



## **DEFORMATION - ANALOGICAL – METAMORPHIC APPROACH TO THE UNDERSTANDING OF DESIGN WITH ARCHITECTURE STUDENTS**

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In recent discussions on architectural education, the importance of learning through discovery is increasingly emphasized with regards to creativity. Learning through discovery is far from all kinds of conditioning, memorization, imitation and replication. Through the support of deformation-analogy and metamorphic methods, this study aims to elaborate on the following issues concerning design and approach, which a student may encounter during the course of discovery: “which approach to use”, “its position in designing” and most importantly, “Where to discover what?”

**Keywords:** Design education, Deformation, Analogy, Metamorphosis.

### **Introduction**

Students in Turkey come to receive education of architecture from pre-undergraduate educational programs based on repetition and memorization. The students coming from this background, as a result, fall apart from questioning and creative thinking system. Thus, within the continuity of education of architecture, it becomes even harder for the student to grasp the process of creative thinking. In the ‘architecture studio’ which is where the quantitative knowledge based student group in Turkey encounters the education of design, the student’s understanding the process of design, ability of self-expression and learning thinking; consequently, the student’s ‘state of knowing what he is designing’ within the education of architecture carries great importance.

With this study, the answers which could be given to the student’s question of ‘How can I reach to an idea of design?’ are searched. Accordingly, with this study:

- The student’s ‘Which way to follow?’
- ‘What to discover where?’ questions are supported with deformation- analogical and metamorphic approaches.

Thus, while it is aimed to prepare the necessary background for the student to devise free and creative designs, at the same time, visual- verbal (philosophical definitions) presentations at the first stage of the design could be integrated with deformation, analogical and metamorphic approaches.

Designers not only can follow a method, but also can come up with a method of their own. They can change the architect method, develop it or try different methods for each design as well.

Hence, Louis H. Sullivan explains the decoration method he used in his book “A System of Architectural Ornament” which was published in 1924. His student, Frank Lloyd Wright, has made use of geometry for the purpose of creating an exactly authentic American style instead of abstract symbolism

(Jormakka, 2012). While designing the frontage of Stretto House, Steven Holl has used the technique of visualizing a musical idea which belongs to two leading artists of Bauhaus, Wassily Kandinsky and Paul Klee (Jormakka, 2012).

Le Corbusier has tried systematizing the ratio method in his work called *Le Modulor* which was published in 1948. Afterwards, he has tried the Fibonacci technique which has developed by obtaining a third number when two consecutive numbers are added.

Alvar Aalto is generally known as the leader of an architectural style which is opposed to method. However, Demetri Porphyrios, who is an architect and theorist, has analyzed the architecture of Aalto thoroughly and asserted that he has a certain method of creation, which is “heterotopia”. Another characteristic of Aalto’s heterotopic designs is that a variety of style and regulation is used in order to emphasize the venues that play host to the most important functions. Aalto describes his own design approaches as a “play” (Urbach 1998).

As it is seen, architects are able to put forth their styles by using a present method or developing a unique method by themselves. By using deformation- analogical and metamorphic methods which are thought to be the most comprehensible and applicable in the beginning period of education of architecture, with this study being carried out, architecture candidate is aimed at being able to use;

- a) presenting the communication of the structure with its physical environment and its identity (analysis)
- b) continuing the design studies with the approach models which are chosen (synthesis)
- c) using the method they developed or other methods in designing process.

## Literature Review

### a) Deformation Approach and Process

Deformation (deterioration of the form) method is an approach based on the first state of the form reaching a new geometry without losing the level of recognition by deforming the form in hand. The outcome is a new and different form from the product in the beginning, yet it carries the traces of the main model. Generally, it means processing the main geometrical forms like a sculpture, changing and shaping it according to the intended visual and semantic effects (Onat, 1995). It is possible to deform an object, article or form by knowing it well.




The more knowledge and effort it requires to draw a geometric line, the more observation, hard-work and experience it requires to deteriorate that geometry, deform it and describing it with the deformation in the mind of the examiner. Otherwise, forms that are not analyzed, not investigated and not studied will come out; consequently, an unsuccessful deformation will occur (Table 1).

Characteristic features;

- first of all, the most important and remarkable feature is that details are excessively used and these features are done more clear. It is not expected every detail to stand out.
- The forms are not expected to become disguised. While saying the geometry of its original form, aesthetic concerns start to arise.
- Designing approach might be inspired by the transformation of geometric forms just as it might be inspired by the nature.
- The process of occurrence of form might include reduction, articulation, explosion, smash, straining and shrinkage.
- The period of decoration of the style brings about the change processes. The new form carried some traces of its original form but its discourse has been altered. Deterioration assigns new meanings to the form.

