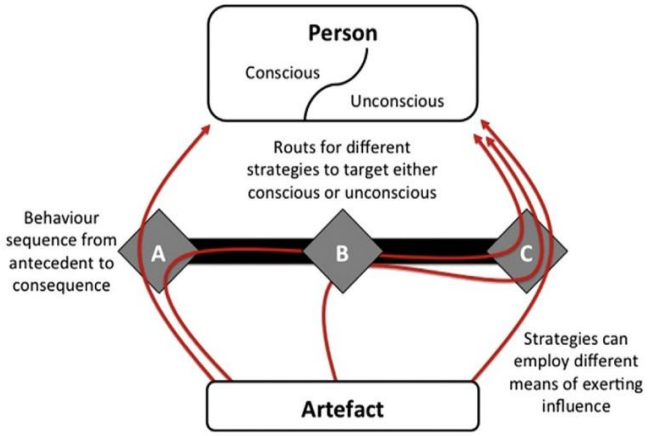


Fig. 1: Element to consider in design for behavior change [9]

When designing, behavior is one of an important criterion that must be consider. In relation to Figure 1, there are 4 different route when involved the behavior change which include antecedent and consequence; conscious and unconscious; and exerting influence. Moreover, the strategies route suggests the important of considering user's background influence, their habit and lifestyle as well as provocation of surrounding towards them. Design for behavior change presents a multi-dimensional problem with a number of interacting elements, which are also culture and context dependent [9]. Unconscious human behavior is still considered a useful value for establishing ideas and understanding human latent needs quality [10]. Above all, this strengthen the importance on extracting external influence that affect user behavior and preference.

4. Ergo-aesthetic, senses and behavior

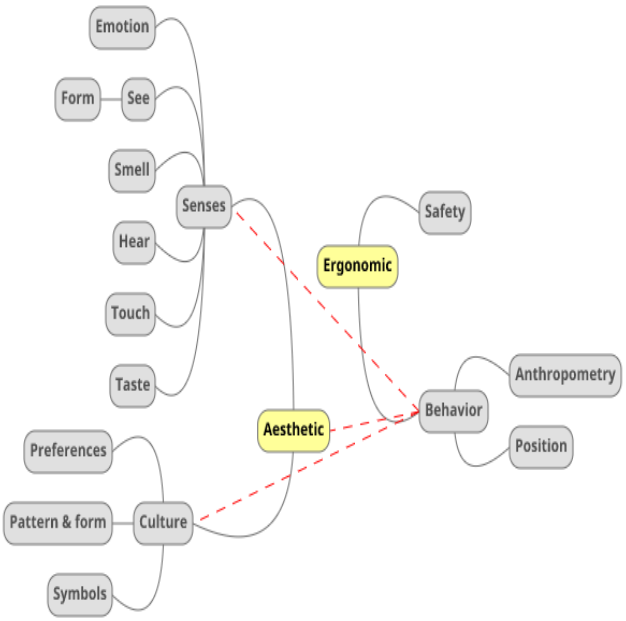


Fig. 2: Conceptual linkages between aesthetic, ergonomic, behavior and senses [3-6, 11]

In the context of ergonomic and aesthetic of a product development, there are significant roles of senses to ensure their properties are properly determined. As reiterated by many [2-3, 12-13], culture is an influential component which may affect the visual communication of a person towards aesthetic characteristic. Specifically, various forms, emotional symbols and icons constitute the significant linkage between aesthetic and emotion. As a matter of fact, senses may be interpreted as the attributes of sight, taste, touch, smell, hearing and feeling. With relation to these scholar findings, aesthetic has been discovered to be essentially connected to emotion which is one of the attributes of senses. In this study, emotion was visualized throughout the input of senses which includes looking, tasting, touching, smelling and hearing (see the relationship inside Figure 2). Therefore, it can be deduced that a market-worthy product is a product that incorporates all the distinct senses with an assumption that the fulfilment of senses satisfaction will rectify the bias between ergonomic and aesthetic.

Next, behavior is the approach of how we react towards the senses receptor. In fact, a few scholars have highlighted the association between ergonomic and aesthetic with behavior [3-6, 11]. With respect to this study, it should be noted that deviations in ergonomic and aesthetic are inevitable as human behavior and culture experience changes constantly. Nevertheless, the application of ergonomic and aesthetic through behavior evaluation inside a design process can significantly improve visual appearance and comfort level of created item.

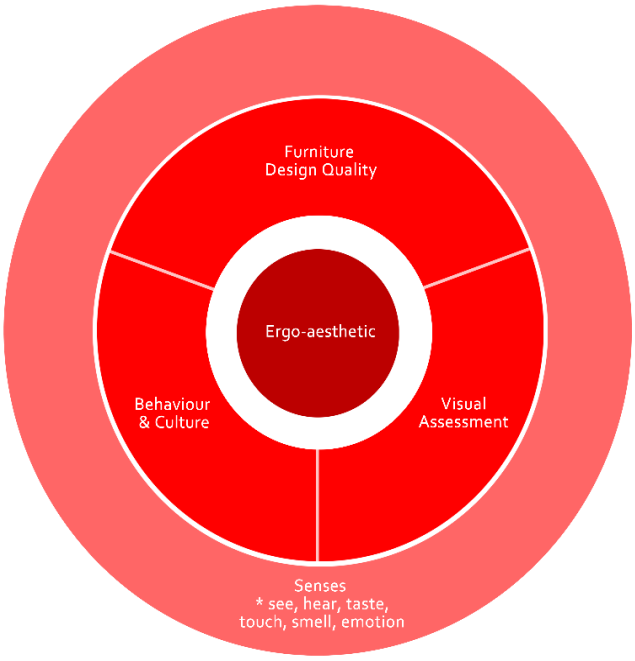


Fig. 3: Ergo-aesthetic framework where senses play a vital role in enhancing the adaptability between ergonomic and aesthetic [3-6, 11]

