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Influences of Gestalt Principles in Form-Giving: Industrial ceramics design

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Abstract

Design thinking is a contemplative longing to change the world by exploiting aesthetics, ethics, and knowledge. The designers of design cognition do not adequately clarify which abstract aspects they ponder with their physical condition as the driving force behind producing, selecting, and developing ideas. This research aims to characterise design semantic representation related to form creation. The descriptive and prescriptive studies used for data collection are partitioned in this study. This model specifically designs fields for product design ideation to product form design anatomy. This developed model will psychologically impact the designers in industries and education fields.

Keywords: Product Gestalt; Form-giving; Ceramic Design.

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1.0 Introduction

Professional in design has regularly explained that novice designers need comprehensive design solutions to perform sufficiently. Although it is usually accepted that these novice designers will get plan learning through exposure to design investigation that is ample in many displays, it invalidates this recommendation. The designers themselves struggle to clarify how they make the association that immediate them to be the outcome and why those decisions are rational because the thinking behind design is not entirely comprehended. Besides, novice designers in the current literature on design cognition do not adequately clarify which abstract aspects they ponder or how they connect intentions with their physical condition as the driving force behind producing, selecting, and developing ideas.

According to King, Wertheimer, Keller & Crochetiere (1994), Gestalt theories have implications for education focusing more on meaningful learning and accurate understanding of principles over the traditional structured approaches based on memory and recall. Gestalt is "not a combination of elements, but something new concerning these, which exists together in their combination, but is distinguishable from it" (Lyons, 2001). As interface designers, it should recognise that learners will view the concept even if it comprises well-designed parts. McClurg-Genevese (2005) stated that the concept of unity could be linked to the Gestalt theories of visual perception and the way the brain categorises and groups visual information. Unity describes "the relationship between the individual parts and the whole of the composition" (McClurg-Genevese, 2005). This is perhaps one of the most critical aspects of design. Every designer uses their imagination from the concept of their mind, and it seems there is a significant characteristic of the design process. In current design

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practise, form development from ideas can be transformed into design drawing proposals by using appropriate sketching techniques. Quinn (2007) identifies that sketching and the combination of Marquette making can affect the idea generation.

In exploiting a mix of aesthetics, ethics, and knowledge, design thinking is a contemplative longing to change the world (Nelson & Stolterman, 2003). The designers themselves struggle to clarify how they make the association that immediate them to be the final outcome and why those decisions are rational because the thinking behind design isn't wholly comprehended (Hegmen, 2008). Besides, novice designers in the current literature on design cognition do not adequately clarify which abstract aspects they ponder or how they connect intentions with their physical condition as the driving force behind producing, selecting, and developing ideas (Dubery, 2015). As a reference, Homburg (2015) explores the notion of using the Gestalt principles as a general approach to describe the interactions of the product design process (Figure 1). In this framework, the emotional bond between subject and product, which is characterised through particular semantic codes, affords designers enriching feedback about the product Gestalt, finally leading to improvements in performance and appearance (Parr 2003, Lawson 2006).

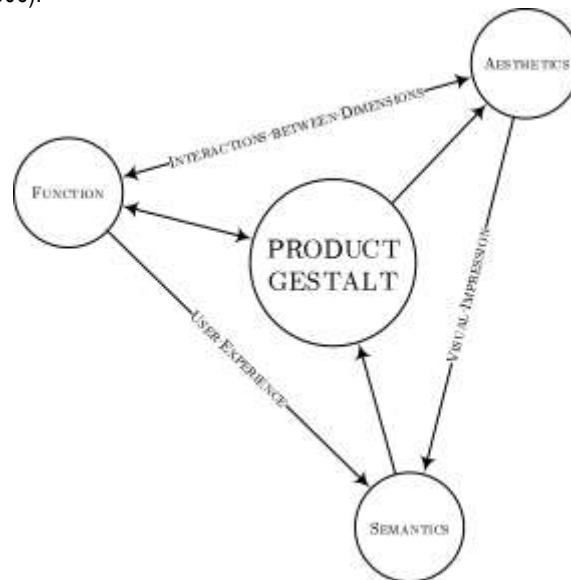


Fig. 1: The three axes of the design process with product form as the nucleus. This work prioritises the Gestalt principles as primary descriptors of the product form and focuses on bridging the gap between aesthetics and function by measuring the effect of these principles on subjects' preferences. (Source: Homburg, 2015)

