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How does concept transform into product? An appraisal of analogy-based design practices in architecture education

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Abstract

When defining the concept of ‘metaphor’ as ‘an intuitive abstraction of uniqueness in diversities’, Aristoteles also creates a common-sense in comprehending analogy-based design processes. Therefore, as in all design practices, drawing analogies - with/to/between- by generating metaphors is also an important tuition for learners/students in architectural design education. Starting from the question of ‘how a designer’s initial concept is transformed into an architectural product’, this study generates a discussion on architectural thinking and designing practices based on analogies, aiming at creating perspectives with regard to architectural design education which primarily intends to improve students’ designing abilities by providing the sustainability of current environmental data through the subsequent designs. In this education, the students are firstly directed to reveal metaphors in their specific studying areas by gathering inspiration from directly formal and physical environmental data or from indirectly informal and contextual data; and secondly expected to transform analogies into spatial decisions with architectural programs. In this sense, this study is methodologically carried out in two sections. The first part analyses the stages of the process that lead students from concept to product in the education of architectural design by emphasizing the relational potential of design by considering analogies/metaphors. In the second section, six student studies/products selected from design education studios are appraised in context of the metaphors they captured in their study areas and the analogies they created –or in other words, the reasons they asked for to design-. Among the consequences of the study are the inferences to be made on how to transform design practices, in which the students interrelates between environmental data, into architectural products.

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1. Introduction

According to German architect Oswald Mathias Ungers (2013), scientific discoveries consist of seeing analogies where others only see plain phenomena. In this context, according to Ungers artists who think and design through analogies and metaphors pave the way for more creative thought processes. Just as architects such as Antoni Gaudi, Mies van der Rohe, Bruno Taut, Rudolf Steiner, Frank Lloyd Wright and Le Corbusier highlight the unifying role of designing through analogies while metaphorically using in their designs the bees, who represent ideal society, division of labour and organized work, and the bee hives, which are created with harmony and balance by them (Ramirez, 2000). In this context, according to Kant the analogy that builds a similarity between two phenomena that are different from each other is *sine qua non* for widening knowledge; and, according to Ungers (2013) creating new concepts and contexts is only possible by thinking while setting up analogies.

Thinking and designing by drawing analogies through metaphors, therefore, has been a powerful path finder in uncovering the different starting at periods where even Aristotle was attracting attention. The metaphor defined by Aristotle as an 'intuitive abstraction of uniqueness in diversities' (Ungers, 2013) is a formulation that occurs where two different thoughts function together according to French philosopher Paul Ricoeur (1981) -or it is a vehicle used in the expression of a description by being transferred to a different object (Broadbent, 1973)-. In this context, it creates a change of meaning and interaction in the term where it is used (Boys-Stones, 2003).

In this context, it can be said that drawing analogies between things/objects by generating metaphors is also a method of expression/creation in architecture practice as in all design practices. Therefore, as in all design practices, drawing analogies -with/to/between- by generating metaphors is also an important tuition for learners/students in architectural design education. Starting from the question of 'how a designer's initial concept is transformed into an architectural product', this study generates a discussion on architectural thinking and designing practices based on analogies, aiming at creating perspectives with regard to architectural design education which primarily intends to improve students' designing abilities by providing the sustainability of current environmental data through the subsequent designs. In this education, the students are firstly directed to reveal metaphors in their specific studying areas by gathering inspiration from directly formal and physical environmental data or from indirectly informal and contextual data; and secondly expected to transform analogies into spatial decisions with architectural programs. In this sense, architectural products are required to be evaluated as a result of the dialogues in between every single student and his specific study area.

This study is methodologically carried out in two sections. The first part analyses the stages of the process that lead students from concept to product in the education of architectural design by emphasizing the relational potential of design by considering analogies/metaphors. In the second section, six student studies/products selected from design education studios are appraised in context of the metaphors they captured in their study areas and the analogies they created -or in other words, the reasons they asked for to design-. Among the consequences of the study are the inferences to be made on how to transform design practices, in which the students interrelates between environmental data, into architectural products.

