THE PROCESS OF CREATIVITY AND CONCEPT DEVELOPMENT IN INTERIOR ARCHITECTURE DESIGN EDUCATION

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ABSTRACT
This study included the assessment of final project deliveries, interview and survey results of 67 freshman students of the Introduction to Design II course in the Department of Interior Architecture, Faculty of Architecture and Design at Kocaeli University, Turkey. The aim of this study was to reveal how concept development process affected students' understanding of design and their creativity in interior architecture design education. Within the scope of the study, the methods that the students used during the design process and the connections between these methods and design products were examined as well as the progression of those in the process who were directed to develop concepts. It was observed, as a result of the study, that the group who were informed about concept development process and were directed to develop concepts were able to generate original and innovative designs. In this context, it is thought that the study will contribute to improve the students' creativity by helping them consciously use concept development method in the design process.

Keywords: *Interior Architecture Design Education, Creativity, Creative Thinking, Concept Development*

İÇ MİMARLIK TASARIM EĞİTİMİNDE YARATICILIK VE KAVRAM GELİŞTİRME SÜRECİ

ÖZ
Çalışma, Kocaeli Üniversitesi Mimarlık ve Tasarım Fakültesi İç Mimarlık Bölümü, 1. sınıf Tasarıma Giriş II dersi alan 67 öğrencinin dönem sonu proje teslimlerinin, görüşme ve anket sonuçlarının değerlendirmesini içermektedir. Çalışmanın amacı, iç mimarlık mekan tasarımı eğitiminde kavram geliştirme sürecinin, öğrencilerin tasarım anlayışlarına ve yaratıcılıklarına olan etkisinin ortaya koyulmasıdır. Öğrencilerin tasarım süreci içinde kullandığı yöntemler, bu yöntemlerle tasarım ürünleri arasındaki ilişki ve kavram geliştirme yöntemini kullanmaya yönlendirilen grubun süreç içindeki ilerlemesi, çalışmanın kapsamı içinde incelenmektedir. Çalışmanın sonucunda, kavram geliştirme süreci hakkında bilgilendirilen ve kavram geliştirme yöntemini kullanmaya yönlendirilen grubun, özgün ve yenilikçi tasarımlar ortaya koyabildiği gözlemlenmiştir. Bu bağlamda çalışmanın, öğrencilerin tasarım sürecinde kavram geliştirme yöntemini bilinçli şekilde kullanmalarına yardımcı olacağı ve yaratıcılıklarını geliştirmelerine katkı sağlayacağı düşünülmektedir.

Anahtar Kelimeler: *İç Mimarlık Tasarım Eğitimi, Yaratıcılık, Yaratıcı Düşünme, Kavram Geliştirme*

INTRODUCTION
Students who enroll in the undergraduate programs of the interior architecture departments after the central entrance examination in Turkey may think that there is only a single answer and solution of a given problem, depending on the education they undergo before the university. Students who are used to convergent thinking can define the design problem only as a way to meet functional requirements.

When they realize that designing a spatial layout by selecting items and accessories is insufficient, they tend to create concepts that have no semantic depth. However, concepts that were chosen to ascribe a meaning to a design without enough consideration usually cause the design to be perceived superficially. This situation encountered in interior design education reveals the necessity of teaching students concept development.

Concept development includes concept and mind map methods that develop creative thinking and enable the students to visualize the thoughts in their minds. The concept development process supports the students' thoughts with words and images that come to their minds about the problem, allowing the students to convey these thoughts without any limitations. Because the students can see what they think altogether, they can focus on the problem and synthesize the data in the image that the concept development process creates. This method, by guiding the design, enables the creation of an original and innovative language of design.

The understandability of a design is improved if the concepts that make up the communication between the user and the space are compatible with the design product. At this point, what is also necessary to point out is that concept development is not a forced ascription of the spatial layout and other requirements to the format generated in the light of the chosen concept and idea. The aim should be to make an effort to get the best in a design according to spatial requirements and user requests.

CREATIVITY
According to Çellek and Sağocak (2014), creativity is an expression of the collective and sensitive inner life in different ways in the artistic, scientific and living process of creation. Bayazıt (2011) stated that the concept of creativity plays a role in the emergence of a new solution, a new method or a new tool as a remedy to a problem. According to Bessis and Jaqui (1973), creativity is an intellectual process that results in the creation of new and eligible ideas. A new product does not mean it has come to existence from nothing. A new idea is often either a combination of little-known ideas, or an old idea being transformed into a new environment or shape. Creative ideas must be valid. It is just not enough for them to be new. They also need to comply with the norms of benefit and use.