2.0 Revisit Design Construction and Structural Influences

Historically, the module was used primarily as a standard unit of measurement for proportioning in classical architecture. With twentieth-century advancements in construction techniques, manufacturing and technology, modularity in the arts has developed not only as a tool for measurement but as the use of standardised units that physically combine with each other to form larger structures (Anwar et al., 2015). According to Hur & Thomas (2011), in recent years, there has been a growing interest in the principles of modularity in the disciplines of industrial design, fashion and textile due to benefits such as ease of assembly/disassembly customisation and cost-effectiveness. Modular products provide flexibility and a wide variety of novel and versatile design outcomes that can grow and change easily without affecting the rest of the system. Modular design is a design approach that creates things out of independent parts with standard interfaces. This allows designs to be customised, upgraded, repaired, and parts to be reused. A well-known example of module design is LEGO plastic construction toys (Spacey, J. 2016). Spacey describes the non-modular design as any difficult design to customise or repair. For example, many electronics are intentionally designed, so the manufacturer must repair them. Spacey further explains that modular designs tend to benefit customers and sustainability as they allow for reuse and incremental upgrades as opposed to replacing an entire unit. In many cases, a culture of do-it-yourself customisation will revolve around highly modular designs.

In addition, Stavric & Jablan (2011) describes that modularity will be considered the use of several essential elements (modules) for constructing an extensive collection of different possible (modular) structures. In science, the modularity principle is represented by the search for essential elements (e.g., elementary particles, prototypes for different geometric structures). Different modules (e.g., bricks in architecture or ornamental brickwork) occur as the basis of modular structures in art. In various fields of (discrete) mathematics, the critical problem is recognising some set of essential elements, construction rules and an (exhaustive) derivation of different generated structures. Sarhangi, R., (2010), explains that the evidence of modularity can be seen in medieval Persian art, which clearly shows the direct involvement of mathematicians in the pattern making process. The design making approach of Medieval Persian mosaics portrays the sophisticated geometry in ornamental art where most of the approaches were based on the concept of modular.

3.0 Formgiving Design Influencing Form Development Approach

Creating form formulation needs to investigate the principle of design requirements among the designer, artefacts and users as suggested by Anwar et al. (2015) to aesthetically solve the appearance and consequences of form development. The statement also convinces Bakar (2015) studies that attraction and expression for user and aesthetics plays, a vital role in encouraging users to try the product. A designer is generally considered as creative experts in developing the idea, shape and 3D form. Designers produce important conceptual design for new products and the backbone of R&D for some industries. The creativity understanding limited to only established production and corporate leader team where design success should continue with commercial success and profitable value. Malaysian Industrial Designer recruited from established institution is commonly familiar with Malay design philosophical believe and practice (Abidin et al., 2008; Anwar et al., 2015; Siran et al, 2020). The primary market analysis suggests that only a few local designs R&D output with Malaysian origin become a global product champion for the company although it was developed with advanced and niche technology. Malaysian made design products only contribute to minimum commercial impact and failed to be competitive in the global market.

Design is often seen to be central to competitiveness and delivering value to customers in the 'new economy'. It is understood as including a range of activities that firms perform in the development, branding and marketing of new and improved products, services and processes (Anwar, 2016; Siran & Anwar, 2020). Thus design, in its broadest sense, is where the intellectual content for value-added in production processes is created. Designing a product requires thought, at least in most cases. The thought is a thinking process of transforming an idea to reality and thinking while designing is a heterogeneous process, composed of very different elements. The success of design often involves the integration of many different complementary intellectual assets. Design is understood as a 'knowledge agent' that can contribute to innovation processes. Bertola and Teixeira (2003) stated that design contributes to innovation, both in product and/or process, acting as a knowledge agent by collecting, analysing, and synthesising the knowledge contained in the domains of Users' community knowledge, Organisational knowledge and Network knowledge. There are three stages of thinking process; divergence, transformation and convergence and each of these stages comprise of methods that make designing more manageable. Methods appropriate at this stage involve both rational and intuitive actions and standard errors of newcomers to design methodology is to be far too speculative at this stage and fail to see the point of fact-finding before they take any critical decisions and before they discover what is it, they are looking for.

