

***Title:***

**THE DANCE OF DESIGN AND SCIENCE  
IN FIRST YEAR STUDIO:  
CONTRIBUTIONS OF BILGI DENEL  
TO BASIC DESIGN IN TURKEY\***

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***Abstract:***

The theoretical framework of first year studio in Turkey has its roots during the establishment period of METU in 1956. International figures like Fritz Janeba and Marvin Sevely constituted the first year studio in Turkey and developed the application of the concepts borrowed from *Vorkurs* of Bauhaus together with the practical production of buildings in summer practices. Moreover, in the late 1970s and early 1980s is the period of teaching, forming and framing a scientifically oriented architecture in Turkey. Due to the scientific developments and technological innovations on international scale, architectural scholars shifted the focus and limits of architecture to systems theory, design thinking, behavioural experiments, building technology, and social and cultural analysis of the settlements. This period can be considered as the merging of design with science. During this collaboration of two disciplines, basic design education is exposed with a conception of “Scientific Design”.

Bilgi Denel has become a significant scholar in this period paving his own way of defining systematic design inside the studio. Criticising the Bauhaus Experience, Denel has produced

a paradigm shift in basic design education with systematic thinking and visual awareness in Turkey and developed an analytical and rational perspective within the architectural scholarship. General Systems Theory and Gestalt Principles have turned out to be the major sources for this novel practice of this type of basic design in Turkey. Denel's texts on basic design education has defined a new pedagogy, a new form of teaching design, in the departments of architecture and an original model to teach basic design based on a scientific view of design. One of the methods introduced for that mental system is exposed in the book *A Method for Basic Design*.<sup>1</sup> Additionally, in the book of *Temel Tasarım ve Yaratıcılık* (Basic Design and Creativity)<sup>2</sup>, this particular method for basic design is taken as an attempt for searching the creativity and its limits of basic design in the architectural education.

Since basic design education is the platform for introducing, defining and discussing the primary concepts of design and its elements together with the scholars and the students, these investigations allow tracing the arguments on design process in terms of making architecture scientific, especially in terms of the conceptualisation of space in local level. For this paper, the limits of basic design are discussed to understand and position the role of science in design education reviewing the pedagogical tools of Denel on spatial suggestions in Turkey. Together with the other attempts of making architecture more scientific such as Design Methods and Environmental Behaviourism, the association of design and science in mentioned period develops a significant legacy for understanding the recent developments in basic design education and defines a rich fragment in the route of architectural pedagogy starting from *Vorkurs* of Bauhaus to *Inchoate* of ETH<sup>3</sup>.

***Keywords:***

Design Methods, Basic Design, Scientifically Oriented Architecture, Architectural Education in Turkey

***Main Text:***

**Introduction**

In the international journey of basic design, starting from the early works of Denman Waldo Ross and Arthur Wesley Dow in USA to Bauhaus in Weimar, Dessau, and Berlin, Vkutemas in USSR to Hochschule für Gestaltung in Ulm, New Bauhaus to Inchoate in Switzerland, the relationship of science and design is becomes a major issue parallel with the argument of reason. Design Methods by its venture in opening “black box” to achieve a complete “glass box” use scientific methodology to examine design activity. Protocol analysis to reflection-in-action methods enriches this marriage of design and science. Philosophical contributions and experience based implementations pave the way of the methodology in design activity especially for basic design.

In this paper, we would like to dwell on the venture of scientification of architecture and examine the contribution of Bilgi Denel as a creative figure in basic design education in Turkey. His texts become the source for us to underline the dance of design and science in local level with its international connection.

Between the late 1950s and early 1980s architectural studies in Turkey of the period concentrate by the help of scientific methods on various architectural issues and research topics such as intuition of designer, behaviour patterns, and energy efficiency of buildings. Scholarly studies concerned with the assessment of architectural projects and the evaluation of buildings evolve into the methodological consideration of architecture by using “systems of inquiry” provided by the sciences of psychology, anthropology and sociology and are thus enhanced with novel interpretations of the scientific terminology.<sup>4</sup> This trend is named as the scientification movement in the paper and defines a novel type of scientifically oriented architecture that leads to the “Architectural Sciences” in Turkey.<sup>5</sup> Moreover, it houses the teaching practices for design

activity and the methodological differences in architectural research inside the academic world.

