

# The role of sketches in terms of creativity in design education and the effects of a scientific ideal

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## **Abstract:**

Architectural design studios are highly sophisticated means of creative problem solving. As design problems are ill-structured, they cannot be solved by using a certain algorithm. The methods and means of solving such problems are not quite clear. Designing experiences demonstrates to us that sketches are a very important means of creative design solutions since they magnify mental capacity. Therefore, they have the ability to play a significant role in the architectural design studio. However, the inclination that gives sketches a secondary role by attaching primary value to theory has been affecting design education. The reason for this situation is the dominance of a scientific ideal which regards that verbal and computational expression with theory is superior to praxis and visual expression. This problem estranges design education from its own essential necessities. Within the framework of this problem, this scrutiny has two interrelated aims. The first one is to explicate the role of sketches in terms of creativity in design. And the second one is to discuss the limits of the theory which is highly prized in the universities in respect to architectural design education. These topics will be discussed based on the scrutinizing of the literature and inferences from this study.

**Keywords:** *creativity, sketching, architectural design education, scientific ideal, visual thinking*

## **Introduction and problem**

Design is a very complicated problem solving activity different from the traditional way of problem solving in cognitive psychology. Therefore, it requires creativity (Elias, 2005). According to Goel (1995), sketches are mediums which facilitate creative transformations of design. The role of sketches in the design process is described as the "primary nucleus" by Arnheim (1993: 16). From these points of view, it is evident that sketches have a very significant function in architectural design studios since they are a highly sophisticated means of teaching creative problem solving (Ledewitz, 1985). However, as sketching is perceived as a non-rational way of learning (Goldschmidt, 1994) and artistic activity, it is deprived of efficient encouragement and consideration in modern research universities. Cunningham (2005) explains this situation and the student's position to it as follows: "The education around learning-by-doing, evolved to support the formation of aspirants for a profession centered upon creativity, is not fully

appreciated by the academic community...whose educational preferences continue to be shaped by the linear predictive models upon which universities have historically based their expectations” (p. 415).

According to Buchanan (2001), while the theory is highly prized in universities, the importance of production and making is ignored as a subject of learning. This situation estranges architectural education institutions within the university structure from visual thinking which is necessary for this unique edification and thus, deteriorates the balance between theory and praxis. It has been recognized that this situation is similar in other fields of design: “The hegemony of science and mathematics within traditional engineering has left design with a low profile” (Winkelman, 2001: 231). Although visual thinking and sketches in this context are required in scientific studies as well, this situation remains under shadow. Ferguson (1977) explains the reason of this as follows: ““Much of the creative thought of the designers of our technological world is nonverbal, not easily reducible to words; its language is an object or picture a visual image in the mind...This intellectual component of technology, which is nonliterary and nonscientific, has been generally unnoticed because its origin lies in art not in science...” (p. 835).

In architectural education, generally accepted as design education, much value is attached to theory and verbal thinking because of the domination of the scientific ideal. As Fish and Scrivener (1990) point out, “...the denotation system used in paper-and pencil sketching assist creativity in ways that are poorly understood” (p. 117). It has been observed that students are reluctant to use sketches and tend to explain their projects verbally instead of through sketches and other visual mediums in design studios. It is an expected result of a contradiction existing in our current education system. We educate students emphasizing the importance of verbal and computational expression in all domains of education and then we expect the student to adopt an artistic and creative design process (Doll, 2002).

The wide range of differences of understanding and approach about design among designers also exists among architectural schools. In this respect, it is not possible to claim that such a problem is likely to be found in every educational institution. However, many scrutinize some of which are cited here, directly or indirectly, point out the fact that such a problem is very commonly encountered. This article anticipated these two purposes and connected them to each other. The first purpose is to point out the importance of visual reasoning in respect to creativity in design and consequently in design studios and emphasizes the role of sketches. The second purpose is to discuss the validity of verbal and computational expression styles which prevent an effective role of sketches in architectural design education. This discussion will apply a critical method based on direct sources about design and studio teaching; research made on creativity and the philosophy of science, the inferences from the research and establish new links between different sources.

### **Sketches in the context of verbal and visual thinking**

“Designing and making is like having a quiet sort of game, and that game is played through drawing” stated by Renzo Piano (quoted in Robbins, 1994: 127), and Brawne (2003) points out that, “Architectural thought is primarily non-verbal thought” (p. 7). If there is consensus about these points, it should