Creativity is a product of knowledge, imagination and evaluation. Without knowledge, there is no productive creativity. As the wealth of knowledge expands, new situations, organizations and ideas can be created. The third element of creation is to evaluate ideas and make them useful (Gürer, 1976). According to May (1994), creativity is the encounter of a person who is conscious with his own world. Creativity, in this context, is the evaluation of ideas created by knowledge and imagination. Because knowledge and imagination influence creativity, research concerning the problem should be done to improve creativity. Dorst and Cross (2001) indicate that the key point is to spend enough time to understand and identify the problem in the generation of creative designs.

Creative Thinking
J. P. Guilford put forward the idea of divergent thinking identified with creativity in the 1950s (Sternberg and Lubart, 1999). People with divergent thinking have the tendency to find innovations and unexpected. It is a creative way of thinking that suggests always looking for different ways of solution, and being not satisfied with a single solution. In this context, fluency, originality and flexibility are the most prominent features of divergent thinking (Runco, 1999). Similarly, Michael Polanyi (1958), a philosopher and scientist, has discussed explicit and tacit knowledge. He has described explicit information as a language that can be encoded and transmitted in the form of documents, instructions, graphs, information, and so forth. He has stated that it is difficult to format and communicate tacit information that is personal and contextually specific. According to Polanyi, tacit information is usually much more extensive than explicit information (Polanyi, 1966). Edward de Bono (1967), a researcher and instructor, has put forward the idea of lateral and vertical thinking. According to him, vertical thinking is the traditional logical thinking. It sets off from a problem and reaches a solution step by step. While vertical thinking deals with finding the right answer, lateral thinking is interested in finding a new idea, not finding the right answer (Barker, 2002). It is seen that scientists and theorists divide the ways

of thinking into two (Table 1). The first one is the way of thinking that aims to reveal a number of ideas, which covers the creative process, and the second one is the way of thinking that is result oriented (Kaya, 2016).

Table 1. The Relationship Between Ways of Thinking (Bessis and Jaqui, 1973).

Convergent, Explicit, Vertical, Normal Thinking	Divergent, Tacit, Lateral, Creative Thinking
Limited problem	Very large problem
Challenging data	Less challenging data
Sudden conclusion	Conclusion through accuracy and inaccuracy
A single result	Many results
Narrow investigation	Extensive investigation
The criterion of success is tough and challenging	The criterion of success is uncertain and less punctual

The education offered prior to university in our country, Turkey, is a form of education that corresponds to convergent thinking which asserts that there is only a single answer to a problem and in which only certain forms are accepted. Although in creativity, the divergent way of thinking is in the foreground, there is also a convergent way of thinking in the creative process. This way of thinking is employed to choose the logical idea from among many ideas. Starting the design process with the convergent way of thinking can prevent the person from generating creative ideas because of self-restriction. Therefore, at the beginning of the design process, the divergent way of thinking should be adopted, and an attempt should be made to bring forward many ideas without considering the realization of ideas. After that, these ideas should be evaluated in the convergent thinking style.

The process of creative thinking passes through a long preparation phase. It requires a good definition of the problem and preparation. In this preparation process, the person improves his experience and thinks about possible ways of solution by reading and writing, noting and discussing, questioning and exploring, and data collection and analysis (Gürer, 1976). Psychologist Graham Wallas (1926) refers to the phase after the "preparation" stage as the "incubation" stage. This stage may be short or long, but it is always there. Following that, the "illumination" occurs, bringing a sudden inspiration, and bringing forward the new invention. Cross (1997) considers this stage to be a bridge between the problem and the solution rather than a momentary leap. This stage where creative ideas are generated is the establishment of a connection between the stage where the problem is investigated and analyzed and the stage where the generated concepts are evaluated and begin to be analyzed. Then, there is the "verification" phase in which the emerging ideas are evaluated.

Creativity in Interior Architecture Design Education
The impact of the environment is substantial in developing creative thinking. In the development of the creativity of individuals, family, society and education are at the forefront. Most creative processes take advantage of other people's ideas or their driving force. Therefore, individuals should be offered interior architectural education, in which new ideas are taken into account and free thinking and creativity are supported, rather than traditional education.

There are different intensities of practice; theoretical, technical and vocational training; and aesthetic courses in interior architecture undergraduate education in Turkey. However, all of them have project/ interior design courses for practice where the theoretical knowledge is interpreted in the design process, and spaces are designed. In the project courses, students are expected to be able to analyze user needs, behavior patterns, tastes, and functional and comfort requirements of the space. In short, students are expected to correctly establish the user–function–space relationship and design such data in accordance with a concept. The project courses offered in the first semester have a special importance in the educational process especially for the acquisition of aforementioned behaviors and development of creativity of freshmen students who are introduced to design education for the first time.