As demonstrated in this study, Figure 3 illustrates the essence of ergo-aesthetic where senses and behavior; furniture design quality and visual assessment function as the core of the design approach. First and foremost, to obtain a good application of ergo-aesthetic approach, designers should be well-versed with the knowledge of senses contribution in their designed product. Consequently, the senses evaluation will eventually help designers in selecting a suitable shape for their product, the best material for the product strength and enhancing visual appeal or applying a correct anthropometric measurement for the designed product. On the other hand, behavior and culture are equally important in identifying the proper senses attributes level to be applied onto the designed product. For instance, behavior and culture can determine the kind of sitting position that should be used for a chair design. Subsequently, this situation will affect the anthropometric data, the color usage, the shapes of the product and the type of material to be employed.

With respect to this change, this ergo-aesthetic framework also functions as a limiter by minimizing the establishment of unwanted product which is mainly due to the disparities of behavior and culture of interaction towards an item. Therefore, it is crucial for designers to take into consideration all the elements which are senses, behavior and culture, furniture design quality criteria and visual assessment criteria in ensuring the product development stage follows the highest standard by eliminating the undesirable product features.

5. Ergo-aesthetic adaptability

To ensure ergo-aesthetic approach can be applied effectively, both designer and manufacturer must thoroughly consider these eight important suggestions on improving design, manufacturing and business structures which are:

1. Users can generate an interactive furniture based on single images using the interactive modeling framework [14]. The interactive framework may facilitate designer to gain experience and be involved inside the design process, thus evaluation process will be accelerated and simplified. For instance, senses evaluation in ergo-aesthetic approach can be simplified using this interactive modelling framework.
2. Eco-briefing concept which emphasizes on material processing and electrical and power usage should be adopted to enhance the efficiency and ecological awareness among furniture manufacturers [15].
3. Knowledge Management Structure (KMS) is to become the key model to stimulate product innovation rate [16]. In this context, there are basically three main components which are Knowledge Management Culture, Human Resource and alliance within KMS.
4. Placing sole focus on one type of product or furniture, design as the main or part time occupation and stimulation and support of becoming the main key in evaluating furniture design company performance [17]. By focusing on a single product type, designing as the main occupation and ensuring ongoing encouragement and support, furniture design companies are assured of experiencing growth in their business.
5. Socio demographic factors are also influential as they will affect the purchasing behavior of users [18]. For instance, elders are more price-sensitive and less interested in customizing furniture while customers with higher income will lead to the preference of customized furniture. Likewise, the inclusion of customers with higher levels of education will also increase the preference of customized furniture and demand of shorter delivery time. Therefore, it is essential to have a solid grasp on the marketability of a certain product before designing.
6. Preferences of users may differentiate on artistic objects [19]. In this context, the choice of matching an artistic chair with a normal table requires less contemplation or a shorter decision-making time than matching a normal chair with a normal table.
7. Design and working environment should be upgraded and maintained to boost worker satisfaction [20]. Essentially, it is of utmost importance to have an appropriate storage facility, fitting appearance of furniture, feasible office layout as well as personalized authority and individual privacy.
8. Immediate business environment plays a vital role in ensuring the success of the furniture industries [21]. Precisely, linkages between supplier, manufacturer and distributor are acknowledged as significant contributors to a desired business ecosystem without boundaries between material supplier and manufacturer.

6. Conclusion

In conclusion, ergo-aesthetic is a brand-new design concept of how designers can equalize and emphasize between one sense to another taking into consideration the behavior and culture boundaries which are present. As a matter of fact, when senses experience towards the product is optimized, this will be followed by the increase of user willingness to accept the product. In this study, ergo-aesthetic is closely related to the understanding of human behavior and culture differences to stimulate and satisfy the human senses which are sight, hearing, taste, smell, touch and emotions. Essentially, this study highlights on the significance of ergo-aesthetic as a fresh alternative to obtain perfect balance between furniture appearance and comfort level of an individual product. In the process of achieving the desired product, a thorough understanding of local culture and behavior may assist in the adaptation of ergo-aesthetic principles into the design process. For instance, the Bauhaus movement highlighted that function will lead the outlook of an individual product, but the ergo-aesthetic theory will restore the balance between the system and the visual appeal of the product through behavioral linkages. With connection to this study, this approach will also help business industries to reduce unwanted product in the market by identifying and comprehending the culture and behavior demand.

As a matter of fact, this study is in congruent with the notion that adopting the theory during the earlier design stages will save thousand or maybe millions of dollars developing an unwanted product. Additionally, the ergo-aesthetic principle will benefit the industrial design industries where a sensible cultural adaptation into a designed product will eventuate to a higher acceptance towards the

item. Consequently, this will impact the market with an upward trend of that item.

Acknowledgement

This work is supported by the Research Acculturation Grant Scheme, Ministry of Higher Education Malaysia and SGPL My-RA research grant, Universiti Malaysia Kelantan. The authors thank the anonymous reviewers for their constructive comments and valuable suggestions.

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