also be accepted that verbal thinking and expression are insufficient although definitely required to some extent for architectural design activity. According to Dewey (1980), "Thinking directly in terms of colors, tones, images, is a different operation technically from thinking in words...can not be translated into words" (p. 38). Koestler (1964) seems to have more sharp views on this subject: "Language can be a screen that stands between the thinker and reality. That is the reason why true creativity starts where language ends" (p. 177). These views indicate that it might be improper for architectural design education to put more emphasis on verbal expression than on visual expression. However, in this respect current design education does not seem to have a proper attitude. According Fish and Scrivener (1990), the reason for this situation can be explained that "Western culture and education are still dominated by verbal / propositional reasoning and information storage" (p. 125). Such domination in an activity like architectural design which is quite complicated, multi-faceted and includes nuances, reduces it to an arid conceptual world and thus cannot reflect its complexity. The scientific way of thinking based on verbal and computational expression styles excludes visual thinking to be a required intellectual capacity for design. Besides, as Kogod (2000) indicates "...the relations between words and form are still unresolved in architectural theory" (p. 35). But it is not possible for science to isolate itself from visual reasoning nor is it beneficial. It necessitates a visual representation as is the case in atomic physics or quantum mechanics when they are dealing with "deep structures". This required visual imagery benefits from the works of artists like Giotto, Constable, Cezanne and Picasso (Miller, 1995). While scientists tend to find existing or assumed to be existing situations, existences and structures, artists and designers aim at creating a non-existing entity. As Cunningham (2005) points out, "...architects view and interpret the world in a particular way, their education which is value – rather than fact oriented..." (p. 434). The designer turns to her/his world of images when s/he is trying to find something new and realizes that sketches are the significant instruments s/he can use. Each design of a designer is a unique interpretation of her/his unique conceptual system. From this respect, scientists work in a reverse direction to artists and designers. Reversing directions of their activities does not prevent them from being beneficial for each other. In current academic circles, design instruction gradually alienates itself from sketches and other visual expression styles and heads towards verbal expression styles. This situation however implies "good intentions" to eliminate reverse positions of scientists and designers as well. But, such a situation cannot be called a misfortune because it is an essential issue of difference between the character of science and art or design. Visual reasoning does not limit scientific thinking or it at least prevails in some people or situations. One example of this situation is the work of Einstein: "Writing about his creative thinking Einstein said that visual imagery occurred first, and word followed" (Miller, 1989: 143). Einstein, generally regarded as the most important scientist of the previous century, was educated and worked in an environment where people attach value to visual thinking. We do not know to what extent this situation affected his creative thinking but we definitely know that his reasoning on the special theory of relativity is related to visual images (Miller, 1990).

Goldschmidt (1992) draws our attention to the role of visual thinking and self-generated sketches in this context: "A design problem is solved when a satisfactory visual representation of a drawing concept is produced. To deal pictorial properties of the design concept, the designer utilizes visual

thinking, which is represented through sketching. In serial sketching the designer systematically transforms images of the entity that is being designed: each sketch provides feedbacks that informs the generation of subsequent representations” (p. 191). Beyond the function of sketches as a visual stimulant, it is proved that rich and arbitrary visual stimulants imported from external milieu into the working environment increases creativity during the design process (Goldschmidt and Smolkov, 2004). Malaga (2000) demonstrates that visual stimuli are much more important than verbal stimuli in idea generation. Interestingly, visual stimuli without inscription are more effectual than the ones with inscription. Assuming that reading texts have a positive influence on creativity seems to be a cautious attitude but we have no evidence yet (Goldschmidt, 2006). It is obvious that verbal stimuli will not have a direct role on design processes without being transformed into visual images.

### **The role of the sketches in respect to the relationship between theory and praxis**

The relationship between theory and praxis as a highly complicated issue has occupied the mind of humankind since the beginning of philosophy. The emergence of thoughts about this relationship in architecture is quite old. Nearly two millenniums ago, Vitruvius (1960) pointed out that theory and praxis should be in balance and have a mutual relationship in architecture. Although there is no serious disagreement among contemporary design instructors about the necessity of a balance between theory and praxis, the balance could not be achieved as theory is favored. The reason for this situation is that instructors cannot manage to struggle with the strong scientific ideal. Albrecht (2002) draws our attention to the fact that, “...recent architectural debate has centered upon theory rather than building” (p. 194). Similarly, the extensive usage of the term “reading” in current architectural discourse is an indication of the increasing importance of the verbal expression and theory in this field. Although reading contributes much to the intellectual development of human beings, it is a passive activity. However, design is a kind of activity which is essentially and necessarily transformative and active. Thus, it is much closer to writing than reading. Both in the context of its literal meaning and the meaning attained by examining or interpreting extant entities or situation that only “reading” is not enough to reach effective and creative design solutions is not underlined and thus, visual thinking and sketches are not given necessary importance. In normal science, theory and praxis are separate and sequential. Generally, theory and knowledge leads to praxis (Snodgrass and Coyne 2006). This indicates the important function of theory in scientific activities. Since the design is not an epistemological event which is a hermeneutic and interpretative activity based on doing, in such activities, the relationship between theory and praxis is totally different from science; theory and praxis are not separate but interwoven (Snodgrass and Coyne, 2006). From this perspective, Cunningham (2005) claims that, “Architecture is a distinct epistemological category, a practical art occupying its own cultural territory” (p. 343). An interwoven structure of theory and praxis becomes more tangible in sketching processes. No matter which theoretical idea the designer begins with, s/he continues her/his search in design’s free territory by using the associations formed in her/his imagery and the foreseen theoretical idea begins to lose its control at this point. Buchanan (1998) explains the reason for this: “By focusing on concrete problems and practical situations – on what designer’s call ‘the project’ – design shifts attention away from ideology and theory ...towards action and production” (p. 18). A man-made