The particular era that spans from 1950s to 1980s is considered as the establishment period of pluralistic architectural sciences much influenced by the international sources. One prominent example is the graduate program of Building Sciences and Environmental Design (BSED) at METU Faculty of Architecture, proposed as an individual department in 1976 but built as a graduate program in 1979.

### **Motivations for Architectural Sciences in Turkey**

Academic realm in Turkey walks its own route in forming a more scientific architecture although it has remarkable international relations depending on the personal interests of the movement. Three motivations become more significant among the architectural routine of the previous questions in forming a scientifically oriented architecture such as *routinisation*, *institutionalisation*, and *socialisation* that develop a distinction.

First motivation, rotinisation in architecture, pertains to the sources of Turkey. According to the limited sources, architecture in Turkey had no luxury in producing failures of architects and irrational buildings parallel to the lack of scientific research production.<sup>6</sup> The term “routinisation in architecture” is to characterise this situation in Turkey as İlhan Tekeli introduces.<sup>7</sup> Routinisation is the attempt of transparent and collective understanding of design process in the production of the ideas about design, architecture and planning according to him. “Black box” as the term used for the closed and unknown activity of designer became what was a collective and open action design process as “glass box”.

The emerging possibilities of making design not only by the widely popular architects or highly talented actors but the “normal” and “ordinary” people who are educated in design and architecture schools introduced a paradigm shift in the field of design and architecture in the world as well as in Turkey.

Second motivation generated the architectural studies in terms of institution. The motivation institutionalisation in architecture included the opening of state based formations for the sake of developing reasonable and rational architecture and planning with scientific methodologies. After the foundation of State Planning Institution (DPT – Devlet Planlama Teşkilatı), Turkish State started to regulate sources of Turkey and proposes 5-year-development-plans for rationalisation of the economical investments as an active actor in building sector after the military coup d'état in 1960.<sup>8</sup>

One of the prominent institutional foci of this motivation to build up a more scientifically oriented architecture became METU with its transforming curriculum as an international university in Ankara. METU, during its establishment period, houses also a rational perspective in the production of planners and architects with its curriculum in global scale. METU contributed in at least three major areas to the architectural education. First novelty was the basic design education in METU. The main aim of the Basic Design is to get rid of all the initial conceptions of design process, which students had gained throughout their personal life.<sup>9</sup> Second one is the summer practices of METU.<sup>10</sup> Field practice in construction site lasting approximately eight weeks was required in the curriculum. The students are encouraged in order to lead the awareness of investigating the basic problems of the Middle East and Turkey through the practical methods of analytic thinking.<sup>11</sup> Finally, ÇEMBİL (Çevre ve Mimarlık Bilimleri Derneği – Society for Environment and Architecture Sciences) and the department of Building Sciences and Environmental Design (BSED) as mutual organisations are the pioneer institutions in METU on the studies for forming a scientifically oriented architecture.<sup>12</sup>

The scholars in universities such as ITU, KTU and METU elaborate architectural studies in numerous fields. They participate in significant number of conferences and publish architectural works in the favour of forming a scientific architecture. However, METU Department of Architecture stands for being one of the generator institution through the

venture within other departments in ITU, İDMMA, ADMMA, Ege University and KTU.

Third motivation of forming more scientific architecture relied on the political concerns of Turkey. “Socialisation in architecture” generates the atmosphere of the scholarship in its uniting attempt of architecture and social demands in Turkey. It is the motivation of strengthening the relationship between architect, scholar and society through the social organisations and actions.

The Chamber of Architects of Turkey established in 1954 turned into a platform for realising these political demands of architects as educated technicians. By the means of reports and campaigns, educated technicians produce solutions to the problems of the country as social engineers.<sup>13</sup> As an example, in 1971, Ankara Branch of Chamber of Architects declared a report for the problem of technical education.<sup>14</sup> The report ended with a declaration of “Devrim İçin Teknik Eğitim (Technical Education for Revolution)”. The problem of social housing and the questions of building production and urban solutions in the field were the key discussions on social demands influenced the atmosphere in the architectural scholarship of Turkey.

These three motivations in Turkey define a paradigm shift in the field of architectural scholarship having one particular perspective in common. All of them are based on the totalising world view which resonates together with the system approaches. The influence of system theories and its variations inside the architecture has its traces in design activities and architectural research. The notion of design activity, once being understood as black box, turns into “translucent” glass box by the help of holistic scientific approaches. This glass box has its components, input, output, and environment as a total system having parts-whole relationship.