Because creativity is a teachable and improvable ability (Robinson, 2001), various methods have been introduced to develop creative thinking. Conditional use of these methods in education can bring different creative outcomes with it. Moreover, these methods may be the solution to the problem of the

orientation of past experiences towards a mechanical tendency, which Lawson (1990) has mentioned. The attempt of the designer to solve design problems based on his or her experiences can drive the design into a mechanical cycle. The student work shown in Figure 1 is an example of reversing assumptions, which is a method for improving creative thinking. In the design of a book sales store, the student has embraced the idea that there should definitely be shelves on which books are exhibited in the space as a result of the knowledge he acquired in the environment where he lived before the university. In this case, he was asked the questions "what if books were not exhibited on shelves?" and then "what if there were not shelves in the space where books were exhibited?" The student who thought that the book store could not be designed without shelves was given the opportunity to consider the design problem from a different perspective by reversing his assumptions. As a result of such an approach, there were no books appearing in the space; only the information presenting the book types was presented. Books emerge when the compartments presenting the book types are rolled over.

Figure 1. An Example of Reversing Assumptions, A Method for Developing Creative Thinking —A Student Work

The attempt to make ideas about a problem visible by diagrams, maps and drawings is a very useful method to develop creative thinking. Albert Einstein always found it a necessity to formulate any subject he contemplated in different ways, including diagrams. He considered them not only mathematically and verbally, but also in visual and spatial forms. Identifying the problem as much as possible by reducing it to specific components ensures the determination of the most important parts of a problem and their boundaries (Michalko, 2001). In design studies, the presentation of ideas by using concepts, the visual expression of these concepts, the establishment and interpretation of inter-concept relations will grant students a versatile perspective. In this respect, students will begin to consider new assumptions and test new possibilities.

CONCEPT DEVELOPMENT
The term "kavram" in Turkish has been derived from the root "grasping," which carries the meanings of "catching" and "inclusion". The words concept and notion in Western languages are used as a synonym for the word "kavram" in Turkish. The term notion also bears the meaning of the initial information. However, the concept that means "mefhum" in Ottoman Turkish and "notion" in French is a general object that a person understands by passing objective impressions of senses through the abstraction process of the mind. The term of "concept" in Ottoman philosophy is defined as what the mind creates, and the term of "notion" is defined as what the mind acquires (Hançerlioğlu, 2015). Because notions are common considerations that people have about the qualities and characteristics of something, they have features which collect and compile expressions, and customize and generalize details. In this sense, the notion is the point of origin, the main idea, or the thought that leads the design, which contributes to the formation of the design in the study being done. It is the first step of the power of imagination and creativity in the design because of being a starting point specific to the designer and because of its abstract nature (Gençosmanoğlu, 2006).

A concept is the most tangible phenomenon that provides a direct expression of meaning, and gives clues about the intellectual infrastructure of the components that constitute the meaning. The first draft

that is generated in creative thinking is, in one sense, the essence of the idea/notion created in the mind, which is conveyed as a drawing. The concept, which leads to the drawing and also is the source of inspiration of the design, is the first point in which something abstract is transformed into something concrete (Turgay, 2009). In brief, a concept is the transformation of ideas — created by the designer to solve the design problem — into drawings and models.

Ching (1990) highlights the significance of visual expression of thoughts in the mind. A drawing does not take its final shape and get completed at an instant. Drawings depicting first thoughts are often experimental, fictional and explorative. However, the most important step, according to him, is the transfer of the first intuitive images onto paper.

Establishing a design with a concept means to choose from an infinite number of ideas, forms and materials that exist in the designer's mind. The efficiency of the design process is increased, and many creative ideas can be generated with the help of concept and mind maps that present such ideas by embodying the ideas. Studying by creating concepts for solving the problem in the design process is called the method of "concept development". Concept development can provide designers with a variety of topics ranging from the idea stage of design to the selection of shapes, forms, colors, textures and materials in which the design begins to become concrete.