environment can also be defined as “secondary nature”. Sketching is a phase of the design process in which the designer feels her/himself as the creator of this secondary nature at most. During this process, the designer feels powerful enough to change not only the problem but also every law in this field or make new laws in order to reach the desired result. Architectural education if it is modeled on a scientific ideal, means this freedom of the designer will be limited and s/he will be expelled into a different cultural territory where s/he will no longer be allowed to play the role of God of secondary nature.

Although the issue of theory is always in the foreground, systematic knowledge and theory peculiar to architectural design is a highly debatable issue because theories and methods that are used in design are imported from other disciplines (Cunningham, 2005). Design knowledge acquired from various fields is not very clear and is difficult to define, understand or classify (Uluoğlu, 1990). The main issue in architectural design is how to increase effectiveness and efficiency of this activity and consequently how to create better environments. It seems that it is quite urgent for architectural design to discuss the role of theory in architecture in this respect by shunning strong influence of a scientific ideal in order to maintain its essential requirements. Such a discussion does not aim to decrease the value of theory; it just aims to understand the objective results within an accountable function of theory in design and to regulate the process of design studios in accordance with these results. Ideas suggested so far probably do not mean that other courses and theoretical knowledge that is handled in studio works are not valuable and necessary. At least, to create the visual memory required for sketching, there should be other courses besides studios. In addition to creating visual memory, it is obvious that both the studio instructor and the student will need theoretical knowledge and scientific data in order to evaluate sketches and other visual expressions related to design on a common ground. However, the function of theory is limited to new understandings, criticism, interpretation, persuasion and communication within the respect of design studios (Teymur, 1992). The discussion here is related to the fact that theory is given an importance beyond its functional limits and seen as an authorizing argument of truth and ignorance of the interwoven relation between theory and praxis in design and the situation that they continuously generate each other. Here the point that architectural design education requires theoretical knowledge but is not efficient by itself; praxis is also needed and is even more important than emphasized. Younés (2002) appears quite skeptical about the primary role of theory in creative architecture as he states, “... there is no casual relation between written architectural theory and creative production and good architecture. Nor is the proliferation of architectural theories a guarantee of architectural quality” (p. 252). Kogod (2000) claims that if theory is considered to have a determining role of design, it suggests that there is a unilateral relationship in which word determines the form. This suggestion brings forth a highly debatable issue which sees design innovations as synonymous with theoretical formulations. In the 18<sup>th</sup> century, Vico (1968) had claimed that “imaginative universals” should be used instead of aridity of rationality of abstract thinking for the creativity of mind. In this regard, Goldschmidt (2006) considers sketches as “imaginative universals” that triggers creativity: “...sketching is top-priority means of devising visual representations, which in turn are the most effective medium for evocation of mental models of tangible object” (p. 49). Frascari (1988) posits that architectural theory has no power to activate creative imagination and is based on research made about intelligible

universals and rational categorization. It is not very likely for arguments about the limits of theory in design to transcend the scientific ideal since theory is highly mystified today. The quite significant position of theory in today's academic culture also seems to be related to conjectural conditions. According to Petrov (1998), a human brain's right and left hemispheres shift their capacity every 50 years and one becomes the master. During the period we are in, the left hemisphere related to verbal elements, rationality, theoretical concepts is in the foreground. These conditions compel sketches to have a low profile in architectural education.

Generally, in architectural design education, the balance between theory and praxis is established in curriculums by a linear and systematic teaching system in courses and creative projects in design studios. The learning process in design studios is quite different from other courses. It does not mean absorbing cool information passively; instead, it means participating actively. Praxis seems more critical compare to theory from Petty's (1983) perspective, as he declares, "Design is doing, and one gets better at design by designing, not by attending lectures on The Theory of Design" (p. 33). According to Petty (1983), courses outside design studios are based on systematic methods and are strictly structured; these courses generally do not have the potential to develop creative ability; they even have a negative effect on the creativity of students. The reason for this point of view could probably be recognizable from Benami's (2002) explanation: "Creativity is an unstructured process, so systematic methods do not necessarily help to generate creative ideas" (p. 29). The remedy for this deficiency of other courses is to improve creativity with the contribution of design projects (Petty, 1983). Architectural design studios in a sense are similar to "body building", you develop the "muscles of the mind" by creative self discovery exercises of learning by doing. In such an adventurous atmosphere, normally dominant linear educational methods seem alien (Cunningham, 2005). The function of sketches, a means of learning by creative self discovery which improves the "mind's muscles" appears to be quite valuable in the design studios since as posited by Johnson (2002), "Sketching as a part of design thinking is at the very heart of creation..." (p. 250).