### **Bilgi Denel and *A Methodology for Basic Design***

Basic design education in Turkey penetrates into the architectural education through the curriculum of METU.<sup>15</sup> The

adaptation of basic design education from the international sources into METU architectural curriculum was accomplished in 1960s starting with the early implementations of Fritz Janeba as the key figure in METU first year studio.<sup>16</sup> Later, Bilgi Denel published various texts on the basic design education proposing a special design methodology. One of these texts is “Bauhaus’ta Temel Tasarım (Basic Design in Bauhaus)” in the first bulletin of METU Faculty of Architecture in 1971.<sup>17</sup> He argues that there is a lack of holistic approaches inside the studio and states the need for a modification in the light of specific circumstances in Turkey.

Denel defines basic design as a mental system with a strong emphasis on its visual dimension and considers it as the foundation of and beginning of architectural education.<sup>18</sup> He rejects the complete acceptance of Bauhaus practice in basic design and introduces a local program.<sup>19</sup> One of the methods introduced for that mental system is introduced in the book *A Method for Basic Design*.<sup>20</sup> In addition to that, in the book of *Temel Tasarım ve Yaratıcılık (Basic Design and Creativity)*<sup>21</sup>, this particular method for basic design is taken as an attempt for searching the creativity and its limits of basic design in the architectural education.

Denel states the objective evaluation of his proposal for basic design for revealing these points.

- “a) The process of the method tries to free the students from many years of subscribing to the tyranny of text books plus the undisputed autocracy of high school teachers and,
- b) In the face of using permanent values and proven rules, inventing, formulating, and proving their own suit their set rules within a wide spectrum of inevitable general restriction,
- c) Learning self discipline, answering rationally for one’s own doings, taking responsibility to prove to enhance our environment in a socially conscientious way that will also give personal satisfaction in accomplishment.”<sup>22</sup>

Consequently, the paper chooses to examine the methodology of Denel in order to trace the venture of forming scientific design activity. His line with the extensive methods on transmitting design stands for a fruitful source in the context of scientifically oriented architecture. His transparent, systematic, and analytical approach to basic design methodology makes the perspectives on design activity more questionable.

### **Scientific Methodology and Basic Design**

During the process of transmission, namely the teaching process in the basic design studio, the students of architecture define individual method of communication with individual experience. The notion of intuition seems to be neglected in the design studies with the influence of forming scientific architecture. Some scholars discussed science and intuition as a binary opposition and defines intuition as part of the idealistic production of architectural design<sup>23</sup>. He examines both intuition and creativity as an object of scientific methodology. His analytic perspective aims to clarify this blur and basic concepts of design studies.

“First of all a language must be developed with a minimum vocabulary. This will be the first step for the necessary communication. Since the visual world comprises the bulk of the architect’s preoccupation, a language of vision that culminates in visual awareness is essential. Here one must be very careful because one of our present day handicaps lies in the proliferation of words. By reducing them to a minimum and carefully defining them, we can order them to the extent that we can call them facts. Then when we know one fact well by manipulating it, we can learn so many from it.”<sup>24</sup>

Denel underlines that the process of seeing only makes scale-based comparisons and this visual skill leads only to the construction of groups for a structure, namely visual grouping.

Here, visual geometry helps to construct this structure upon the unique and logical rules that are defined through the perception of the eye.<sup>25</sup> According to Denel, this process is the key for defining the relations between design and order for designer.<sup>26</sup>

As it is mentioned above, two issues discussed in the design studio are creativity and intuition, but in order to reinforce them.<sup>27</sup> Within the methodology, Denel admits that there is no education of creativity. He defines creativity in education as the ability of original production of design; however this idea of design has to be transmitted with a systematic language of communication, namely visual vocabulary of design. However, they employ the scientific approach in producing more solutions and variations during the studio in order to facilitate the improvement of individual creativity in studio. Denel exposes the need for a simple, defined and easy theory for basic design.<sup>28</sup> For him, basic design has to rely on the scientific truths with abstractions as long as it is falsifiable.

