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Evaluation of strategies of creativity development used in store design projects based on student projects

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Abstract

The aim of this research is to search and find strategies of creativity in teaching in the interior architecture design studio. There are lots of ways for training architects all over the world, instructors find their own way and style. Most design education, also architectural design, occurs through the studio system. Design studios embed project-based learning in most universities, and have been adapted as a teaching-learning strategy by the instructor in this study. Developing creative ideas has been a part of architecture design studios. Creativity is one of the basic constituents of innovation, and innovation is described as 'applied creativity in the field of design education'. Hargreaves (2000) suggests that "you can have creativity without innovation, but you cannot have innovation without creativity". The role of the instructors is to lead the students, understand and encourage them to create alternative design solutions. Meanwhile instructors show how to design and develop creativity in this process.

This article presents the methodology, processes, and outcomes of creativity strategies implemented during the process of producing alternative plans into a Store design project carried out as part of the Design Studio II class in a Turkish University. The strategies "Dead Head Deadline" and "Merged Ideas in a Box and Circle of Opportunity" are intended to expand students' perspectives, train them to propose solutions they would not have considered and, prevent them from fixating on a single idea. They also support them in creating freely. Feedback received from students after the implementation of these strategies is also presented in this research.

Keywords

design Studio, Architectural Education, Interior Architecture, Store Design, Creativity Strategies, Implementation Project

Introduction

Creativity is a matter of concern for every profession, for students of architecture it is particularly relevant. Architectural students need creativity both in the university and in business life. They should learn and experience creativity in projects developed in

university. It is therefore critical that techniques and strategies be taught to develop creativity skills in undergraduate architectural programmes. In the first section of the article, literature studies related to creativity in design studios is given. In the second section of the article, implementation studies and recommended strategies are given.

Creativity in the Design Studio

This article specifically focuses on creativity in design studios. Design studios are the general names of design-oriented courses in architecture education. This section contains a literature review of studies in this field. Denomination of creativity depends on the discipline; it is called 'innovation' in education, 'entrepreneurship' in business, 'problem solving' in mathematics, and 'performance' or 'composition' in music. Creative products of various fields are measured according to the norms of their field based on their own rules, approaches, and concepts of creativity (Reid and Petocz, 2004).

There are many reasons for students to improve their creativity. In recent years, the most developed countries have been switching from industrial economies to information economies. The principal aspect of an information economy is innovation or psychological and educational creativity. If a country wants to compete in global economy, the curriculum should be a revised to involve creativity and innovation (Costantino, Kellam, Cramond and Crowder, 2010).

Creativity in the design process occurs when an important event, often called ‘creative step’, emerges. Sometimes such an event can be grasped suddenly by the designer, but often occurs when the designer can identify the steps in the design process (Dorst and Cross, 2001). Dealing with design problems requires creativity other than knowledge and expertise. Creative thinking requires the perception of a problem or event from a new perspective outside of the usual. Designers use different kinds of principles, tools, and heuristics to improve their creativity (Casakin and Kreitler, 2005). How creativity can be assessed in individuals is also an important issue. In order to accurately demonstrate creativity, it is necessary to approach the concept of creativity in terms of creative person, creative process and creative product. It is seen that the first studies on the measurement of creativity were based on the 1950s and were based on the investigations of J. P. Guilford. Guildford (1981) identified creativity with four main factors that were put into practice to assess individual creativity. These four factors are elaboration (amount of detail in the responses), innovation (statistical uncommonness of the responses), fluency (quantity of appropriate responses), and flexibility (variety of categories of appropriate responses). These four factors are very important and often taken into account when assessing individual creativity in different areas of problem solving. For this reason, they are seen to have high relevance to the design field. Increasing creativity requires looking at events, behaviors, and objects differently, seeing behind the scenes, and requiring being open to diversity. Creativity is to see the piece (detail) within a whole and also to see the whole within the piece (Çelek, 2011).

The design studio is the most important, complicated and difficult experience students go through in current design education. In a design studio, students are asked to understand several new concepts and ideas as well as perform two tasks, namely to design and to learn how to design, simultaneously. Also, students should establish personal relationships with other students and learn new techniques and skills (Sachs, 1999). The process of critique and the design studio is not only a lesson but also social interaction between students and the instructor and among the students themselves. In a way, communication is a keyword in the definition of a design studio (Demirbas and Demirkan, 2003). Students create alternative design solutions in the design process. Students brainstorm with different ideas and suggestions to evaluate design proposals while taking into consideration critique of the instructor in this process (Lawson, 2006).