### **The relationship between sketching and creativity**

Stravinsky once mentioned that at the moment when he took a white sheet to start his new musical composition, he really got frightened. At that moment, one has all the options to create a new composition; theoretically it is possible to go any way s/he wants just like a boat on a wide ocean. As in all other creative activities, the designer also is confronted with a similar situation at the beginning of the design (Alty, 1995). As s/he has all the options, that moment is really critical. S/he does not necessarily get sort of frightened. However, s/he inevitably feels the deep psychological impact of that critical moment as a creator of secondary nature. Like a composer who starts a work by converting vocalic images in her/his memory into notes, a designer converts visual images in her/his memory into sketches. In other words s/he externalizes these images using a way similar to that of a composer and tries to find her/his course. In a way, sketching seems to be an instrument that will lead a designer to her/his target.

As Arnheim (1993) remarks, "Creative designing always involves the solution to a problem, the carrying out of task, and, therefore, the image unfolding in the mind always refer to a goal image" (p. 15). However, the "goal image" in a designer's mind is not perfectly clear. In the context of our

boat and ocean metaphor, probably the only thing that is quite clear about that goal is to reach a land that is unknown and hopefully not drawn on a map yet. Sketching in a sense can be seen as an activity of continuous change in the course of reaching a designer's ultimate goal according to meteorological conditions and intensity of current. For this end, the designer intentionally abstains from using existing navigations maps previously prepared. Coyne and Snodgrass (1991) briefly explain this situation as follows: "Design ideas are personal and unavailable from general scrutiny" (p. 131). While s/he pursues the path chosen, if something better crossed her/his path course, the designer can easily change direction. Consequently, the goal and the instrument are always in interaction with each other.

Unlike science or mathematics, there is no question to be answered or specific problem to be solved in the processes of architectural design. Alfert (1986) remarks, "What is often called problem solving in art refers mainly to the development of skills to achieve a certain desired effect. Unlike in science, the problem is not inherent in the project but originates with the artist" (p. 328). Meuer (2001) explains his idea about design which seems similar to Alfert's as follows, "Design should be effective, but in its effectiveness it must also see itself as a self-created problem...Design must be liberated from the one dimensional mode of thought that focuses on solving task" (p. 53). The designing processes of architectural products which widen the limits of our thought and imagination world are, in a way, activities of solving self created problems for architects. Paul Rudolph describes this situation as, "The artist ignores certain problems, addressing himself to a selected few. He proceeds to solve these so eloquently that everyone understands the statement and its truly glorious solution...It is axiomatic that certain problems be ignored if a great work of art is to be created, and in the hands of the artist this is justifiable, indeed necessary" (Rudolph, 1963, quoted in Garvin, 1964: 3). Here, Rudolph also reveals the secret of architectural creativity and success of an architect. This secret is making a decision about a problem which seems to be important for our world of images, and we believe that we have the ability to solve it. Such an attitude is inevitable because all problems in architectural design cannot be solved concurrently and with the same efficiency. Sketches also help us to understand our world of images by transforming them into concrete expressions. Therefore, they assist us both in determining a problem and solving the problem we have determined.

According to Drabkin (1996), "Creativity is the ability of human intelligence to produce original ideas and solutions using imagination" (p. 78). Within the framework of this definition, creativity in design implies the production of an original form by using imagination. The most recent empirical works about creativity suggest that the creative process "...consists of cyclical loops of feeling, responding, evaluating, selecting and communicating" (Tate, 2007: 71). In such a process, sketches have great importance, because during sketching, our feelings form some images in our minds and we give response to certain design situations by using them. This externalized response is now a concrete visual image. After evaluating it in intellectual processes, we select which way to progress. With the help of sketches we can communicate with people related to that design subject. However, our communication process, which we created through our sketches on our own, is the main issue considering the creative design process. This self communication is defined by Goldschmidt (1991) as "dialectics of sketching" (p. 123) and by Smith (2005) as "personal dialogue" (p. 2). However, the