Additionally, Denel underlines the relationships between design process and the notion of intuition. He defines the limits of intuition in architectural design in three phases: accumulation of experience, control of the system by logical thought and the determination of functional relevance. The notion of intuition with the systematic approaches in the activities of design process helps to define the proposals of designs in terms of production, representation, communication and visual perception. He merges intuition with the systematic methods and the principles of the Gestalt Theory. He underlines that this theory is not only a source for adopting Euclidean geometry to spatial organisation, but also for answering the possible necessities in terms of defining flexible and open solutions of architects and designers.<sup>29</sup>

Denel introduces the term Synectics inside the studio for developing architectural design studies.<sup>30</sup> It is penetrated inside the studio with the sketch problems. During these studies, students are asked to perform and present solutions on the unthinkable, undefined and unexpected problems. The exercises of Synectics help students to see problems in different ways.

Unlike brainstorming, it is a better defined and structured method including sequential steps to develop alternative perspectives of perception for the students.

Regarding these perspectives of perception and totalising attitude in design process, Denel examines the artistic dimension of architecture in basic design education. Denel argues the importance of the rules and frameworks situated for understanding of the rational and aesthetic sides of architecture for visual perception. He limits the basic design studies by differentiating the concepts of economy, aesthetic and social consequences intentionally for abstracting the basic design education as intangible notions in design.<sup>31</sup>

Denel argues also the role of criticism in basic design in terms of idealism.

“Metaphysical arguments in basic design refer to the notion of being against logical positivism. Not only are metaphysical questions unanswerable but unaskable. Such notions may very well fit to the ideal that the teacher is know-all-God not to be questioned. Of course, such an argument, for all its seemingly worthiness in metaphysical philosophy, can not be acceptable in our logical approach in design.”<sup>32</sup>

### **Conclusion and Further Remarks**

The implication and institutionalisation of Basic Design in Turkey in from 1970s to late 1980s influenced the architectural education, especially in rational terminology. Synectics as a scientific tool and rejection to idealist explanation of design activity in 1970s is some of the contribution of Bilgi Denel *et al* in accordance to General Systems Theory. Criticism of Gestalt Principle and endeavour of local formation of basic design in Turkey is significant and form a source for making comparisons with the international experiences. Starting from this point, basic design education in Turkey needs a wider attention and criticism to achieve a historical analysis with its social and cultural context.

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\* This paper in the short summary of the dissertation “Teaching / Forming / Framing a Scientifically Oriented Architecture in Turkey between 1956 – 1982” in METU in Turkey.

<sup>1</sup> See Denel, B., *A Method of Basic Design*, METU Faculty of Architecture Offset Printing Studio, 1979, Ankara.

<sup>2</sup> See Denel, B., *Temel Tasarım ve Yaratıcılık*, METU Faculty of Architecture Offset Printing Studio, 1981, Ankara.

<sup>3</sup> See Angelil, M., *Inchoate: An Experiment in Architectural Education*, Swiss Federal Institution of Technology Zurich – Faculty of Architecture, ETH Press, 2003.

<sup>4</sup> The term “systems of inquiry” is used to name the different perspectives on architectural research and to reflect the epistemological and methodological approaches in architectural research methods. See Groat, L. and Wang, D.,

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*Architectural Research Methods*, John Wiley & Sons, Inc., 2002, p. 6-7 and also chapter 2 “Systems of Inquiry and Standards of Research Quality”, p. 21-43.

<sup>5</sup> For the proposal of the Department of Architectural Sciences, see İmamoğlu, V., (et al.), *Mimarlık Bilimleri Bölümü Önerisi*, METU Faculty of Architecture Offset Printing Studio, 1976, Ankara.

<sup>6</sup> See Boratav, K., *Türkiye İktisat Tarihi: 1923 – 2002*, İmge Yayınları, 2005, p. 107 – 116.

<sup>7</sup> Tekeli, İ., Tasarım Sürecini Bilimselleştirme Çabaları, *Mimarlık*, 148, 1976/3, Ankara, p. 59-62.

<sup>8</sup> See Boratav, K., *Türkiye İktisat Tarihi: 1923 – 2002*, İmge Yayınları, 2005, p. 107 – 170.

<sup>9</sup> *METU Catalogue, 1957–1958*, METU Faculty of Architecture Offset Printing Studio, Ankara, p.24.

<sup>10</sup> See the collection of the summer practices held by METU between the years of 1958 and 1974. Özkan, S. (ed.), *Mimarlık Fakültesi Yaz Uygulamaları*, Arp Yayınevi, 1975, Ankara.

<sup>11</sup> Uysal, Y., *The Formation of the System of Education at METU Faculty of Architecture 1956-1980*, Unpublished Master Paper, METU, 2003.