In higher education, instructors should understand their role is not to teach students to be historians or designers but to be learners. Effective learning appears to be the key not only to success in education but also in a fast-moving working environment. One reason design students have difficulty conceptualizing and theorizing is because they are uncomfortable with this learning style (Ashton, 2010). As istructors we are asking students to engage in a strategy of learning in which they are not skilled. The learning preferences of design students, as we might expect, are action-oriented and revolve around imagination and emotion. Most design students have been steeped in these approaches even before they arrive in higher education. However, the vital stages of assimilating and comprehending our actions require us to be logical and thoughtful. Kolb (1984) believes that a balance of all these aspects is desirable, but he recognizes that people from various disciplines will have different learning styles, indeed these will have been developed in the course of their education. A change is needed to long-established learning habits, students should be encouraged to develop new strategies so that they have a pool of appropriate strategies from which to select.

Design instructors are supposed to constantly develop their teaching strategies and pedagogy to emphasize successful approaches to designing and thinking in a problem solving (Travis, 2011). Even very talented students generally feel that they have no control over the design process and that they fear it. This teaches students how to design and constitutes one of the most difficult challenges for a design studio instructor (Ledewitz, 2014).

The ‘Design Studio’ process can be mysterious for first-year students. Indeed, what the instructor wants the students to do may not be very clear. However, the instructor cannot really explain the situation until the students start the process, which can only be understood from the inside. Therefore, the instructor cannot have a dialogue with the students until the student lays the foundation for the first response to the problem. Schön (1987) describes this process as reflection in action, and the design studio as telling and listening, and demonstrating and imitating. The instructor can organize activities with the students and the process depends on the instructor's ability to create a game environment. Although the literature on architecture education contains no information on how to create such an environment between the instructor and the students, lessons can be drawn from psychoanalytic experiences (Schön, 1987).

Instead of having a single language and a single understanding, the instructor should be able to objectively look at the different approaches of the student. It is necessary to prevent the possibility that the result is the design of the instructor and the designer is the copy of the instructor. For this reason, the instructor may want to try different approaches to the design during certain periods. In this context, the instructor should never compromise, encourage synthesis to seek students, seek different ideas and contrary possibilities. It must be the student who makes the choice and the decision (Şahinler, 2000).

Instructors should give reliable clues for students to look for better strategies or solutions, urging them to find better ideas rather than compelling them towards a certain idea. They should not destroy the design ideas students present at one swoop. The role of an instructor is to understand and consider the proposals of students, and to contribute to the development of their design ideas (Yürekli, 2007).

Due to the complexity of the design process, there are no precise and complicated formulas that combine forms, functions, contexts and available technologies. Adhering to a mentality dominated by principles, experiences and intuitions, most designers achieve design solutions heuristically, i.e., cognitively (Kowaltowski, Bianchi and Teixeira de Paiva, 2010). Designer creativity depends on the personality type. Intuition is at the core of designer creativity. Designers can choose to play games as they generate ideas and the resulting ideas may sometimes be ridiculous or funny (Durling, Cross and Johnson, 1996).

According to Eigbeona (2013) several authors like Stevens, (2002), Morrow, et al. (2004), Holloway, (2013) and Thompson, (2013) have all found the importance of creativity in the training of architects. The following strategies that may foster or stimulate creative thinking in teaching the architecture design studio:

> *(1) Restrictions – building codes, site conditions, costs, etc. (2) Brainstorming (3) Analogy/ies (4) Removing mental blocks (5) Tools - like CAD (6) Techniques - like drawing/drafting technique (7) Protocols of good practice (8) Structure - good structure of design problems (9) Cognitive - cognitive thinking (10) Philosophy - philosophy of design strategies (11) Research (12) Theories of Architecture (13) Synecticts (14) Morphological Charts (15) Criticism (16) Historical Drawing (17) Model making (18) Attribute Listing (19) Axiomatic design strategy (20) Bio-Mimeticry (21) Browsing (22) Precedents (23) Architectural Values (24) Charrettes (25) Component Detailing (26) Doodling (27) Testing activities (28) Exaggeration (29) Excursions (30) First Principle (31) Focus/Focus Groups (32) Mind Mapping (33) Other Peoples Viewpoints (34) TRIZ (35) Think Tank (36) Using Crazy Ideas (37) Using Experts (38) Visual Brainstorming (39) Visualizing a Goal, (40) Doing Sketches (41) Working with Dreams and Images (42) Repertoire learning (43) Computer screens (44) The Creative Pause (45) Outputs (46) Chanllenge (47) Alternatives (48) The Concept Fan (49) Concepts (50) Provocations/Setting Up Provocations (51) Movement (52) Phototyping (53) The Random Input (54) Sensitizing Techniques (55)*

> *Visualizing a Goal (56) And having a critical knowledge and application of structures, materials, colours, light, shadow, lines, planes, masses, space, etc., can result to creativity too (Asasoglu, A. 2010 et al).*

As seen, different strategies could be used for stimulating creativity in teaching design studios. This research sets out to investigate different strategies.