Concept and Mind Maps
One of the techniques ensuring a visual expression of ideas about design problems is a concept map. A concept map is a brainstorming done by writing that allows broad thinking, which focuses on a subject, an idea, or directly on an artifact. A concept map is a method in which the concepts related to a topic are learned and investigated, and in which studies that have been carried out are seen together (Kırışoğlu, 2009). In this method, the student can approach the basic ideas and the relationships between them by using a wide perspective, establishing links between previous information and the new one. Concepts that are put forward about the solution of a problem should be associated with each other and made meaningful. Depending on the mutual relationships of the concepts, concept maps can vary in formal ways. For example, in hierarchical concept maps, the main concept specified is placed at the top of the page, and the scope of concepts gets narrower towards the bottom. In spider concept maps, the main concept is placed in the center because there is no hierarchical relationship between other concepts created from the main concept, and the other concepts are associated with the main concept. It is often seen that several types of concept maps are used in design education (Figure 2).
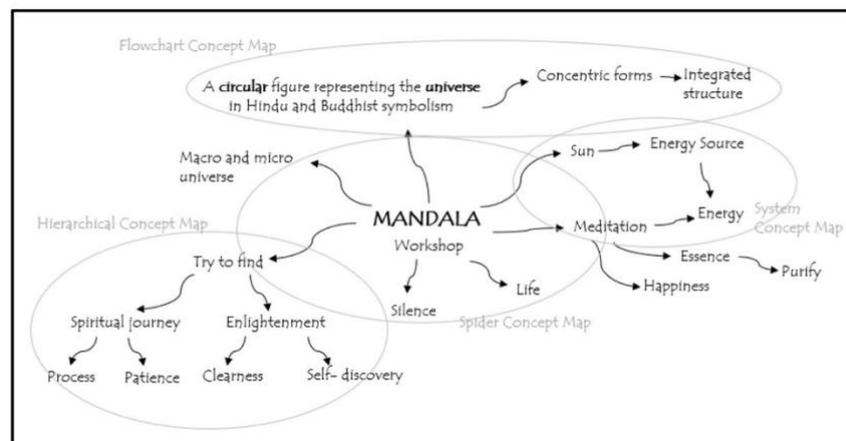
Figure 2. A Concept Map Example — A Student Work

The combined use of a concept map and a mind map particularly in design education, or the sole use of a mind map ensures that a student more understandably expresses his thoughts about a design problem. Mind maps and concept maps can occasionally be confused with one another. Mind maps are methods in which concept maps are supported by visual presentational tools such as images, diagrams, shapes, and so forth (Figure 3).
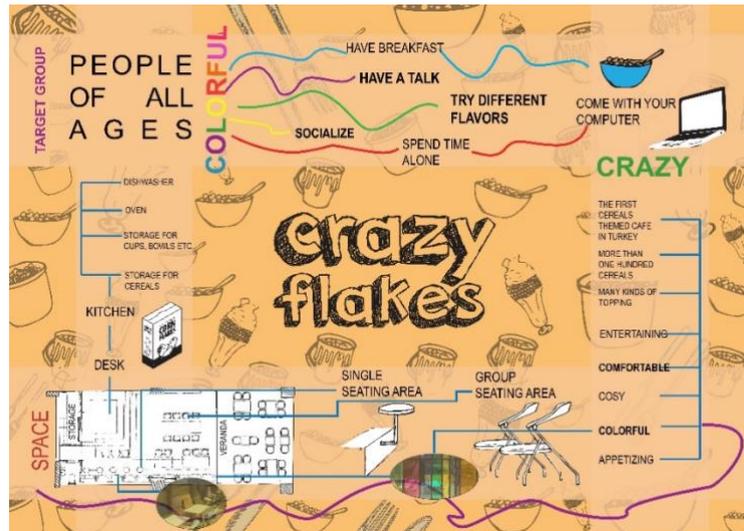
Figure 3. A Mind Map Example — A Student Work

Concept Development in Interior Architecture Design Education
In the process of designing interior spaces, the interior architect determines a concept to reveal the main quality of the design. Designers can use the word "concept" in many different meanings and formats. Any kind of concept, image, and metaphor can be called the concept or the main idea of a design without any exceptions. There can be differences between a faculty member's understanding of a "concept" and a student's or a less experienced designer's understanding of a "concept." Some designers are seen to start the design process with a specific and clearly defined concept, and develop a design through that concept. Some others, on the other hand, may be found to set off with an understanding of a concept that is fuzzy and not very apparent, and develop both a design and the concept in the design process. Some designers believe that they do not use concepts within the design process, while others think that the concept is somehow reflected in the design even if subconsciously (Turan, 2002).

There can be many diverse forms in which a concept is reflected in a design. The point that is important here is to know that strained ideas that are thrown out just to come up with a concept for a design will cause the design to be perceived as superficial. The designer creates concepts with ideas based on his experiences about the problem. Each designer should visually articulate these ideas that occur in his mind. At this stage, the ideas should be analyzed and the necessary syntheses should be carried out. The designer should consciously choose the ideas that will create the concept by passing them through his filter of thought. Solving the problem of a shoe store by imagining its external appearance in the form of a shoe box, which is one of the first ideas that can come to mind, can be given as an example of this situation. When designed through such a point of view, a space is unable to convey the vision and message of the company to the buyer. The production of shoe boxes, whose reason for being is to protect, store and sell shoes, is not the same as the belongings, the needs, and the corporate identity of the shoe store (Kaya and Aytıs, 2019).