The usage of computer assisted design tools in contemporary works of architecture has enabled the deformation approaches to find more areas of application. This technological development has increased

the usage of three-dimensional perception by architects. Arnheim (2002) has put forth the idea that the key point becomes deformed in three-dimensional perception. According to this idea, deformation decreases the simplicity in visual coherence and increases the intensity; thus, it increases the tendency to simplify the perception. It causes a chaos which can be overcome by moving the objects to the three-dimensional projections that are structurally simpler.

<b>Table 1. Samples of deformation approaches</b>		
		
Turning Torso Malmo Santiago Calatrava (1)	Seattle Central Library Rem Koolhaas (2)	MIT Stata Center Frank Gehry (3)
In the process of reaching from form to form, it is reduction, articulation, explosion, straining and shrinkage process.		

**b) Analogical Approach and Process**

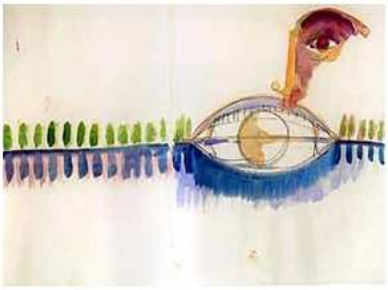

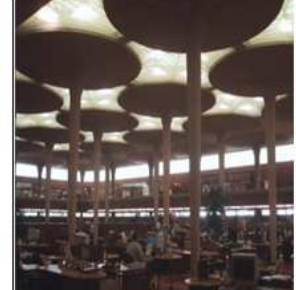



Analogy technique is based on making a comparison between two objects. It is to produce new forms based on a known and recognized fact or form. Thus, analogy is defined as the explanation of an unknown and strange fact with known and similar facts.

In his book “On Growth and Form”, D’Arcy Thompson (1945) has stated that the lives and forms of all living plants and animals have physical and mathematical bases. Accordingly, all the behavior and the movements in the world actualize in the most economic way decided by physics law. This fact has been emphasized with the statement “ form is a diagram of forces.” in D’Arcy Thompson’s book.

Nature has always been a source of inspiration in architecture and architectural theory. The most common paradigm in the literature when it comes to architecture and learning from nature is the transfer of forms and structures in nature to construction. In the heritage of architecture, there are many examples of inspiration from nature, namely analogy. It can be seen that various metaphors have been utilized in a wide range such as branched construction like trees, flower analogies, web structures, shells, crystals and stars (Table 2).

Characteristic features:

- Design approach gets inspiration from nature. Building or design process is handled in the way nature cycle occurs. Emergence of the construction is like the seeds growing up to become plants in nature. Construction develops with its environment in area.
- In nature, growth and development starts from seeds and reaches its surrounding. Therefore, building reminds of organism and reflects the beauty and complexity of nature.
- Apart from cities, buildings one by one have their share of the passion of human beings for comparison and especially comparison to animals. The similarities made between animals and buildings might not always be clear and explicit.

Table 2. Samples of analogical approach		
		
		
L'Hemisferic Santiago Calatrava (4)	TWA Station Eero Saarinen (5)	Johnson Wax Binas Frank Lloyd Wright (6)
The lines occur depending on a form. The study directly corresponds with the object or living thing imitated.		

### c) Metamorphic Approach and Process

The dictionary meaning of metamorphosis is transfiguration. In metamorphic approach, geometric forms and lines are universal. Geometric form or line does not belong to only one model. The approach is to look at the place, its entirety and the fiction of moving, defining, and interpreting the living concept of space and the pieces in the whole.

Consequently, when presented to student as a design model, metamorphic approach means basically “a strategy of image development used for transferring from a line or form into another meaning or form”.

Whereas design setup is based on nature in analogical approach, it does not belong to any model in metamorphic approach. Outside contours of any object can be taken and put in a very different formation. Therefore, even one line may be a starting point of the design (Table 4).

For example, although outside contours or order of the magazines standing on top of each other do not refer to any kind of known form, nature or an object, the lines abstracted from form by the designer can be shaped with a new interpretation. As a consequence, the obtained design presents unique data and as long as the starting point is not identified, the metamorphic source is unknown (Table 3).