2. Process -going from concept to product- in architectural design education: Extracting information from place, linking one to the other through metaphors/analogies, generating architectural products

Throughout architectural design education students are expected to understand the current context of the place that is worked on and to generate an architectural design that can be integrated with this context. In this sense, the design problem faced by students during the education process can be defined as how the context of place can be transformed into an architectural product. During the solution process of such a design problem, students are directed to perform an in-depth analysis aimed to understanding the context of the place they are working in. Understanding the context of the place also requires revealing the superposed information that is hidden in the place. This information contains, in addition to the physical and terrain specific features of the place, its historical, cultural, social, geographical and even its climatic, natural, experiential features. The context of the place is the total of all these phenomena; it is hereditary and is constantly being transformed. Therefore, students are directed to consider the architectural product they will design in relation to their conceptual and abstract characteristics in addition to the

concrete characteristics of the place they are working in. Thus, context analysis requires the reading/evaluation together of these phenomenons that appear independent from each other.

The context of the place contains countless associations and metaphors. In this sense, where a context analysis that appears to be bottomless will be finished depends on the associations and metaphors the students acquire during this process. Such a context analysis is transformed into an architectural product as the analogy of the metaphor the students generated concerning this context. The metaphor captured at this stage of the design process is the state of the context of the place that is revealed and conceptualized; and based on how the context is understood, it is modified. Therefore, the analysis process of the context of the place is based on the mental and perceptual processes of the person to perform the analysis, as much as the qualities of the place to be analysed. Subsequently, the architectural design problem turns into a state that is related to which metaphor the student captures and how he conceptualizes it. In conclusion, this is a causative process of the student's design through the metaphors, where it must be indicated that metaphors are transformed into an architectural product in the design process with two types of analogies¹:

The first type of metaphor brings about the result of the analysis of a concrete phenomenon/a physical environmental data and is transformed into an architectural product through an analogy that is not based on abstraction. In other words, a metaphor whose origin can be directly grasped -in fact even seen- generates a product through an analogical similarity that carries its own physical characteristics. In this manner, what the student sees is related directly with what is in his mind.

The second type of metaphor comes about as a result of an indirect and conceptual analysis. In other words, these types of metaphors, whose origin is the description of an abstract concept, idea or situation, are generated as a result of the revelation of a quality embedded inside the context; in this sense, they may not be grasped -and seen- directly. The analogy to be drawn in the transformation of such a metaphor into an architectural product carries the semantic characteristics of the metaphor -more so than the physical features-.

In conclusion, every student displays his own personal -concrete or abstract- metaphor starting out from the qualities of the place he worked on and generates an architectural product from this metaphor -either through a first or second type of analogy-. In other words, depending on the metaphor generated every student interprets the architectural product with a different understanding. Therefore, the architectural product is related to how the context of the place is grasped and what type of metaphor is generated; and is the requirement of a setup created with metaphors.

3. Six student studies from architectural design studios: the metaphors they captured and the analogies they created

When Ludwig Wittgenstein (1998) describes the world as the total of the phenomenons -rather than things- he seems to have presented an approach that can also be adapted to architecture. In this sense, the place that is worked on is a whole that needs to be understood with all the phenomenons it contains rather than just the buildings surrounding it. This approach that can be adapted from Wittgenstein shows itself in a discourse of Egon Ernest Bergel (1996) in relation with the city. According to Bergel, the city must be considered as a cluster constituted by the relations between the elements, rather than a pile where unit elements or geometric forms are integrated. At this point it must be indicated that metaphors are originated as a result of the analysis of the total of phenomenons expressed by Wittgenstein -or of the cluster mentioned by Bergel- and converted into an architectural product. In this sense, in this part of the study six student projects selected from studios where architectural design education is provided are opened to evaluation in the context of the metaphors they captured in their study areas and the

¹ The concepts of analogy and metaphor in architecture have been classified in various manners: While Peter Collins (1998) splits the analogies in architecture into four as 'biological', 'mechanical', 'gastronomic' and 'linguistic', William J. J. Gordon (1961), who is a psychologist splits them into four as 'personal', 'direct', 'symbolic' and 'fantastic'. Anthony C. Antoniadis (1992) splits metaphors into three; 'intangible', 'tangible' and 'combined' metaphors. Meanwhile, according to Lakoff and Johnson (2005), although metaphors are divided into three as 'orientational', 'ontological' and 'structural', this is not a true division. According to them, many metaphors are orientational; all metaphors are ontological and structural.

analogies they generated. Figure 1 expresses the metaphors and projects that the first three students had, while Figure 2 shows the metaphors and projects of the second three students.



