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LEARNING FROM COGNITIVE PROCESS OF VISIONARY MALAYSIAN ARCHITECT ON GENERATING CREATIVE, NOVEL ARCHITECTURAL DESIGN IDEAS

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ABSTRACT

Architecture is one of the disciplines that involve creativity within its core designing activities. Creativity occurs through a process when a person uses his/her ability (mental and physical) to generate design ideas as solutions that are novel, practical and valuable. This investigation focuses on the design process and principles of the expert and visionary Malaysian architects, which is Ar. Hijjas Kasturi and Ar. Serina Hijjas. In this investigation, the architects were interviewed on their design experiences while dealing and solving complex problems of architectural design. The initial findings indicate that these architects shared common traits of dynamic principles with other master architects throughout the world of creativity and expertise in architectural design. Such principles are considered exemplary design thinking tools that can inspire students and young architects to be more creative and innovative.

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1. INTRODUCTION

Architectural Education in Malaysia is still in its infancy compared to a more established institution, especially in Europe and America. Architectural education in Malaysia started in the 1960s after the establishment of the Malaysia Architectural Board (LAM). Since the formation, Malaysia's architectural education shaped local talent that suits the government vision of 'Nation Building' during that time. Before that, the locals need to study abroad such as in Europe and America under the government's initiative to create local talent because most pre-independence buildings were designed by the British. After they came back from abroad, most of them practice extensively design government buildings in creating modern Malaysia. Those who venture into academics helped set up the foundation of the local architectural education system that suits the local context and demand. Subsequently, thousands of local architects have been produced mainly to fulfill the growing demands of the construction industry parallel to the country's rapid development.

However, there is a jarring gap between fresh graduate students and experienced architects in terms of generating creative ideas. This is mainly due to the lack of exposure to the experienced practice architect during the study. Unlike artists from previous generations, skills and knowledge were handed down to apprentice or disciples in which the method of generating ideas and how to execute in creating their artwork. With this method, the disciples can avoid recreating mistakes that have been experienced by the master thus further speed up the learning process. Architectural education nowadays is thought through syllabus which is recognised by MQA and the board, hence the connection between students and real experienced practice architect is lost and hinder the development of the students. Graduates later need to learn from experience until they develop their own individual guiding principle or style.

In tackling the issues, an interview was set with two of the most prominent architect in Malaysia, Ar. Hijjas Kasturi and his daughter, Ar. Serina Hijjas. They are the main subject of this study that will be the leading experts in identifying the common traits of generating creative design ideas. The input of the two generations of local architects can be a valuable insight on how to also incorporate the traits and experience into the local architectural education model.

Students nowadays are not exposed to the architectural guiding principle and primary generator of developing creative ideas since the local architectural education model seldom incorporate the input or direct involvement of an experienced practising architect when engaging with students. The students also constantly rely much on the social media aspect in terms of finding suitable images as preferences, without knowing the credential of the images chosen. These would soon lead to students blindly follow the building without learning how ideas are generated in terms of designing the building that they replicate.

The paper aims to learn from these visionary architects to identify the traits and components in what makes a visionary architect. This paper also would identify the design process and methods used by the expert architects that would become principles of incorporating the qualities into the architectural education model.

2. LITERATURE REVIEW

In determining the traits of guiding principles, several components are broken down to understand and analyse the possibilities and outcomes of having these traits in the architectural field. All these components and traits are vital for architects to build up the source of the primary generator for creative ideas, to create better solutions for the design. These attributes are selected based on the novelty and greatness associated with the architects with the traits. These architects were either received awards or recognitions on their projects or portray characters that could become an example to students and young architects. Other attributes such as passion, confidence, teamwork, and leadership; are all the important traits that any architects must acquire, where it cannot be taken lightly. But these do not portray a remarkable, outstanding architect. To further understand the meaning and the function of these attributes, several architects are linked to each component to understand the function of every trait.