Exploration analysis to investigate design innovation as suggested by Andrea (2013) acknowledge the importance of qualified human resources in design field where universities and education systems should aware the increasing importance design in coming years as a source of competitiveness for the firms. While Jamaludin (2013) and Anwar et al. (2015) found that it is essential to understand the relationship between basic form and the product character so that designers can achieve the goals of design and target their user by focusing on semantic element and syntactic analysis. The research investigates the local design factor on the influence of ignoring design trend, new material exploration, manufacturing technologies and capabilities towards corporate branding contribute to low commercialisation value and sustainability. The main question of the research directed to how far existing designer creativity led to success in developing innovative commercial products concept. The focus studies also investigate how 3D design form exploration and direction practice being develop without ignoring commercial, corporate value and succeeding competitive products (Anwar et al., 2020). This research will be the new thinking platform for local design expertise of Malaysian product design who play an essential factor elevating performance and contribution in Malaysian Industries and provide new direction for the Design Education policy in Malaysian Higher Institution which could be improved strategically to aligned with the Industrial Development especially the New Economic Model and NKRA direction.

4.0 The Hypothesis of Ceramic Design Gestalt

The purpose behind this study is to assess product form design as far as the points of view of Product Gestalt theory. A contextual study will be directed to represent the practicability of this proposed model. In addition, this model can be connected to related design fields and product design to product form design (see figure 2). For industry, an imaginative procedure that includes complex visual discernment is product form design. To manage issues concerning the consumers' psychological preferences toward product forms, it is vital to build up an effective decision support system for designers. It is suitable to apply these standards in evaluating the quality of product form design as Product Gestalt theory gives an essential perspective on visual perception. At the same time, this research could have an impact in establishing a descriptive model of ceramic design protocol through Gestalt Principles in Semantic Design Representation and critical ceramic design situations.

The protocol design of ceramic gestalt principles through semantic design representation module develops psychological impact to the designers in industries and education fields. This module concerns the consumers' psychological preferences toward product forms. It is vital to build up an effective decision support system for designers. It is also suitable to apply in evaluating the quality of product form design as Product Gestalt theory contributes an essential perspective on visual perception. Consequently, there are three proposed hypotheses to explain the observations.

H1: The better comprehension for innovation product design in critical design situations can be introduced if the CONSISTENCY phenomena of the design specification in the essential shape development can be resolved among ceramic designers.

H2: The design thinking process towards product gestalt in industrial ceramic can be resolved if the SELECTIVITY design approach can be inspected.

H3: The final product design with development technique of designer thinking process and protocol can be verified if the designers may structure ceramic design to COMPLETENESS.

Thereby, the design process approach proposes the development of principle design structures focus on the ceramic industrial design perspective, characterise design semantic representation in design related to form creation. The design thinking and design process as a tool for ceramists to characterise the affordance-based design method for innovative product design in critical design situations and empirically test the design thinking process towards product gestalt in the industrial ceramic design process.

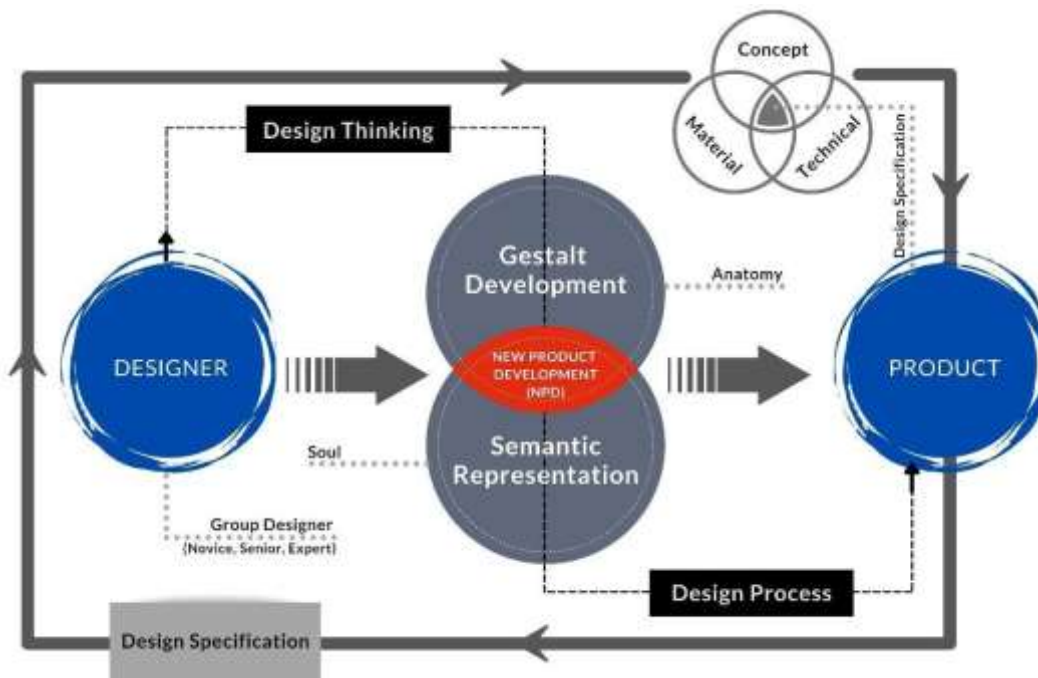


Fig. 2: The conceptual framework of new product creation through gestalt development and semantic representation

