An Experience on Analogy and Metaphor: Creative Design Tools To Increase Students' Creativities

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Abstract

There is a consensus that form borrowing and visual metaphor inspire architects. Traditional architecture like other design domain grow on the absence of non-visual features and architects tend to think, know and work in visual way. The aim of this paper is to indicate the capability of a design approach based on the usage of analogy and metaphors to increase architecture students creativities on the first year. What is unique on this experience is the usage of abstract concepts instead of images. During four weeks, students experienced to find a design solution to the following question: "Do abstract concepts and geometrical shapes (euclidian and non-euclidian) and colors may influence architect? Instead of visual images as reference forms they tried to use verbal stimuli. Then, by using these verbal stimuli, they created three dimentional model. This studio-based experience showed us that analogy and metaphor are powerful tools to increase students' creativity even visual stimuli were not used. Additionally, the tendancy to use haptic solutions are distinguished among the students who have already performed sensory perception.

Keywords: Analogy, metaphor, abstract concepts, architecture, verbal stimuli.

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1. Introduction

There is a consensus that metaphors and analogies are useful tools to increase creativity in design. Metaphors are more common than analogies in early stages in design to better understand the problem whereas analogies are used on later stages for concept generalization (Hey et al., 2008; Casakin, 2006). But, there are also studies which emphasized the powerful contribution of analogies to problem solving in design context as well. For example, Casakin and Goldschmidt (1999) reveal that, both students and experts in architecture use visual analogies to improve design problem solving. Casakin (2006,) in his study on architecture students, showed that students employ metaphors as a design tool when they frame and define the situation. Apart from this, we may conclude that both analogy and metaphor are very creative and innovative tools in design world even we do not known much on their relationship during the design process.

In different education based on design practice students observe analogy and metaphor to generate new ideas. These tools facilitate also design-professionals in problem solving and help them to develop concepts. Researchers found positive correlation between using analogy and metaphor and increase of designers' imaginations. There are many studies exploring the role of analogy and metaphors in imagination and creativity of architecture (Do & Gross, 1995; Casakin, 2006, Casakin & Goldschmidt, 1999, Cubukcu & Dundar, 2007), landscape architecture (Alon-Mozes, 2006), and engineering (Hey et al., 2008).

Architecture as an art and science of designing and creating buildings, begins with a dream. When an architect inspires from some things, imagines life in and around of his/her design, we may ensure that the initial stage of design has overcomed. The imagination and inspiration phases are commonly supported by visual images and stimuli which are more preferable than verbal ones such as text, stories etc. This is the easier way for architects than any others. Therefore, architects should mind all stimuli's (visual, verbal, haptic, audial) contribution to environmental perception which may take first initial steps in design.

This paper aims to show a studio-based experience on architecture students who may achieved to use abstract concepts on the inspiration stage of their first year basic design projects. They do not transform their conceptions into three dimensional building projects, but, they create liaisons between abstract concepts and modelling. This bridge of using analogy and metaphor helps students to overcome the difficulties of inspiration at the beginning of design process.

2. Analogy and Metaphor

Analogy and metaphor are type of comparison firstly used in linguistics. There are two types of metaphors, one is verbal metaphor, the other is visual metaphor. The visual metaphor consisted of primary means of communication of early civilization. Today, metaphors not only concerned by language but also in daily life in the form of song, conversation, media and advertisement. It is a system of thinking and helps to create new ideas. "The essence of a metaphor is understanding and experiencing one thing in terms of another" (Lakeoff & Johnson, 1980). Metaphors are also useful to understand of an unknown situation in the forms of a known situation. Metaphors are powerful tools in problem solving and well known in as a disciplined system of thinking (Fez-Barringten, 2012). Since Aristotle, the role of metaphor in creativity has been recognised and continues to increase in science and architecture (Ayıran, 2012). Aristotle in his book The Art of Rhetoric explained metaphor as a sign of genius, and emphasized that "most smart sayings are derived from metaphor" (quoted in Travaglini, 2015, p. 62). Due to the abstracting power, analogies may increase the creation of new concepts (Casakin & Timmeren, 2015).

Analogy can also be considered as a useful tool in inspiration and imagination. It is a type of comparison and helps to increase creativity. "Analogy establishes a similarity, or the existence of some similar principles, between two events which are otherwise completely different. In employing the method of the analogy it should be possible to develop new concepts and to discover new relationships" (Sorrentino, 2017, p.58-59). It was primarily used in linguistic but now, it becomes an effective tool in design world to increase creativity of designer. According to Merriam dictionary, analogy implies likeness or parallelism in relations rather than in appearance or qualities. So, it is based on similarity in some respect between two elements that are otherwise dissimilar.