Fig. 1. (left) layers of history; (center) one line, one plane; (right) waves in the sea.



Fig. 2. (left) incoming-outgoing trains at the first and last station; (center) heptagon/7 sides; (right) the Walls of Istanbul, waves in the sea.

3.1. *Layers of history: Museum for archaeological findings in the excavations of Theodosius Port at Yenikapı [by Duygu Kırıçoğlu©]*

The project area is the archaeological excavation area at Yenikapı where the Marmaray Station is also located. During the excavations performed in this area archaeological findings from a wide historical interval ranging from the times when the Sea of Marmara had not yet formed to the Roman, Byzantium and Ottoman periods were reached; meanwhile, the port of Theodosius, considered to be one of the oldest ports of Istanbul was uncovered along with a large number of sunken ships. The metaphor disclosed upon such a context is the historical layering at the archaeological excavation site. The suggested museum design is like a metaphoric opening of the historical layers that came to light with the excavations: Each historical layer is a story in the building. As in an archaeological excavation, the museum grows towards the bottom of the ground. The circulation layout in the museum starts with the present day at the top level; and continues with the exhibition of artifacts from older periods towards the lower levels. The metaphor is based on an abstract and hidden thought and, interpreted with a subjective analogy.

3.2. *One line, one plane: Museum for archaeological findings in the excavations of Theodosius Port at Yenikapı [by Kemal Serkan Demir©]*

During the museum design considered for the exhibition of the findings coming out from the Yenikapı archaeological excavation site at the Theodosius Port, the information inside the urban isles was arranged as a metaphor. In this sense, the lines/contours surrounding the isles in the city were examined to create a prototype; then, the museum building was interpreted with a structural analogy similar to this prototype. Throughout the project process it was aimed that the museum could behave as a continuation of the urban integrity and that the linear and planar traces coming from the urban isles could reach the sea shore through the museum design. The museum

appears to have been born from the city and to have flowed back into the city. Thus, it can be said that the metaphor is based on a tangible/concrete and objective feature and interpreted with a subjective analogy.

3.3. Waves in the sea, Ships on the waves: Museum for archaeological findings in Yenikapı excavations of Theodosius Port at Sütluçe [by Anıl Gümüşkaynak©]

The museum considered for the exhibition of the findings coming out from the Yenikapı archaeological excavations was planned in Sütluçe, at the junction of the Kağıthane and Alibeyköy streams, where they pour into the Golden Horn. The structural character of the ship findings uncovered during the excavations constituted a basis for the shaping of the metaphor in the project. In this sense, each one of the buildings designed for the project appears as a ship abstractly drawn. The ships/buildings appear as though rising among waves in a stormy sea. As a result, concrete and objective two metaphors are transformed into space with an aesthetic and poetic analogy.

3.4. Incoming-Outgoing trains at the first and last station: Interpretation centre of Turkish culture [by Lara Rooke Elvira©]

The project was planned in the area next to the Historical Train Station at Sirkeci/Eminönü. It was discovered during the preliminary process when the context was analysed that the project area was the start/finish point of the 'Divan Road' coming from the Topkapı Palace that was thought to exist during the Roman period. It was considered that such information extracted from the historical context of the place could create a metaphor for the project and this conceptual metaphor was coincided with a second -more tangible- metaphor. The second metaphor is the linear movement produced by the trains while moving back and forth on the railroad tracks. It was intended for the architectural product generated with the interpretation of these two metaphors to be shaped as though it were defining the start/finish of the Divan Road and to make the linearity of the motion on the railroad track feel. Thus, it can be said that the metaphors captured in this context are planned with an emotional and aesthetic analogy.