main point of creative design is the process of self communication achieved through the sketch. This dialogue has the potential of making us reach a new feeling and consequently a new design situation. Unwin (2007) in this context remarks that, "For Le Corbusier, sketching was a personal way gradually understanding more and more what he could do with architecture" (p. 105). Traditionally, tracing papers are put one above the other and continuous sketching gives a designer cyclical loop as feeling, responding, evaluating, selecting and communicating in the creative process. In the beginning, sketches are generally tentative, generic and vague. This vagueness is not a negative quality; on the contrary, it is a positive one. As Goel (1995) points out, "Ambiguity is important because one does not want to crystallize ideas too early and freeze design development" (p. 193). This vagueness helps us realize new opportunities (Arnheim, 1993). The fact that our perceptions are not absolute; they have a hybrid quality as they come into being when images directly coming from the retina and long term visual memory overlap (Fish and Scrivener, 1990). The ambiguity of sketches changes continuously this superimposed hybrid image and thus keeps imagination always vivid with the effect of a multiplier. As Godwin, Makirinne-Crofts and Saadat (1997) remark in this respect, "...retinal image with superimposed information from long-term visual memory recall via a gating mechanism; this explains how the incomplete or impoverished stimuli found in rough sketches stimulate a stronger imagined component" (p. 323). Naturally, unique experiences of each individual constitute a personal long-term memory. This difference makes every person perceive a sketch in a unique way and consequently makes her/him realize different potential of others. In the same way, a designer will alter her/his mind constantly while her/his alternating sketches. So s/he can realize a new opportunity in her/his next sketch which s/he could not realize in the previous one and her/his vision will not be convergent; in contrast, it will be divergent. A précised drawing is closely perceived by almost everyone. Even if a specific person's experiences change, there will not be a significant perception change. From this point of view, hard line drawings create a convergent situation. Considering this characteristic of sketching, it is a divergent thinking event and it is the most important indication of creative thinking (Guilford, 1957). Divergent thinking is defined as the ability to find as many as possible answers to a particular problem. It is seen that from past to present, sketches of many architects are used as a tool for solving a certain design problem by offering different alternatives. This situation once more emphasizes the strong relationship between creativity and sketches. Fish and Scrivener (1990) are also of the same opinion: they say, "Sketching amplifies the mind's ability to translate abstract propositional / descriptive information into concrete visual / depictive information" (p. 123).

Torrance (1974, 2000) developed the "Torrance Test of Creative Thinking" (TTCT) based on Guilford's concept of "divergent thinking" in order to evaluate creativity. According to TTCT, fluency, flexibility, originality and elaboration are the most important indications of creativity. Mostly, sketches are used to create different alternatives in certain design situations, to find an original idea instead of using conventional ways, to become flexible about changing ideas and to elaborate on the main idea. Consequently, they comply with the definitions of these concepts.

Tijus (1982) defines creativity "...as innovation in art practice through establishes new links between separate universes" (p. 172). Popper (1977) clarifies the concept of these separate universes as follows, "...we may



distinguish the following three worlds or universes, first, the world of physical objects or of physical states; secondly, the world of states of consciousness, or of mental states, or perhaps of behavioral disposition to act; and thirdly, the world of objective contents of thought” (p. 106). According to his conceptualization, sketches belong to the first world as physical objects and images in the designer’s mind belong to the third world. On the other hand, according to Popper’s conceptualization, the design process belongs to the second world. Tijus’ definition of creativity also implies a direct relationship between sketching and creativity because, within the framework of Popper’s conceptualization, sketching serves as a link between the third world and the first world. This is not a unilateral link; it is bilateral in the context of our previous explanations and as it changes constantly, it is inevitably new considering the nature of creative design processes. For Gotesky and Breithaupt (1978), “...creativity is associated with the spontaneous, the unexpected, and the unskilled” (p. 25). Sketching is related to these characteristics of creativity because it requires being spontaneous, unexpected and unskilled. A designer transfers the images in her/his mind to paper spontaneously in order to catch an unexpected situation and s/he generally has no claim to attain a skillful profile. Sketches externalize the images in visual memory as they require the hand to be used actively and efficiently, and once again it is related to creativity. As Goldschmidt states (2006), “Any learning theory will support the superiority of ‘hands-on’ involvement in an effort to learn and create something” (p. 109).

## **Conclusion**

Designing an activity of solving ill-structured and highly complicated problems, is different from classical problem solving in cognitive psychology and thus, requires creativity. Design experiences and research made on them demonstrate that the sketches magnify the mind’s ability and facilitate creative transformations in design. Because of this, sketches are basic tools of architectural design studios that are a highly sophisticated milieu of creative problem solving. However, generally design studios and specifically sketches are seen as non-rational ways of learning and thus, they do not get the encouragement they deserve in modern research universities. The concept of a scientific ideal based on natural sciences is dominant in such environments. As a conclusion, the current value system in this environment which accepts the superiority of verbal and computational ways of thinking over praxis and visual thinking does not give necessary importance to the architectural design praxis.