The choice of starting points such as a "tooth" for a dental hospital design and a "horseshoe" for a riding center design, without giving much consideration, are indicative of a solely formal approach to design. When a dental hospital is assigned as a theme, the first idea that comes to mind may be a tooth, but this is not sufficient. It is necessary to consider events with their essential characteristics and abstract forms rather than descending into the depths of mind, properly analyzing the concepts in the mind map, and thinking about them in a tangible way. At this point, there should be no such perception that it is wrong to go forward with direct analogical approaches in design studies. What is being considered here is the fact that a structure created without due consideration will not be an architecture.

Students in Turkey who are educated to find a single answer throughout their educational lives prior to university are often unable to know how to proceed, when faced with an educational approach requiring a multidimensional perspective and creativity. The majority of students passing through this kind of

educational process use the concept of "functionality" in design, unaware that a function can also be a concept. However, initiating a design by targeting functional requirements leads to the inability to undergo a process in which creativity, productivity, and new and rich ideas are put into action before the design. Ensuring the conditions of comfort required by a function is the responsibility of every designer. However, most students, who begin making a design in line with a function, experience a problem as to how they will proceed after generating a spatial layout. They do not know what kind of an atmosphere to create in the space, and which materials, shapes and forms to use. The problem that arises at this point may originate from the possibility that the student has not analyzed the design problem and user concepts in detail at the beginning. It is necessary to spend quality time and do research to identify and narrow down the problem. This is because it is highly likely that a person encounters information that he is unaware of and that can be connected with as he investigates. A successful design, according to Cross (2004), depends on the identification of an adequate scope of problem, the collection of adequate information in accordance with a focused or directed approach, and the determination of the priorities of criteria. The framing of the problem, namely the configuration and formulation of the problem, is the key to a successful design.

It is possible to divide concept determination approaches into two, concept determination with convergent and divergent thinking (Table 2). The first involves the subjects of a concept covered by a concrete, convergent way of thinking, which are defined as environmental data, technical data, human data and so forth, and in fact are the requirements for providing the functionality in the space. And the other involves the concepts that are open to a subjective approach, such as creativity development methods, culture, art movements and designer curiosity, which can mainly reveal creativity, and which can be created through divergent thinking (Kaya, 2016). These two ways of thinking are the forms of thinking used together in a design, which will ensure the integrity of the design in terms of meaning, function, and form. Lawson (1990) has discussed these distinctions as qualitative and quantitative criteria. He has stated that a design is rated by assessing qualitative and quantitative criteria, and that designers have to be able to balance these two types of criteria in their decision-making processes.

Table 2. Concept Determination Through Convergent and Divergent Thinking (Kaya, 2016).

| Through Convergent Thinking Concept Determination	Through Divergent Thinking Concept Determination
Function Interspatial relations User profile Number of users and so forth	**Methods of Creativity** Concept and Mind Maps Brainstorming Synectics Reversing Assumptions and so forth
Environmental Data Terrain conditions (Data such as the geographical position, orientation, wind, and sun) Spatial data (Data such as the user profile, number of users, and measurement)	**Connotation and Figurative Meaning of the Word** **Historical Analyses** **Artistic and Architectural Movements** **Fine Arts and Architecture**
Technical Data Structure Safety Acoustics Heating/Ventilation Installation Lighting Material Laws, Regulations and so forth	**Culture** Mythology Legends Epics, Stories Songs, Ballads Dances Local Clothes Architectural elements and so forth **Brand/Corporate Identity**
Human Data Health Psychological Social Ergonomics and so forth	**User Requests/Profile** **Designer Experiences/Requests/Curiosity and so forth**

FINDINGS AND EVALUATION

During the study, it was observed that the design problem was not sufficiently thought out, that the necessary research was not done, and that the functional requirements were tried to be fulfilled without interpreting the obtained information. Of the students who participated in the survey and whose final projects were assessed, 68 percent were found to attempt to create a spatial layout with the items and accessories they chose from various visuals, without thinking about the user–space relationship. It was observed that the selection of various accessories suitable for the atmosphere of the environment, such as seats, coffee tables, and carpets, was transformed into a state of copying the entire space from time to time. It is not possible that the user–space and function–meaning requirements of a project designed is the same as the requirements of another project. The students took the Introduction to Design II course of the Interior Architecture Department and had just begun making designs recently. For the solution of this situation that was encountered in project courses during and prior to the period when the study was carried out, the students were asked to do studies on concept development. The aim in these studies was to have the students to be able to solve the design problem in a creative, authentic, and innovative way.