3.5. Heptagon/7 Sides: Yedikule culture and concert area-Yedikule gardens [by Beril Erdoğan©]

The project area is adjacent to the Yedikule Dungeons, in between the Historical Istanbul Walls and the train tracks. The metaphor was sought inside the Yedikule Dungeons and it was intended for the new building to behave as though it were connected to this old structure. In this sense, the formal and semantic associations of the heptagonal geometry of the Yedikule Dungeons defined a metaphor for the project. Moving from here, the seven sides of Yedikule were transported to the study area; they were exploded, distorted and brought back together -by being made intangible-. Furthermore, the newly designed structure desired to be crushed and go underground next to the monumental Yedikule. Therefore, the structure grows towards the underground. It can be said that all the formal and semantic associations coming from the old structure were transferred to the new structure by the student.

3.6. The Walls of Istanbul, waves in the sea: City hotel and workshop area in Yedikule [by Didem Özkızılçık©]

Designed across the Historical Walls of Istanbul in Yedikule, in the area where the former leather factories are situated, this project interpreted the two elements that border the area as a metaphor: Historical city walls as an artificial threshold and the sea as a natural threshold. In this sense, two equivalent directions are felt in the shaping of the project: There is a direction to the historical city walls in the east-west direction, to the sea in the north-south direction. On the one hand, these two directions were intended to reinforce each other's impacts, on the other hand, they were expected to be different from each other -as much as the natural and artificial-. In this sense, it can be said that the two tangible/concrete metaphors were interpreted in a free, aesthetic and poetic manner.

4. Discussion/Conclusions

According to Ungers (2013), the same way that the meaning of a sentence is different than the meaning of the total of its words, it is also different to see a series of phenomenons as a characteristic whole, rather than the sum total of its components. When the singular meanings of the phenomenons come together, they carry a different meaning in as a whole. In this sense, an architectural product cannot be reduced to a whole consisting of the components coming together one by one. Similarly, the place upon which the architectural product will be constructed must be seen as an integrity that is different than the total of the phenomenons it contains.

The students in the architectural design education are encouraged to enter into a dialogue with the context of the place -in the preliminary process when the surroundings are analysed- and to produce some feelings towards this place. This dialogue is aimed at discovering all the phenomenons in the place; and, at the end of this discovery the students are expected to transform a metaphor they derived from the context of the place into an architectural product. During this process, each student derives his own specific/subjective metaphors from the context of the place which is a series of metaphors, and interprets them as architectural products with a personal analogy.

The metaphor (Antoniadis, 1992) ensures that a concept/object is grasped better through an analogy and assists the transfer of the relations in a concept/object to another concept/object. Therefore the metaphor assists the forming of a relationship between two things -that are in unequal status- and to create similarities. In this sense it facilitates the establishment of a relationship between the context and architectural product during an architectural production process, thus constitutes the thought at the basis of the orientation and shaping of the architectural design.

As much as in the grasping, concretization and description of the context, metaphors are also important intermediaries in its transformation into an architectural product. This is because they are the thoughts ensuring the communication of the context with the architectural product. In this sense, they create an architectural grammar in the transformation of the idea/concept into product; they fill up this grammar with form, content and context.

To summarize, according to Ungers, the meaning of thinking and designing through analogies and metaphors is deep: In this manner, transition to more creative thinking methods may be made, thinking with qualitative values rather than quantitative data may be carried out and more synthesis than analysis is performed. In this sense, based on the deep belief of British philosopher John Ruskin that architecture may also be transferred metaphorically, the encompassing role of drawing analogies and thinking with metaphors in the design process must be emphasized. Metaphors allow the establishment of creative relations between the present and the past. They are neither completely real, nor completely abstract; it owes its potential to being this much indeterminate (Wheeler and Whiteley, 1992). As Alan M. Olson (1980) also indicates, metaphors that are used for the redefinition of reality -rather than just embellishing language- also provide a transition concerning the status of reality for architecture. As a result, although they are not directly a building tool, they are a good tool for analysis and enquiry (Whiteman, Kipnis and Burdett, 1992).

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