Visual analogies are common in design world but, there are also studies showing verbal analogies. Goldschmidt and Sever (2011) work on verbal analogies and observed how verbal stimuli affect industrial design students. They remarked that reading text even unrelated to the object to be designed could improve design problem solving. Similarly, Alon-Mozes (2006) expressed verbal stimulus as creative inspirations in the early stage of design among landscape architecture students.

Why are visual analogies commonly used in design? The answer is connected with the nature of design and design discipline itself. Almost all designers used to dream, think and perceive visually. The use of multi-sensoriality in design process is usually questionable but less preferable. "…this visual predilection is inherent to our human brain and nourished by our western cultural framework" (Herssen, Heylighen, 2007, p.1).

Therefore, visual stimuli are particularly involved to design process. Especially in the early stage of this process visual analogies and metaphors transfer from visual stimuli to sketches or models (Casakin & Timmeren, 2015). External stimuli influence designers, and they may contain some key elements and cues which will be transformed later to the design product. When a designer must remember a suitable image which has already been coded to his/her mind to solve the problem, analogy and metaphor may help him/her to find his/her way, Apart from this, Hey et al. (2008) express analogy and metaphor as a mapping of knowledge which create new inferences and provide new insightful way in problem solving.

3. Analogy and Metaphor in Architecture

Architect targets to reveal a unique product which has never seen. The creation of this product is always a painful process but there is no formula to solve the problem. However, there are different ways to crystalise an idea at the beginning of architectural process. One of this way is creativity through imagination and inspiration.

Architecture is a creative disipline and many architects spend time to generate a creative idea. According to scientists, creativity can be achieved through, "1.Combining ideas from different domains, 2. The use of visual imagination, metaphor and analogy and 3. Expanding and varying the search space of alternatives" (Do & Gross, 1995). Visual imagination in shaping forms and spaces by using metaphor or analogy is very common in architecture. It is not a coincidence to reveal these tools in both ancient times and modern architecture. Vitrivius and Le Corbusier prefer natural forms and organism, which are shown as the best examples of visual metaphors (Ayiran, 2012). Or an analogy can be discernable at F. Law Olmstead's park design in Boston Massachusetts as an "emerald necklace" (Do & Gross, 1995).

Generally, architects develop their ideas by using sketches and therefore inspired from visual images. This is a part of creativity which all students try to learn. Currently creativity is integrated into our daily life so it is not just a talent full matter. Everybody may improve on creativity with cleverness about thinking way. There is no need to wait for an "A-ha moment". Therefore, instructors encourage architecture students to use analogy and metaphor which lie on the heart of creative minds. Usually visual metaphors or analogies are preferred instead of verbal ones (Do & Gross, 1995; Suwa & Tuersky, 1996).

4. Survey-Studio Based Experience

The aim of this paper is to explore verbal stimuli usage in basic design studio of architecture education. What is unique on this experience is the application of abstract concepts instead of images. 23 architecture students from the first year of the architecture program are subjects of this qualitative research. During the last four weeks of the spring term of 2013-14 academic year, students were asked to define their most prominent feelings in Istanbul, the metropolitan city where they live, and express these feelings by using 3 dimensional models. As a first step, students tried to fill the sentence "In Istanbul, I feel/I'm/I've…". Each student defined himself/herself with words and discussed with the instructor. Then, it is asked to define the same feeling with the help of three dimensional modelling. A condition for the students was to use an Euclidian and/or post-Euclidian geometrical elements, within a cube frame 50x50x50 cm. by using at least two basic design principles (harmony, contrast, unity, variety, balance, repetition, dominance, emphasis, proportion).

In the following stage, it is asked to represent personal emotion by architectural items in three dimensional mock-up model. As a result of this stage, each student selected a metaphor or create an analogy to express his/herself. It was a good timing that during this stage The Exhibition Dialogue in the Dark is opened in Istanbul and sightseeing recommended by the instructor. It is believed that it would be a good experience for students who searched accessibility problems in Istanbul and prepared mood-boards taking attention to these problems. At this moment haptic perception did not explained in the studio. Six volunteer students visited the Exhibition Dialogue in the Dark in Istanbul. As a short explanation, Dialogue in the Dark tries to create empathy for social awareness about the blind people's world. It develops emotional intelligence and orients individuals to a world without pictures.

5. Results

The first year architecture students examined how the verbal message/their feelings on daily life in Istanbul- could be expressed in three dimensional mock-up model in basic design studio. Each students defined his/her feelings in architectural terms by using metaphor or analogy. Table 1 shows students' solutions

In this studio experience, novice students used verbal references to inform their designs. Frequently architects' references are visual but in this case, we urge to use verbal ones. Therefore there were no shapes or physical forms that students extracted and employed in their designs. Instead of physical forms they had functional, behavioral and emotional inspirations. Though there was no formal teaching or spending time to understand metaphor and analogy usage in architecture, students were free to convey their feeling into three dimensional models.