The venues where students are actively involved in spatial design education and learn by doing are design studios. Although the names of studio courses can vary in different universities, these studios begin with the Introduction to Design II courses in the Department of Interior Architecture at Kocaeli University. This course is completed in the later periods as Project 1, 2, 3, 4, 5 and Final Project. Each of the groups in the Introduction to Design II course were divided according to the class size within the scope of the study. They were asked to design the interior of a rough building, which was given in an existing land, in accordance with the profiles of the people they chose. That class with 67 people was divided into four groups. The students in each group developed the design together with the project manager during a semester in line with the problem assigned to them. At the end of the semester, they delivered their projects and went to the reviewers. A group was informed about concept development during the semester, and was asked to complete the design processes using this method. No intervention was administered to the managers and students of the other three groups.

Out of the 67 students observed during the semester and at the end of the semester, 61 people submitted their projects at the end of the semester. And 6 people did not submit due to absence from school. The relationship between the projects that were delivered at the end of the semester and the concepts that the students created based on user–space requirements were evaluated in terms of form–meaning–function integrity. Moreover, a survey consisting of open-ended questions was administered to more accurately assess the students' design process. The survey consisted of four main sections. The questions in the first section included questions on the students' families that had affected their creativity, the environment where they had lived, and the education they had undergone. The questions in the second section were asked to learn whether the students had chosen their departments consciously. The questions in the third section were prepared to learn whether the students had hobbies that would improve their imagination, and whether they were participating in professional exhibitions, conferences, biennials, fairs and seminars. The questions that made up the fourth section of the survey were aimed at examining the students' design processes.

The first three sections of the survey were excluded from the scope of study, as they contained questions to get to know the students. This study included findings from the fourth section of the survey and student works. A total of 59 people participated in the survey. According to the results obtained from the survey, the number of students who began the design with a concept was 38, while the number of people who began without a concept was 19. Two students did not answer the questions (Figure 4).
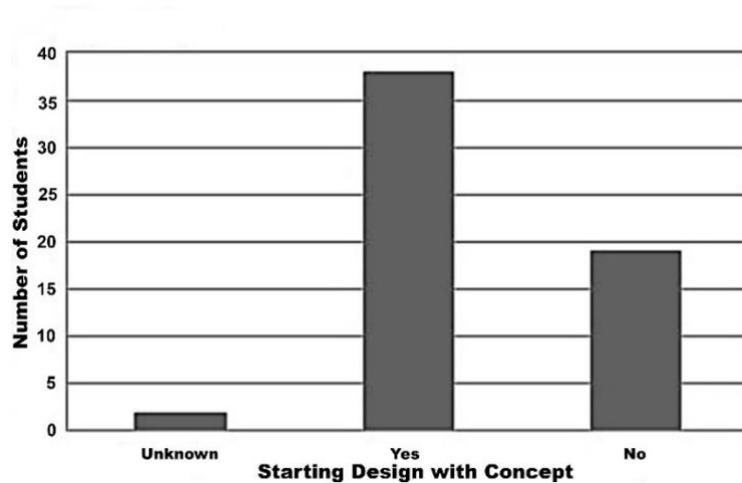
Figure 4. The Bar Chart That Shows Whether the Students Began the Design with a Concept

Of the students, 64 percent stated that they began the design with a concept. The rest of the students expressed that they used the methods that are presented in Figure 5. It is understood from the answers that the students did not have sufficient knowledge about concept development. This is because the slogan, user profile and functionality were used within the concept development. Ultimately, design knowledge is an action that can be created through concept development.
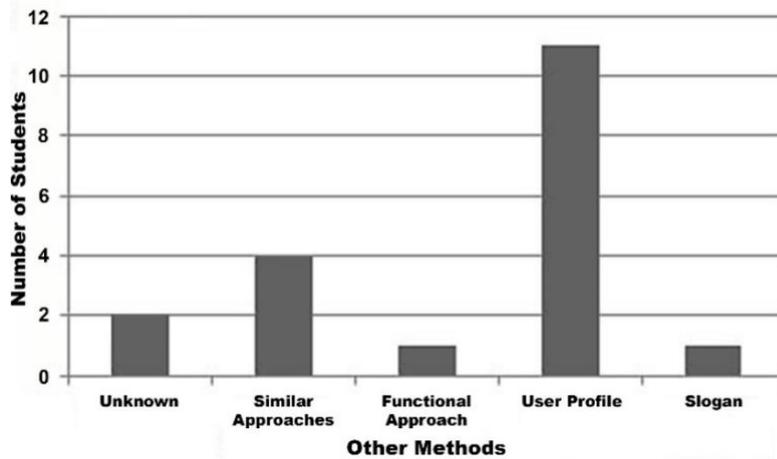
Figure 5. The Bar Chart That Shows the Methods the Students Used Outside of Concept Development

The results from the answers to the questions about evaluating the design process given by the students who claimed that they used the concept development method are as in Table 3. Of the students, 37 stated that the concept development method was the starting point and a guiding method by narrowing the options.