An important point neglected by people who give primary importance to theory by modeling themselves after science are the fundamentally different roles of theory in science and design. This difference arises from the fact that theory and praxis are separate and sequential; that is, theory guides praxis in science but is interwoven in architectural design; because of that the boundary between them becomes ambiguous in this process. This ambiguity is more or less valid for other fields as well. However, in this respect, design has a significant difference; that is, design is an activity in which praxis and theory continuously generate each other. The situation becomes quite apparent during sketching processes. No matter which theory is taken first, sketches create new associations in a designer’s imagination and the designer continues to do her/his emancipated searches in the design territory. So the theoretical essence foreseen in the beginning loses its control. Although it is an undesired situation in the context of the scientific ideal, it is a necessity for the designer always aiming to discover

new lands which have never been mapped. In fact, the most critical point for architectural design activity is to find mediums to create a better architectural design and to have a better architectural environment. We have not sufficient evidence that architectural theory could be a medium to achieve this end by itself; however, there are many instances in which the experience field of design is expanded through sketches. There is no serious disagreement about the functions of theory in design such as understanding, criticism, interpretation, persuasion and communication. The problem is that additional importance is given to theory beyond these functions and it is seen as a guide and authorizing argument of truth for creating better designs.

The aim of design is not to answer a question or solve a problem, unlike science and mathematics. The problem here is originated by the designer. In a way, designing is a process of solving a self created problem for a designer. Sketches are the tools of a designer to create a problem and then solve the problem created. The man-made environment can also be called "secondary nature". Sketching is a phase of the design process in which the designer feels her/himself the creator of this "secondary nature" at most because the main idea of design is found during these processes and then improved by refinement. In a way, architectural design studios are intellectually adventurous environments where one can develop one's "mind muscles" metaphorically as in the case of "body building". These sketches which magnify mind's capacity facilitate this adventure and make it joyful. The most recent experimental studies about creativity indicate that the creative process is a spiral structure which consists of cyclical loops of feeling, responding, evaluating, selecting and communicating. As they are the direct correspondences of this process, sketches are important in creative design and thus, design studios. Sketches are means of self communication which make our internal worlds much more clear and understandable even for us. This process which is defined as personal dialogue has the potential to help us attain a new understanding and consequently, a new design situation. In this respect, the ambiguity of sketches is not a negative characteristic; on the contrary, it helps us see new opportunities and brings about positive developments and transformations. Our percepts are not absolute; they are hybrid formations created by superimposed images coming from the retina and accumulated in our long term memory. As the ambiguity of sketches changes these hybrid structures created by superimposed images, our images are kept vivid stimulated by a multiplying effect. As the sketches makes change the mind of the designer constantly, s/he can see an opportunity in her/his next sketch which had been overlooked in the previous one. Sketching deserves to be one of the basic tools of design studios which are the milieus of highly sophisticated means of creative problem solving. Its capacity shows that it is a divergent thinking and one of the most significant indications of creative thinking. One of the definitions of creativity is "Innovation in art practice through establishing new links between separate universes". According to Popper's conceptualization, these universes can be divided into three categories; physical objects or physical states, mental states and objective contents of thought. Sketching is an activity of establishing new links among these three universes. Within the framework of this conceptualization, sketches are seen as effective tools of creative problem solving in design studios. There is a relationship between creativity and spontaneity, unexpected and unskilled from this point of view as well. Sketches closely connected to these concepts go together with creativity.

In contemporary research universities, while great importance is given to theory, praxis is ignored. Consequently the role of sketches in design studios is underestimated. There is no critical disagreement between the design educators about the necessity to create a balance between theory and praxis; however, there are some difficulties in continuing practically with this education in such an understanding. Design instructors are in an impotent situation against the scientific ideal dominant in the educational system. Especially in modern research universities, this domination causes many other unique requirements of different disciplines to seem trivial at every stage. In order to redress the balance between theory and praxis in architectural design education, employing visual thinking as required in this unique fashion of edification and giving a primary role to sketches, this domination of a scientific ideal should be eliminated.

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#### **Yaratıcılık açısından eskizlerin tasarım eğitimindeki rolü ve bilimsel idealin etkisi**

"Kötü huylu" ve hayli karmaşık problemleri çözme aktivitesi olan tasarlama, bilişsel psikoloji'deki geleneksel problem çözmeye göre farklı ve bu nedenle yaratıcılığı gerektiren bir faaliyet şeklidir. Eskizlerin zihni kapasiteleri artırarak tasarımda yaratıcı dönüşümleri kolaylaştırdıklarını tasarlama deneyimleri ve bu deneyimler üzerine yapılan araştırmalar göstermektedir. Bu özellikleri nedeniyle eskizler yaratıcı problem çözmenin hayli sofistike bir ortamı olan mimari tasarım stüdyolarınının temel araçlarından biridir. Ancak, genel olarak tasarım stüdyoları ve özel olarak da eskizler rasyonel olmayan bir öğrenme şekli olarak görüldüğünden hala "Newtonian" esaslara bağlı modern araştırma üniversitelerinde genellikle yeterli anlayış ve desteği bulamamaktadır. Bu ortamlarda egemen olan doğal bilim esaslı bilim idealinin kuram ile sözel ve sayısal anlatımı, uygulama ve görsel anlatıma göre daha üstün gören değer sistemi mimari tasarlama praxisinin bu önemli aracının ikinci plana itilmesine yol açmaktadır. Tasarlama eğitimini kendi ontolojik gerekliliklerinden uzaklaştırdığı için bu tartışılması gereken bir problemidir. Bu problem bağlamında makalemin