2.1 COGNITIVE PROCESS

Decision making is one of the fundamental cognitive processes in the field of architecture by which a preferred option or course of action is selected from among a set of options based on certain criteria and aspects. (Wang, 2017) To model a cognitive process adequately, it is vital to understand

the linkage of the mind limitation, such as attention span and memory; with the imposing of the environment, such as site information and cost of operations. This is vital to generate some solutions and then test these possible solutions. (Newell, 2008) In this matter, it would become a problematic approach if there are too many possibilities if there is no guidance or experience. (Thomson, 2013) That is why it is important to have as many experiences and explorations in order to create a better design in the architecture field. One of the great master architects who portrayed this method of cognitive thinking is the American architect, Frank Lloyd Wright. He is considered as the founder of the 'organic architecture'. (Zbašnik-Senegačnik, 2014). The application of the term organic to architecture implies that architecture is analogous in various ways of living organisms. It has been taken to mean that, as with living organisms architecture is shaped by environmental conditions such as climatic, geographical, social and cultural. This interpretation of the organic concept leads to notions of architectural regionalism. (Zbašnik-Senegačnik, 2014) The concept derived here were developed after much consideration and through the various cognitive process, which had led him to become a renowned architect himself.

2.2 CREATIVITY

Creativity is part of fundamental elements to all academic disciplines and educational activities, not just the art itself. In the world of architecture academia, it plays a huge role in determining the potential and capacity of a student's designing process. According to Kamylyis and Berki (Runco, 2012): 'Creative thinking is defined as the thinking that enables students to apply their imagination to generate ideas, questions and hypotheses, experimenting with alternatives and to evaluating their own and their peers' ideas, final products and processes.' (Gerlovina, 2011). In order for these students to have broad creative thinking, it is necessary for them to establish knowledge to help them formulate their own understanding, imagination and other aspects. 'One cannot think creatively unless one has the knowledge with which to think creatively. Creativity represents a balance between knowledge and freeing oneself of that knowledge' (Johnson-Laird, 1988, p.207, cited by Wolf, 2015). An example of a master architect who played with this such verb is Santiago Calatrava, a Spanish architect. He has designed multiple unique and iconic buildings, in which all of those buildings had different sources of inspiration from different aspects of life such as human figures, derivation of nature's creativity, and experimentation of materials and their properties. This proves that to achieve this level of design thinking, one must possess creativity and well-generated thoughts. As a structural engineer himself, Santiago had embodied an explorative venture into aesthetical aspects in buildings to the maximum limits rather than the application of the structural approach, which is quite a rather contradictory to the norm of the position.

2.3 EXPERTISE

The Merriam-Webster Dictionary defines an expert as 'having, involving, or displaying special skill or knowledge derived from training or experience.' In the field of architecture, the study of expertise involves applying concepts and methods of practising in the industry from some areas: problem-solving, learning and ergonomic, to name just a few. The study of expertise provides a focus for basic research on many phenomena of cognition, such as memory limitation, primary generator, and reasoning biases. (Hoffman,1996) These experiences, either positive experience or the contrary, would then developed architects to become experts in the field. This would usually come through after a certain period, depend on the amount of experience earned. A renowned architect, Kenzo

Tange, a great Japanese architect, shares these traits. He was part of the think-tank that created the ideology of metabolism in Japan (Xue, 2014). The movement, which drew the attention of the international architectural community in the 1960s, with its radical and visionary urban and architectural schemes targeting a sustainable society (Lin, 2007). Kenzo Tange and his group of architects and other professions deployed several experiments and studies first before presenting the ideology. Without any experience and expertise from other backgrounds and fields, this Metabolism idea would never be envisioned nor visualised.

2.4 INSPIRATION

Architecture finds inspiration in nature. John Ruskin, a famous architect, once wrote in '7 lamps of architecture', that 'forms which are not taken from natural objects must be ugly'. Analogies between man-made artifacts and living organisms have been a persistent theme in Western throughout the millennium. This can be seen during the period of the Egyptians, Greeks and Romans incorporated natural motifs, such as tree leaves, into their columns. A legendary architect that shows a great example of this trait is Antoni Gaudi. Today he is admired by both professionals and the general public, in which his masterpiece, the Sagrada Família, is one of the most visited monuments in Spain (Giulia, 2010). The Sagrada Familia is a good example of using functional forms from nature in the solving of constructional problems: in which Antoni Gaudi used columns that modelled the branching canopies to solve static problems in supporting the vault. As a Spanish Catalan, he incorporated Catalonia's natural beauty and rich history into his buildings. The clever use of geometrical structures inspired by such curves that would produce shapes in the form of trees and flowers. It is not casual that all these inspirations in perspective do temporally coincide with the great revolutions that Science and Technology had across the Century. Therefore, in the current scenario, the prophecy of architecture lies to the young generation of architects that should be inspired by these great predecessors.