In addition, concept development helped design the relationships between the space layout, furniture, material selection, form and position. It provided convenience to their designs. In parallel to this conclusion, 34 of the students expressed that the method developed their creativity and pushed them into thinking and pushing the boundaries. They stated that they wanted to use this method in their subsequent projects (Table 3).

Table 3. Evaluation of the Method Done by the Students Using a Concept

	Unknown	Yes	No	Does not know
Begins the Design with a Concept, an Idea	2	38	19	-
Evaluates the Method as a Correct Process	-	36	-	2
Thinks that the Method Provides Simplicity in the Design Process	1	37	-	-
Thinks that the Method Improves Creativity	2	34	-	2
Intends to Use the Method in Subsequent Projects	3	34	-	1
Uses the Method Effectively	4	14	20	-
Did Research about the Method	3	17	18	-

Of the students, 20 stated that they could not effectively use the concept development method. It is also among the findings that the students who were unable to use the method effectively had not done research about the project. The 18 students who stated that they used the method had not done research about the method. It is likely that this number is greater. This is because the students who answered the question "yes" were found to confuse doing research about concept development with other research they did, which led to the possibility of increasing the "no" responses in Table 3.

Along with the answers given by the students to the questionnaire, the end of term design submissions were evaluated. The relationship between the concepts chosen by the students and the space designs they have created has been examined. Interviews were held with the students in order to evaluate the space designs put forward by the students in a qualified manner. Four groups were formed from the findings. An example from these four groups is discussed in Figure 6 and Figure 7. Students who were informed about concept development in the design process and whose concept-space design relationship was successful were included in the G1 group. In the G1 group in Figure 6, the student who chose the concept of "nature", examined the examples of the modern period in the design process. She expressed the concept of nature in an abstract geometric language. She continued this approach throughout the design. Students who do not have sufficient information about concept development in the design process and whose concept-space design relationship is unsuccessful are included in the G2 group. The student discussed in the G2 group in Figure 6 chose the concept of "minimalism". The student has not done qualified research during the design process. When the student's space design is examined, it is observed that he could not associate it with the concept. Students who were informed about concept development and failed in the design process were included in the G3 group. The student in the G3 group, who can be seen in Figure 7, chose the concept of "bohemian". In the survey, the student said that she did not start his design with the concept. However, when the student's studies and design in the process are examined, it is observed that she uses the method. Students who do not have sufficient knowledge about concept development in the design process and found successful are included in the G4 group. The student in the G4 group, which can be seen in Figure 7, chose the concept of "minimalism". It has been observed that the student constructs the user profile, the concept and design relationship she chose correctly.
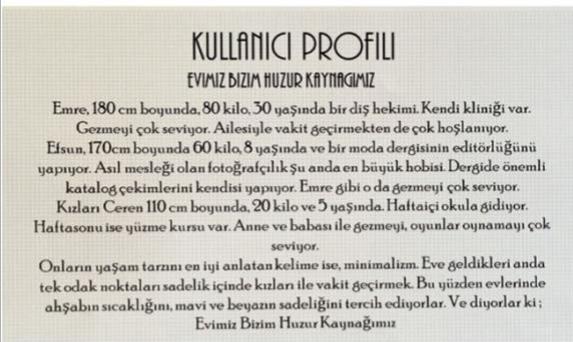
Concept	Having Sufficient Knowledge, Succeeded (G1)
"Nature is peace" The student mentioned in the concept sheet that the common aspects of users were the love of nature, and in this direction, chose the concept of "nature" as a starting point.	She chose to use geometric forms to emphasize nature. It is understood from the examples such as Mies van der Rohe and Frank Llyod Wright, which she put on her sheet, that she had embraced the modernist movement. The concepts put forward by the modernist movement such as geometric arrangements, rejection of decorations, wide openings made to integrate with nature, uses of glass materials and comfort in the interior space supported the student from beginning of the design to end.
Concept	Not Having Sufficient Knowledge, Failed (G2)
"Our home is our source of peace" The student mentioned that the concept of minimalism in the user profile reflects her users. She mentioned the physical characteristics and occupations of her users, but did not mention any content that may be associated with minimalism.	When her project was examined, it was clearer that the student's user profile and the concept that she chose were not associated with her design. The materials she used, her accessory selections, and plan layout have no integrity with the concept.