<sup>12</sup> For example, see Pultar, M. (ed.), *Çevre, Yapı ve Tasarım*, ÇEMBİL Publications, 1979, Ankara. (as the proceedings of the First Conference of Architectural Sciences in 26-28 September 1979) and Occasional Papers of ÇEMBİL as the publications of Architectural Science Workshop in METU Faculty of Architecture published by METU Faculty of Architecture Offset Printing Studio).

<sup>13</sup> In her chronological text, Göle refers to these socialistic ideals developed in the late 1960s. Regarding the positivist ideas and rationalist perspectives of the social actors in Turkey, she searches the relation between the leftist politics and social engineering. Göle, N., *Mühendisler ve İdeoloji: Öncü Devrimcilerden Yenilikçi Seçkinlere*, Metis Yayınları, (1986) 1998., p.20.

<sup>14</sup> *Ankara Şubesi Komisyon Çalışmaları*, Türkiye’de Teknik Öğretim Sorunu, *Mimarlık*, January 1971, p. 11 – 13. Commission members were Yavuz Önen, Turan Tamer, Osman K. Akol, Erhan Erdoğmuş. Consultants of the commission were Şefik Uysal, Prof. Nusret Fişek, Doç. Dr. Bozkurt Güvenç, Prof. Mümtaz Soysal, Mehmet Özgüneş, Doç. Nejat Erder, Haluk Pamir.

<sup>15</sup> Uysal, Y., *The Formation of the System of Education at METU Faculty of Architecture 1956-1980*, Unpublished Master Paper, METU, 2003.

<sup>16</sup> Özgüner, O., “ODTÜ’de Basic Design Uygulamaları”, *Mimarlık*, August, 1966.

<sup>17</sup> Denel, B., Bauhaus’ta Temel Tasarım, *METU Faculty of Architecture, Institute of Research and Development*, Bulletin no: 1, METU Faculty of Architecture Offset Printing Studio, 1971, Ankara, p. 95-106.

<sup>18</sup> Denel, B., *A Method of Basic Design*, METU Faculty of Architecture Offset Printing Studio, Ankara, 1979, p. 7.

<sup>19</sup> Denel, B., Bauhaus’ta Temel Tasarım, *METU Faculty of Architecture Institute of Research and Development, Bülten*, No:1, METU Faculty of Architecture Offset Printing Studio, Ankara, October 1971, p. 95-106,

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- <sup>22</sup> Denel, B., *A Method of Basic Design*, METU Faculty of Architecture Offset Printing Studio, 1979, Ankara, p. 164-165.
- <sup>23</sup> Tekeli, İ., Tasarım Sürecini Bilimselleştirme Çabaları, in the proceeding of the conference *Mimarlık Eğitimi* in Trabzon, TMMOB Publication, Ankara, 1976.
- <sup>24</sup> Denel, B., *A Method of Basic Design*, METU Faculty of Architecture Offset Printing Studio, Ankara, 1979, p. 18-19.
- <sup>25</sup> See the footnotes 6 and 7 in *Ibid*, p. 18-19.
- <sup>26</sup> See Denel, B., *Temel Tasarım ve Yaratıcılık*, METU Faculty of Architecture Offset Printing Studio, 1981, Ankara.
- <sup>27</sup> Denel writes a chapter on Synectics in Denel, B., *Temel Tasarım ve Yaratıcılık*, METU Faculty of Architecture Offset Printing Studio, 1981, p. 34-46.
- <sup>28</sup> Denel, B., *A Method of Basic Design*, METU Press 1979, Ankara, p. 171.
- <sup>29</sup> See Denel, B., Denel, B., *Temel Tasarım ve Yaratıcılık*, METU Faculty of Architecture Offset Printing Studio, 1981, p. 7
- <sup>30</sup> Denel hold a graduate course on Synectics as the part of the Department Architectural Sciences in late 1970s together with the participation of basic design studio as instructor in METU. See also Denel, B., *Temel Tasarım ve Yaratıcılık*, METU Faculty of Architecture Offset Printing Studio, 1981, p. 34-46.
- <sup>31</sup> Denel differentiates the more tangible notions and intangible notions in basic design. The more tangibles are visual structuring, physical structuring, light and scale; on the other hand intangibles are social, psychology, the subject of economics, movement, and aesthetics. Denel, B., *A Method of Basic Design*, METU Faculty of Architecture Offset Printing Studio, Ankara, 1979, p. 73-105.
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