Diagram (conceptual framework) in Figure 2 indicates how the process of identifying a design activity in this research to find out about the design thinking process towards gestalt development and semantic representation, especially in the industrial ceramic design process. Moreover, the conceptual framework identifies the relationship of three elements: concepts, material, and technical as a design specification. The implementation of three specifications is based on studies by Nilsson (1998). He addressed in producing product design especially in the specification, it has to comprise the process of material and technical, therefore is supported by research from Anwar. Where several ceramic designers have been investigated in their case study and mentioned to be consistent with what Nilsson claimed, on the other hand, it's more of a concept, material, and technical research approach. (Anwar, 2015). The priority study of this framework is thru design thinking and design process through gestalt development and semantic representation that would be a method for product design creation in a critical situation. In this context, it can be considered how groups of designers with different levels of design thinking, enhance and implement gestalt with semantic factors in the creative development process.

5.0 Result and Propose Model Towards Industrial Ceramic Product Gestalt

Gestalt laws of perceptual organization was the most influential early proposal written about the theory, though Köhler's discussion of Physical Gestalten, it is also contains many influential ideas of a subject. Hence, establishing the conceptual framework of product creation using gestalt theory has underlying one of the most important ideas behind the product principles in industrial ceramic perspectives, and it is not only focuses on visual perception as main principle. In industrial ceramic design, it obviously highlight, the ceramic designer determine product meaning by provoking product development through design semantic representation. It is however, influenced by the ceramic gestalt principle that associates with concept, material and technical.

Based on the perspective of industrial ceramic, a design concept is a brief description of the idea behind a product's planned design in product management. According to some experts (Quinn, 2007; Anwar et al., 2015; Siran et al, 2020), it describes the soul or essence of a product design. It also can be referred to as a product elevator pitch. As far as a design concept is concerned, the hierarchical model of concept classification includes three levels of concept [1] the superordinate concept; [2] the basic concept; and [3] the subordinate concept, which is the most specific. In practice, both verbal and visual play as integration processes in creating the product gestalt. Verbal, the words used to describe the sophisticated elegance and have a tendency to be abstract. This stage focused on the message designers thought design is attempting to convey. While visual is a particular image or color scheme and is typically more concrete. Industrial ceramic designers derived from the verbal component of a design concept to converge into visual concepts are more concerned with how to convey their message.

On the other hand, material design plays another role in creating product gestalt in industrial ceramic design. It is broadly defined as design that addresses the structural, aesthetic, and functional behavior of materials based on product type or function. The interface signature (surface treatment), includes all required data types of raw material or known as the recipe. Material development models that are detailed and include all methods, attributes, dependencies, and associations to form structure. The specific design of the material recipe used by a component and how the material will work. The concern factor in creating a product through material perspectives determine by the capability of architectural ceramic form remains the physical characteristics. This includes water absorption (or porosity) commonly used measure of maturity. Significant change cause of drying shrinkage, drying performance, fired porosity and shrinkage and fired color and character, linked to a specific design of raw material and formulation of the recipe. Plasticity, assessed by comparing workability including drying capability also requires the green strength that can influence very high drying shrinkages if significant plasticizer additions are used. Because the target temperature range can be narrow, a stable firing parameter and control method is required. Characteristics on the surface. The most vitrified surfaces are the most pleasant. That means the recipe must include as much feldspar as possible.

The last element influencing ceramic industrial product gestalt is the technical factors. This element is close to the operational procedure of design for production. The consideration of technical influence has always referred to several concepts known as; [1] One Off Production. Where a designed artifact or design was made to the specification demand of a user; [2] Batch Production. A batch number of design creations fabricated at one single time. The design might be revised slightly and the number of designs or products re-manufactured before discontinuing and being changed; [3] Mass Production. An extensive number of products are manufactured, often implemented in a production line. The same concept might imply on continuous production was similar to mass concept except, that it never stops; and last but not least [4] In Time Production. Where the materials are supplied to the factory house just in time to be utilized and made into products. Once products are delivered, new materials come in to continue the production.