birbirine bağılı iki amacı vardır. Birincisi, yaratıcı tasarım anlayışı açısından görsel düşüncenin ve bu çerçevede eskizlerin rolünü irdelemektir. İkincisi ise, ağırlık kazanmış kuram kavramının tasarlama eğitiminde oynayabileceği rolün sınırlarını tartışmaktır. Bu tartışma tasarımla ve stüdyo eğitimiyle ilgili direkt kaynaklara, yaratıcılık ve bilim felsefesi alanlarındaki çalışmalara ve buralarda öne sürülen görüşlerden konumuza ilişkin çıkarsamalara ve farklı kaynaklar arasında kurulan bağlantılara dayanarak eleştirel bir metotla yapılmaya çalışılacaktır.

Tasarım eğitiminde bilimi örnek alarak kuramsallığa birincil önceliği verenlerin gözden kaçırdıkları önemli bir nokta vardır. O da, kuramın bilim ve tasarımdaki farklı rolüdür. Bu farklılık bilimde kuram ve uygulamanın ayrı ve ardışık durumu ve buna bağılı olarak kuramın uygulamaya rehberlik etmesi, mimari tasarımda ise uygulamayla iç içeliği ve aralarındaki sınırın bu nedenle belirsizleşmesidir. Bu belirsizlik bir ölçüde başka alanlar için de söz konusudur. Ancak bu bakımdan tasarlamanın önemli farkı, onun uygulama ve kuramın birbirlerini karşılıklı ürettikleri gerçeğinin hemen her an yaşandığı bir süreç olmasıdır. Bu durum en fazla eskiz süreçlerinde belirginleşir. Hangi kuramsal düşünceden başlanırsa başlansın yapılan eskizlerin tasarımcının imgeleminde oluşturduğu yeni çağrışımlarla, tasarımcı tasarımın egemenlik alanında özgür arayışlarını dilediğinde sürdürür ve başlangıçta öngörülen kuramsal esas da bu arada kontrolünü kaybeder. Bilim ideali açısından bu olumsuz sayılan ve istenilmeyen bir durum olsa da, haritası çizilmiş coğrafya parçalarının dışında alanları keşfetme idealindeki tasarımcı için kaçınılmaz bir durumdur. Mimari tasarım faaliyeti açısından önemli olan nokta, daha iyi bir tasarıma hangi araçlarla ulaşılabileceği ve daha iyi mimari çevrelerin nasıl ortaya konabileceğidir. Mimari kuramın tek başına bunu sağlayabileceği bugüne kadar kanıtlanabilmiş değildir, ancak eskizler aracılığı ile tasarımın deneyim alanını genişleten sınırsız örnek vardır. Tasarlama kuramın, yeni kavrayışlara ulaştırma, eleştirme, yorumlama, ikna etme, iletişim kurma gibi hayli geniş ve önemli işlevleri olabileceği konusunda fazla bir tartışma yoktur. Problem, kurama bu işlevlerin ötesinde bir önem atfedilmesinde, onun tek başına daha iyi tasarımlara ulaştıracak bir rehber, tasarlama ve değerlendirme süreçlerinde gerçekliğin otoriter bir argümanı olarak görülmesindedir.