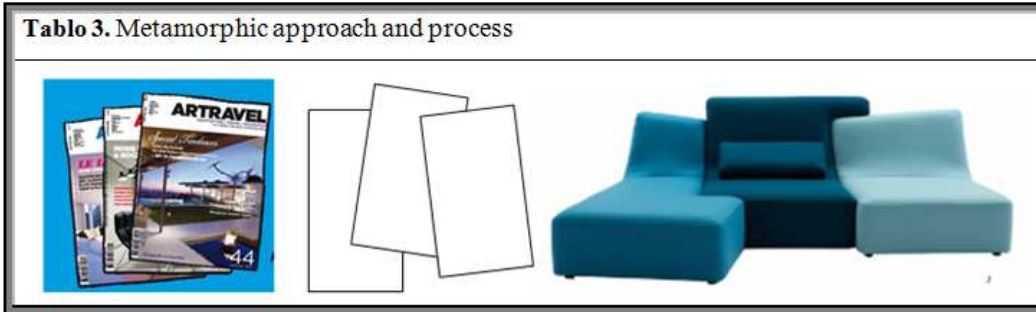
Characteristic features:

- To use a form/line/data for another purpose,
- To play in discovery way,
- To try to create a cycle going through Abstraction- Interpretation- Creation phases.

### Student Studies

In the study, firstly, the graphical hypotheses have been put forward as a result of analysis studies which will lead to design. On these hypotheses, a discovery game is being played with Deformation-Analogical- Metamorphic approaches (Table 5-6-7).

The graphic hypotheses obtained with the abstraction is started the process of creation and interpretation in accordance with the analyses done before. This process is a cycle where ideas are discussed and a stage in which students starts to use their initiative.



<b>Table 4. Samples of metamorphic approach</b>		
<p>Wei-Wu-Ying Center for the Performing Arts Taiwan Mecanoo Architecten (7)</p>		
<p>In Wei-Wu-Ying Center, the lines consisting of the gaps of tree textures has transformed from its original shape into the general form of the construction by metamorphosis.</p>		
<p>WA Designer Elizabeth Delfs Textile Art in Berlin (8)</p>	<p>Hotel Marques de Riscal Winery Frank Gehry (9)</p>	
<p>Which study is inspired of the other one? Is it a coincidence? Both sides might have been inspired of each other. Who can claim that these lines are Gehry’s or Delfs’?</p>		
<p>Metamorphic process is to use a form/line/data again for another purpose. The purpose is to make students play in discovery way.</p>		





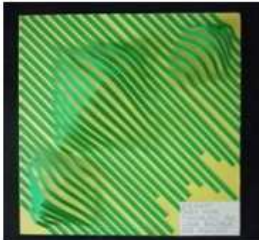




Table 5. Samples of student studies with deformation approach		
		
Deformation of the form with reduction		

Table 6. Samples of student studies with analogical approach		
		
Semi-open venue design	Venue generation with a different view of the contour lines	Semi-open venue design from raindrop analogy
		
Spider web analogy	Contour line analogy	Raindrop analogy




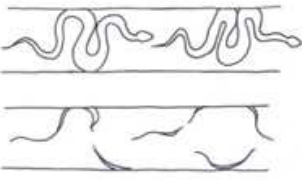
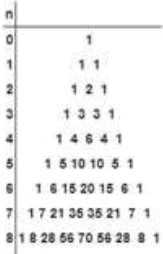

## Results

As the results of the studies students have done as part of the project lesson in which Deformation-Analogical- Metamorphic approaches have been used: it has been tried to show and exemplify that:

- Design process can be shaped by reduction, articulation, explosion, splitting, emptying, straining and shrinkage process
- Design approach can be inspired by the nature
- The lines can be applied in design setup by being broke, moved, destroyed or extended.

Consequently, the following have been tried to teach to students;

- Students can evaluate the data they gathered in stylistic and fictional order,
- they can improve the capacity of using their imagination,
- they can improve the ability of interpreting the data they reached during the design process with different approaches
- Each line used at the beginnings can get into different shapes and they can have different meanings.

Table 7. Samples of student studies with metamorphic approaches		
		
Semi-open venue setup supplied with fluid walls	Holder system setup for open-air museum	Semi-open venue setup
		
Litheness of snakes	Consecutive numbers	Thinking blocks

In conclusion, the usage of Deformation- Analogical- Metamorphic approaches in architectural studios suggests an alternative approach to improve their awareness and thus their perspectives in creation process.

Using method for design will be helpful. However, one method is not enough for solving problems. With regard to the architect’s focusing on the subject and thinking about it, it will make things easier, reinforce the concentration and support the discovery process of the candidate.

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