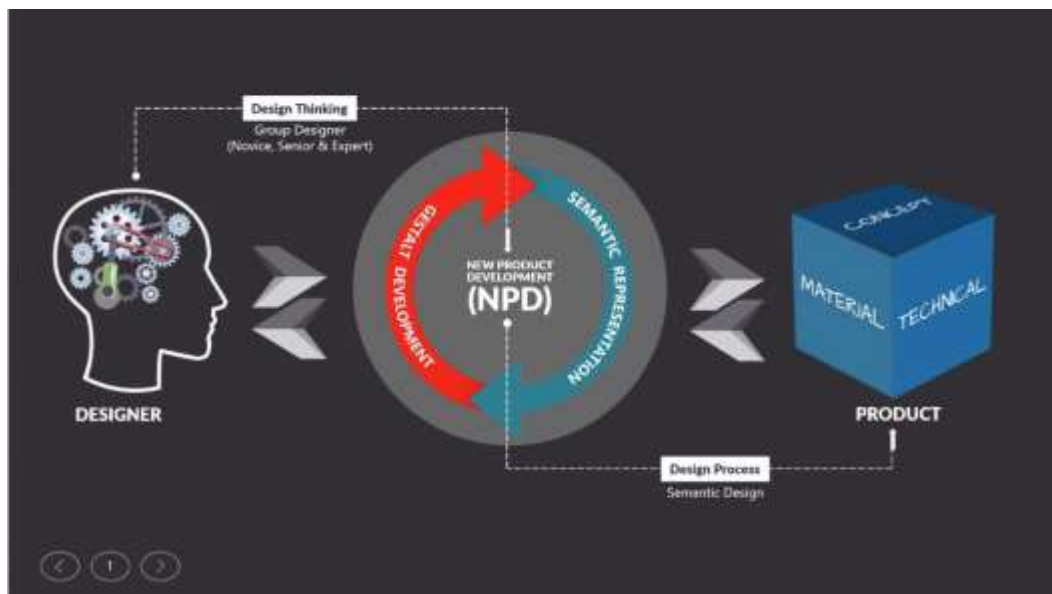


Fig. 3: A proposed method of creating product gestalt in Industrial ceramic perspectives

Industrial ceramic designers apply the 'six principles' (Similarity, continuation, closure, proximity, figure/ground, symmetry & order) commonly associated with gestalt theory. The concerning factor has also been determined by three other factors (concept, material, and technical) in developing a product gestalt. From this point of view, the designer provokes the new product development by fragmenting the important requirement before integrating it into a product gestalt. It is however, there will be a different strategy arranged based on the different career of development (experience) as other factors of decision making. Figure 3 shows the methodological approach to a designerly way of thinking typically for industrial ceramics. During the development of a new product, the designer can only initiate a complete product as a whole with inclusive experience handling the ceramic gestalt (concept, material, and technical). A designer with intuitive design thinking or a designer with a very convenient way of crafting ceramic products has to undergo the divergent or convergent process of creating a product gestalt. This convergent-divergent process meets in the middle of the development process and at this point in time called convergent-divergent ceramic gestalt.

6.0 Conclusion and recommendation

Based on the research identified in this paper, it is hoped that this model can be connected to related design fields and product design for form design creation. A design is an interplay between what a designer needs to achieve and how the designer satisfies the need (Suh, 2005). It is a creative process, but that led to a principle-based process. However, it is challenging to find the proper or specific design principle used while developing the ideation, development till the idea ultimately construct. In conjunction with this discussion, Abidin, Sigurjohnsson, Liem, and Keitsch (2008) define how the form-giving effect in design is essential. In design, it leads to understanding the

physical principle; of how the character can influence shape and form. It starts from a technical perspective and finds a way to understand structural stability; shape and element; force and moment. Form-giving can additionally be an activity to organise the possible and necessary forms (and sizes) for the complete assembly and the components (Hubka & Eder, 1996). Design usually engages with development, and it describes some activities that help develop the concept and ideas to their fullest potential. This process needs to be a rigorous and rewarding process through ideas investigations.

For industry, an imaginative procedure that includes complex visual discernment is product form design. It is vital to build up an effective decision support system for designers. This research could impact establishing a descriptive model of ceramic design protocol in critical ceramic design situations. This protocol design that will be developed will have a psychological impact on the designers in industries and education fields. Understanding how a design is perceived and interpreted is a crucial asset a designer must possess. The designer cannot possibly influence human perception with the designs if they don't understand the driving forces behind them. This study will share the basic principles behind Gestalt, a psychology movement that evolved to understand how to make sense of the design product. Design thinking needs to continuously develop new products and innovate existing ones to stay relevant in today's highly competitive environment.

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