2.5 ARCHITECTURAL PRACTICE

Architectural design requires an immense amount of information for inspiration, creation, and construction of buildings. The process from the initial conception to the finished product involves substantial knowledge and involvement of multidisciplinary consultants, such as architects, engineers, and planners and others. Architecture both defines and is defined by social, cultural, political and financial constraints: this is where the discipline and the profession of architecture meet. Traditionally, an architectural practice in term of management has been perceived as the administration of contracts and offices, rather than the management of projects and practices. Like many other organizations within the construction industry, the labour market upon which architectural practices draw is regulated by The Malaysian Board of Architects (LAM, 2019) which supervises from the educational level to the operational level of the architectural practices. This is a process of standardisation of skill through the professional formation, which means that when clients purchase the intangible service, they also know to what standards and procedures the service would be supplied. Failure to meet these standards and procedures opens the professional to charges of negligence (Winch, 2006).

3. METHODOLOGY

This study is primarily based around the method of interviews with the Malaysians prominent architects, Ar. Hijjas Kasturi and his daughter, Ar. Serina Hijjas. Both of them had dedicated their

lives to create and design iconic buildings in Malaysia and other countries as well. Iconic buildings associated with them are Menara Telekom, Menara Tabung Haji, and Sasana Kijang, with both architects, had received multiple awards and recognitions between them. It proves that the subject chosen is well versed in their field and become the most suitable candidates, to begin with. This interview is done qualitatively as this is an explorative study, with the results of this being collated in a document and reassessed for any valuable points to be taken. The interview seeks to find out the architect's ability in generating ideas to solve the complex problem of architectural design as well as exploring his expertise in this field of profession. The interview was conducted in his office in Jalan Sultan Ismail, Kuala Lumpur. Sets of questions were structured beforehand, and a two-hour interview was executed. Discussion

4. FINDINGS

Based on the interview carried out, Ar. Hijjas Kasturi and Ar. Serina Hijjas has developed their own individual guiding principle, with different understanding and perspectives, even from their close blood-relation. It proves that architectural education prepares the way of thinking for these young architects independently and exclusively in which they should further develop themselves through experience by practising in architecture firms and involvement with society.

The guiding principle for Ar. Hijjas Kasturi is conformed by his experience throughout many eras of the Malaysian architectural scene in the late 80s. He concludes that these young architects are pressured by the economy during the early stage of their careers. The constraints that they bear upon them leads to rigidity in design and lack of creativity. Therefore, most fresh graduates tend to follow the current architectural fashion as required by society.

Architects matured mostly at age 40 when they have found their guiding principles and have the bravery to execute their ideas to the society/client without the fear of being rejected. They also believed not to follow the architectural trends which involve in façade treatment, building materials and spatial planning, instead believes in the own individual design brief requirement such as site surrounding and clients background by each project's criteria.

4.1 LEARNING PROCESS

The process of maturing in design always starts with education. However, architectural education should be emphasising at

- Creating a holistic education and embrace all kind of knowledge (or exposure)
- Nurturing creativity and encouraging imagination
- Develop the useful skill to the career such as good sketches and usable and practical knowledge
- Encourage students to give opinion instead of finding information (especially through Google)
- Emphasising on the grammar of design by having critique sessions.

(Johannes, 2001; Demirbas, 2003; Lukman, 2011)

4.1.1 COGNITIVE PROCESS

It is apparent in the statement by Ar. Hijjas that designing process is a complex problem-solving process that architects or any product designer need to overcome in order to create good design products. Visionary architects show that the requirement of knowledge and ability to seek correct information and in an efficient manner is vital in tackling various design issues. With experience, architects will develop a sense of rational thinking and understanding of the environment in which

expedite the design process compare to early career.

“First is knowledge of course. So among the knowledge, what is the knowledge required. Second is a skill, what skill they required. The third is an attitude, what kind of attitude is required. And another is discipline, what kind of discipline they required. These are the main themes.... The other one that they want is exposure.” (Ar. Hijjas Kasturi)

“You Google the things. But, it is not enough. You can get from people doing something that is not enough that only information that all for me knowledge after that you got to go around economics no matter what you build.” (Ar. Hijjas Kasturi)

“He got to know all his geometry. If he does not, if he cannot calculate, he cannot. That what I tell you the fundamental trigonometry 3, 4, and 5. If you don’t have that, you can’t form it. These are all rational. You got to know about the earth. How the earth formulates.” (Ar. Hijjas Kasturi)

4.1.2 CREATIVITY

As mentioned by Johnson-Laird, in 1988, ‘Creativity represents a balance between knowledge and freeing oneself of that knowledge’. Therefore, these architects understand the fundamental of the design before incorporating the knowledge into their design process. They are equipped with terms and architectural lingo as they progress further into their career.