Tasarım süreçlerinde bilim veya matematikte olduğu gibi cevabı verilmemiş bir sorunun yanıtlanması veya spesifik bir problemin çözümü amaçlanmaz. Buradaki problem tasarımcı tarafından yaratılır. Tasarlama bir bakıma tasarımcının kendisi için bir problem yaratıp onu çözme sürecidir. Eskizler tasarımcının hem kendi kendisi için bir problem yaratma, hem de yarattığı bu problemi çözme aracıdır. Mimari çevre “ikincil doğa” olarak da tanımlanabilmektedir. Eskizler tasarımcının bu “ikincil doğa”nın tanrısı olduğunu en fazla duyumsadığı süreçlerdir. Çünkü tasarımın temel düşüncesi bu süreçlerde bulunur ve detaylandırılarak geliştirilir. Bu süreçlerde tasarımcı dilediği sonuca ulaşabilmek için problemi değiştirebileceği gibi, kendi alanındaki her yasayı da değiştirebilecek veya yeni yasalar yapabilecek tanrısal güce sahip görünür. Mimari tasarım stüdyoları bir anlamda “body-building” gibi “zihni kasların” yaparak öğrenme egzersizleriyle geliştirildiği bir entelektüel serüven ortamıdır. Zihni kapasiteleri artıran özellikleriyle eskizler bu serüveni kolaylaştırır ve zevkli bir hale getirirler. Yaratıcılık konusundaki en son deneysel çalışmalar, yaratıcı sürecin, duyumsama, tepki verme, değerlendirme, seçim ve iletişimin dönüşümlü yaşandığı spiral bir strüktürü olduğunu göstermektedir. Bu nitelikteki bir süreç tam karşılık geldikleri için de yaratıcı tasarlama ve dolayısı ile tasarım stüdyolarında eskizlerin önemli bir fonksiyonu vardır. Eskizler kendi kendimizle iletişim kurmayı sağlayan, imgelem dünyamızı kendimiz için de daha belirgin ve kavranabilir kılan araçlardır. Kişisel diyalog olarak tanımlanan bu süreç bizi yeni bir kavrayışa ve bunun sonucunda da yeni bir tasarım durumuna ulaştırma potansiyelini taşır. Eskizlerin belirsiz yapısı olumsuz bir özellik değildir, aslında tam tersine bizim onlarda yeni olanakları görmemizi sağladıklarından tasarlama süreçlerinde olumlu gelişim ve dönüşümlere neden olurlar. Algılarımız mutlak olmayıp, retinadan gelen direkt imajlarla görsel belleğimizde uzun sürede birikmiş olan imaj repertuarımızın üst üste örtüşmesinden doğan melez bir oluşumdur. Eskizlerdeki belirsizlik, imajların üst üste örtüşmesiyle oluşan bu melez yapıyı sürekli değiştirdiğinden imgelemimiz çarpan etkisiyle sürekli uyarılarak canlı tutulur. Yaptığı eskizler tasarımcının belleğini sürekli değiştireceğinden, bir önceki eskizinde göremediği olanağı bir sonrasında görebilecek ve görüşleri her an sürekli genişleyecektir. Eskiz yapma bu kapasitesi ile

yaratıcı düşünmenin en önemli belirtisi olan bir "genişleyen düşünce" şekli olması açısından da yaratıcı problem çözmenin hayli sofistike bir ortamı olan tasarım stüdyolarının temel araçlarından biri olmaya hak kazanır. Yaratıcılığın bir tanımı da, "Farklı evrenler arasında yeni bağlantılar kurma yoluyla sanat pratiğinde buluş yapmadır". Popper'ın kavramsallaştırmasına göre bu evrenler fiziksel nesnelere veya durumlar, zihni durumlar ve düşüncenin nesnel içeriği olmak üzere üç grupta toplanabilir. Eskiz yapma bir anlamda bu üç temel evrenin, fiziksel nesnelere, zihni durumlar ve düşüncenin nesnel içeriği arasında yeni bağlantılar kurma faaliyetidir. Bu kavramsallaştırma çerçevesinde de eskizler tasarım stüdyolarında yaratıcı problem çözümüne yardımcı etkin bir araç niteliğinde görünürler. Bir görüşe göre yaratıcılıkla spontanelik, ansızın olma, maharet gerektirmeme arasında yakınlık vardır. Eskizler yaratıcılıkla yakından ilgili bu kavramlarla sıkı bir ilişkide görünmektedir .

Günümüz modern araştırma üniversitelerinde kuramın fazlasıyla ödüllendirilirken praxisin ihmal edilmekte oluşu, tasarım stüdyolarında eskizleri baş rol yerine düşük profilli bir rol ile yetinme durumu ile karşı karşıya bırakılmaktadır. Uygulamayla kuram arasındaki dengenin gerekliliği konusunda tasarım eğitimcileri arasında fazla tartışma olmamakla birlikte, tasarım eğitiminin fiilen böyle bir anlayış çerçevesinde sürdürülmesinde güçlükler yaşanmaktadır. Çünkü tasarım eğitimcileri, eğitim sisteminde kuvvetle egemen olan bilimsel ideale karşı seslerini fazla duyuramamaktadır. Eğitimin her kademesinde, özellikle modern araştırma üniversitelerinde bu egemenlik, doğal bilimlerin dışındaki disiplinlerin kendine özgü gerekliliklerini derin bir gölge altında bırakılmaktadır. Mimari tasarım eğitiminde uygulama ve kuram dengesinin yeniden kurulabilmesi, bu eğitim şeklinin gerek duyduğu ölçü ve kapsamda görsel düşünce çerçevesinde davranabilmesi ve buna bağlı olarak eskizlerin tasarım eğitiminde hakkettikleri baş rolü oynayabilmeleri bu derin gölgenin kalkması ile mümkün olabilecektir.