It is also observed that students who participated to Dialogue in the Dark wanted to express themselves through the haptic solutions. In their designs, colors are less important than figures. This was their choices but encouraged by the instructor and were very excited when they explained their experiences during the process.

6. Concluding Remarks

This quantitative study shed light on the powerful effect of metaphor and analogy as teaching tools in architecture education. This studio experience made with novice students for both to introduce them these tools in architectural thinking and increase their creativities. In the conventional approach visual images are commonly used as design generator even in metaphorical thinking, but, this study started with emotional and verbal writings as an initial step in basic design projects.

One of the core competence among the novice students in architecture is to discover design thinking and the initial ways of inspirations. Simply the ability to develop skills is extremely important for students who come from different cultural and educational backgrounds. This finding is similar with Casakin (2006) research in which he explained metaphor as helpful and difficult to use in the early stage of architecture education.
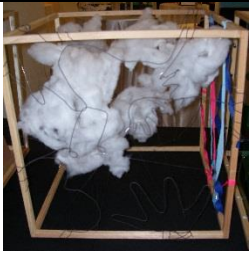
The second outcome is students' skills and interests on haptic perception. They easily adapted to sensory perception and used it in their three dimensional proposals. We believe that the Dialogue in the Dark Exhibition had positive effects. The students who learnt the behaviours and experiences of blind people on environmental perception, tended to convey them into their architectural design projects (Herssens & Heylighen, 2007). Therefore, experiencing for an architect is a big contribution to professional practise. These volunteer students were happy during the semester's final exhibition since many blind visitors congratulated them for their haptic designs and expressed how easily got the feelings of students. For further studies, it is suggested to investigate sensory perception and its reflection to design solutions for both novice and graduation level's students. There is a need to check for further studies if haptic perception can be taught and included to students' design abilities. In this sense, performing this perception as it occurred in Dialogue in the Dark, may be a good and fruitful tool.

In this studio, we sometimes assumed "metaphors can be perceived as a kind of analogy, because the basic process of analogical reasoning, such as structural alignment between source and target, progressive abstraction, and representation, are used in the processing of metaphor" (Casakin, 2006, p.255). In sum, students encouraged to think analogically and use metaphor during the studio's experience.

This studio based experience is also valuable for students who should gain architectural jargon as earlier as possible. By using metaphor or analogy, students textural and communicative skills enrich and deepen. It is also a way of interpretation of all stimuli and being a part of architectural criticism as mentioned by Caballero (2014). In the early stage of design education, metaphor and analogy provide students to familiarise with architectural technical language

This studio experience showed us that students may perform on haptic solutions if they made any practise. This is also valuable to generate universal design approach in the future projects. Therefore, even in basic design course, instructors can encourage student to use sense of touch as a design tool.

Table 1: Selected Projects of The Studio

Students proposals and inspirations		Students proposals and inspirations	
 I'm an artist (Dilara)	She thinks of her model as an art masterpiece of life and applies the analogy to drive the shaping of physical form: liveliness are amorph white cotton pieces and living beings are other black amorph elements.	 I'm in a hurry (Gizem)*	She applies analogy to drive the shaping of physical forms: caos are curviliniar elements and may found every where and every time and her body stands alone among them (the red amorph objeect)
 I've hopes (Alper)	He establishes analogy between world and dark-covered cube. He defines hopes as yellow prisms.	 I'm prisoner (Hande)*	The metaphor being a prisoner is expressed by matching common object attributes (chain and clamps). It can also be processed as an analogy as mentioned by Casakin (2006)
 I've fun (Tugce)	She establishes analogy between fun and her colorful model	 I've an active life (İlay)	She applies analogy to drive the shaping of physical forms: Different balls represent active life. She also uses vivid colors to intensify her idea.
 I choke (Ceren)*	The metaphor is used to express the sense of choke and uses a small cube framee which hangs on in the space but pulls at both ends.	 I'm on tenterhooks (Serife)*	The metaphor is used to express her anxiety and is expressed by stalactites and stalagmites.
 I've a dream (Aygül)	She defines her goals as dreams which can be reached and uses different informal objects hanging on in the space. She uses metaphor.	 I live despite everything (Emine)*	She establishes analogy between flatness and thorny cube which stands on in the space.

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	He applies analogy between the orderly life and well defined prisms.
I've an ordered life (Halil)	

-one of the six volunteer students who experienced Dialogue in the Dark.

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