“Architect is the creator of space. Economics is the economics of space. To make sure the best use of space the minimum, the most economical way.” (Ar. Hijjas Kasturi)

‘The language of architecture. You talk about nomenclature. Nomenclature and language of architecture are two different things.... We, every architect talks differently, are they thinking differently? No! They speak the same thing. The trend is different...because they are modern people.’ (Ar. Hijjas Kasturi)

“First is the grammar of design; the fundamental grammar of design.” (Ar. Hijjas Kasturi)

4.2 EXPERIENCE THROUGH PRACTICE

Common traits developed through experiences are:

- Considering the economics of planning, economic of using materials and economics of everlasting thing (maintenance method, cost, and image)
- Styles commonly influenced by the people (style and client)
- Considering the historical aspect of designing instead of raw ideas
- Style change through exposure along with time
- They developed the philosophy and aesthetic unique to the individual
- Designing with local context and availability in mind.

(Billet, 2013; Schwartz, 2012; Maranzano, 2005)

4.2.1 INSPIRATION

Inspiration changes over time due to style, trend or local context. However, the design still considers the historical aspect instead of exploring raw ideas. They believe that as architects progress

into their careers, they will develop the philosophy and aesthetic unique to the individual.

“Knowledge and historical change. They are changing, the way we were working that we were merging things that the way we were merging everything on the internet.” (Ar. Serina Hijjas)

“You have this that influences your work and then evolve to what I see the work is change...” (Ar. Serina Hijjas)

“We always look at heroes anyway. They inspire. Whether Calatrava, whether Norman Foster, we look at it. Something in them is good. They talking about their work, not their life.” (Ar. Hijjas Kasturi)

4.2.2 EXPERTISE

As they progress within their career, both Ar. Hijjas Kasturi and Ar. Serina Hijjas understands the challenges faced in the construction industry. They evolve throughout the era influenced by the trend, the client’s intention until they are strong and mature enough to influence the client on what they want to do.

“There is the economics of planning. The economics of using material and the economics of everlasting things” (Ar. Hijjas Kasturi)

“Every piece of work is a process. Just like the architecture process, the large piece does inspire for the next is a sense of the process.”(Ar. Serina Hijjas)

“I wanted to model it like a Bauhaus. That is what I wanted. All I wanted all to be one so they can learn each other. Not only to learn each other, they have what they call it, togetherness.” (Ar. Hijjas Kasturi)

4.2.3 ARCHITECTURAL PRACTICE

“Today is democratic. People tell you what to do. The people make the architect. The people there that going to buy the thing, they are the ones that do that. But, you have influence over each other. Sometimes, the architect so strong. He tells the client what to do.’ (Ar. Hijjas Kasturi)

“.... you got to be exposed to the industry, you got to be exposed to the manufacturer, and you got to be exposed to the architect.... you must have exposed to books; you must have exposed to magazine...” (Ar. Hijjas Kasturi)

“The architect can only bloom at least when they are the age of 40 and above. Then I can tell you, in the beginning, they are just sustaining, they just (practice) to get more and absorbing more knowledge.” (Ar. Hijjas Kasturi)

5. CONCLUSION

This study can be concluded that to create or generate design ideas as solutions that are novel, practical and valuable; one must possess a great scale of creativity. This creativity can be adopted by

several methods, such as through experiences, and learning from the experts. These methods are lack in the educational system nowadays, which brings us to the main issue of having young generations of architects being lack of creativity. The literature study carried out was the quality and traits of many great architects have, including the mentioned architects. It was evident from our reading, and our interviews, that this explorative study does not solve the problem of the creativity level of the young architects, nor the educational system applied for architecture. This paper suggests that the disciplines and ways of thinking of these architects played a bigger role in finding creative solutions for the design, that lead them to become who they are now today.

This study shows that these two prominent architects had their ways of thinking and solving the problems, which could have become part of the methods being applied in the education syllabus. Instead of having images and pictures as the main references, young architects must also learn to read and appreciate the qualities of spaces and study reasons behind the development of the buildings that they used as references. This study has shown that there is so much more to explore and to improve in our architectural industries. The challenge is to find a way of making a better understanding of creating excitement and unique architectural perspective, viable, teachable and, ultimately, of worth to the architectural student to follow, learn and adapt, and to do this without losing creative and innovative.

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7. DATA AND MATERIAL AVAILABILITY

Information can be made available by contacting the corresponding author.

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