Figure 6. Examples of Students' Uses of Concepts

Concept	Having Sufficient Knowledge, Failed (G3)
"Bohemian" There was a student who mentioned in the survey that she did not use concept development even though she had sufficient knowledge. The student indicated that she did not use the method because she could not do abstraction and could not determine a single concept that reflects her user's characteristics. It is understood from the concept map that the student chose the bohemian concept as a starting point.	Moreover, the effects of the Bohemian movement were also visible in her project (ethnic material selections, comfort of the space, and so forth). It was decided that the student failed because she had sufficient knowledge about the concept development based on the education given during the semester and used the method even though she reported that she had not used the method.
Concept	**Not Having Sufficient Knowledge, Succeeded (G4)**
"My home is my inspiration" As in the case of G2, this student chose the concept of minimalism as a starting point.	However, in the user profile of this student, the relationship between the user and the concept is clearer and supportive of each other. She established a connection between her user's fashion design approach and the minimalist movement approach. When the student's project is examined, it can be seen that she more accurately contemplated how the user profile and the concept that she chose were related to her design than the other student.

Figure 7. Examples of Students' Uses of Concepts

When the students' survey responses and final projects were examined, it was found that the students of the groups other than those of the groups who were informed about concept development (G1, G3) did not have sufficient knowledge about concept development. The number of people who carried out concept development studies even though they did not have sufficient knowledge (in G2 and G4) was 44 (Figure 8). Six people from these groups were able to properly establish the relationship between the concepts that they formed and their designs in accordance with user and space requirements. The students who were informed about the method during the semester, who were directed to develop concepts, and who were successful in developing the concepts (G1) were observed to be able to improve their ability to think creatively, provide the form–meaning–function integrity in their designs and comfortably move forward in the design process.
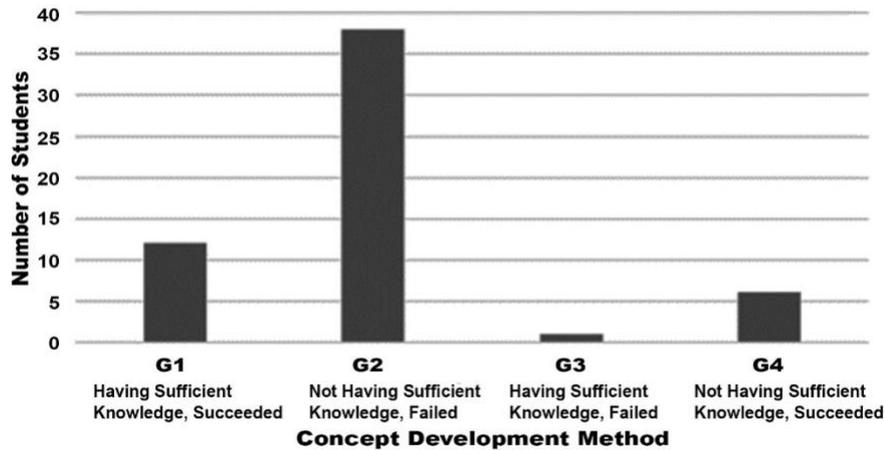
Figure 8. The Bar Chart That Shows Whether the Students Used the Concept Development Method

CONCLUSION

The education offered prior to university in our country, Turkey, is a form of education that corresponds to convergent thinking which asserts that there is only a single answer to a problem and in which only certain forms are accepted. However, creative thinking is a divergent form of thinking that is not satisfied with a single solution and seeks different ways of solution. The both ways of thinking are used in the design process. Imagination must be pushed and many options should be tried without any restrictions to produce creative ideas. The more options that one puts forward, the more one can approach new, original, and creative solutions. Ideas should then be evaluated by choosing the most suitable one from among them. At that point, convergent thinking takes effect.

Using methods that improve creativity in design education allows the student to gain different perspectives by enhancing his imagination and accumulation of knowledge. Concept and mind maps that are some of these methods guide students to think and do research. They enable the student to establish an analysis–synthesis–evaluation relationship between the findings and improve his intellectual and visual perceptional abilities.

In design studies, concept development is a method that includes concept and mind maps. Concept development becomes a starting point and a guide at the beginning of a design. This starting point is not only a start, but also a result as it creates a design language. As students convey their ideas visually by developing concepts, their ideas can be evaluated by them in terms of eligibility and innovativeness. Concept development is easy and understandable for the course instructor and the student as it allows to trace the student's design process. Because concepts organize space elements and items, they ensure the form–meaning–function relationship in the design. A well-thought-out conceptual study involving a strong content integrity will ensure that designs are authentic and innovative.

Before this study, it was observed in the upper and lower-grade project courses that the students had been choosing concepts without sufficient semantic depth and thought for their designs. The accuracy

of this observation was proved by this study. As a result of the evaluation of the studies carried out during the semester, interviews and the surveys, it was found that the students of the group other than those of the group who were informed about concept development were not sufficiently knowledgeable about this method. It was observed that they created concepts with concrete ideas that were not sufficiently thought out. On the other hand, it was found that the students who had adequate knowledge about concept development could think creatively and design original and innovative spaces. Therefore, this study was addressed in a way to ensure that the students put forward original and creative designs and to guide the students who had difficulties in moving forward within the design process.

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