Implementation project

Scope of the Study

Two strategy studies were carried out as part of the Design Studio II course of the Interior Architecture and Environmental Design Department of the Faculty of Fine Arts at Istanbul Gelisim University in Turkey, in the spring term of 2017/2018 to examine the approaches to develop the creativity of Interior Architecture and Environmental Design undergraduate students in design studio classes and evaluate the contribution of proposed strategies in the process.

Firstly, information is given about methods to increase creativity. These studies were carried out individually in the pre-sketch phase and in a two-week period. The student group consisted of 13 people between the ages of 19 and 21. The average age was 19.46 and standard deviation was 0.66. There were three male and 10 female students in the group and participation was voluntary. The research design studio was held in the third and fourth weeks of the course. Participants were given information on the study, then signed consent for the study were obtained.

It is important to introduce creative approaches to inexperienced students in the design studio. Teaching students the principles of good design and how to develop creativity should be taught in this process. The role of the instructor in the studio environment (teaching, directing, showing, supporting, provoking, discussing) is vitally important (Yürekli, 2003). The role of the instructor is to act as a guide who supports the autonomy and initiative of students rather than being the sole source and transmitter of the theoretical knowledge. The obligations of the instructor can be explained as "selecting activities, putting students into activities, arranging problem situations, acting like a catalyst, and producing divergent solutions of students" (Bevevino, Dengel and Adams, 1999).

VanGundy (2004) was examined in terms of strategies that could be applied in design studios. It is known from previous experiences that students have difficulties while creating alternatives of general arrangement. It was observed that they were not creative when they were asked to produce ideas quickly, especially within a certain time limit. It was decided that the ‘Dead Head Deadline’ strategy would be suggested as a solution for this problem. Another problem identified by Van Grundy was that students became stuck in a single idea and had difficulty in producing alternatives. They were hesitant when they were

asked to sketch on paper, even though the ideas were ridiculous. This method was created to make students see the ideas they have in mind or the students never thought about. ‘Merged Ideas in a Box and Circle of Opportunity’ strategy was created by combining two strategies as a solution for this problem. Different ideas will be created with the “Ideas in a Box” method. And with the "Circle of Opportunity" method, they will leave the choice among these ideas to chance. Two strategies suitable to be implemented in this project sketch phase of the design studio were chosen. Each of these approaches are discussed with study results in the following two sections.

The "Dead Head Deadline" Strategy and Its Adaptation to the Design Studio

Midterm submission deadlines in design studio classes were determined and an attempt made to familiarize students with this process. The in-class process was also managed by setting deadlines for the course. People live in a world of deadlines and are constantly ordered to do things now, do yesterday, do soon, and simply, do. Instructors, must prepare students for this world. They must show them if a job is not done now, it will never be done. Having deadlines is oftern though of negatively, but does have positive aspects. Deadlines can be used to be more creative. These deadlines can give the motivation needed to boost creative productivity (VanGundy, 2004).

In this study, a store design project was carried out with students. The first two weeks consisted of observation, research, determining brand identity, and presentations. In the third week, the students were asked to design alternative layouts on the plan provided for them. However, it was observed that students could not come up with different ideas and were blocked. As explained in Section 1, they were afraid at the stage of producing ideas, their development hindered by the fear of making mistakes. It was explained to the students that there were no wrong ideas, and they should try creating. The instructors could not advance the process until the students initiated it. The necessity to turn this process into a game was also explained in the initial phase. Ching (2006) sees drawing as the most natural and even instinctual human need. He also argues that drawing is an instrument of vision and expression, making ideas visible and which acts as thoughts of visual imagination. He mentions that the act of drawing is a natural reaction every human can perform and does not require special talent. Therefore, in the first strategy "Dead Head Deadline" the students were asked to produce alternative layouts, logical or illogical, even ridiculous, racing against time. As instructors, every student struggled to sketch and be comfortable with expressing their ideas.

With this strategy the deadline and tasks must be realistic. A decision was made with students on how many sketches should be produced in how many minutes. The process was designed to be realistic, no longer than necessary, and productive. At this stage, the Pomodoro technique, which was invented by Italian student Francesco Cirillo in the 1980s and was still studied, was included in the strategy. In this technique, Cirillo set 25 minutes for work and a 5-minute break, based on the idea that the mind works more productively in shorter time intervals. The time limit was intended to maximized concentration on a single task to help the mind focus on a single matter with maximum efficiency. Brief breaks

after work function as rewards for achievement, and increase motivation (Cirillo, 2006). It was decided that students would use bubble diagrams for 25 minutes to quickly prepare 15 sketches of general layout plans. Denel (1979) defines creativity as proposing multiple solutions in a brief period. Based on this perspective, time was started, and it was seen how many sketches students prepared within 25 minutes. Then, the instructors and students examined the sketches and separated the ones that presented solutions. To facilitate the task a two-storied store plan was given to the as shown in Figure 1.

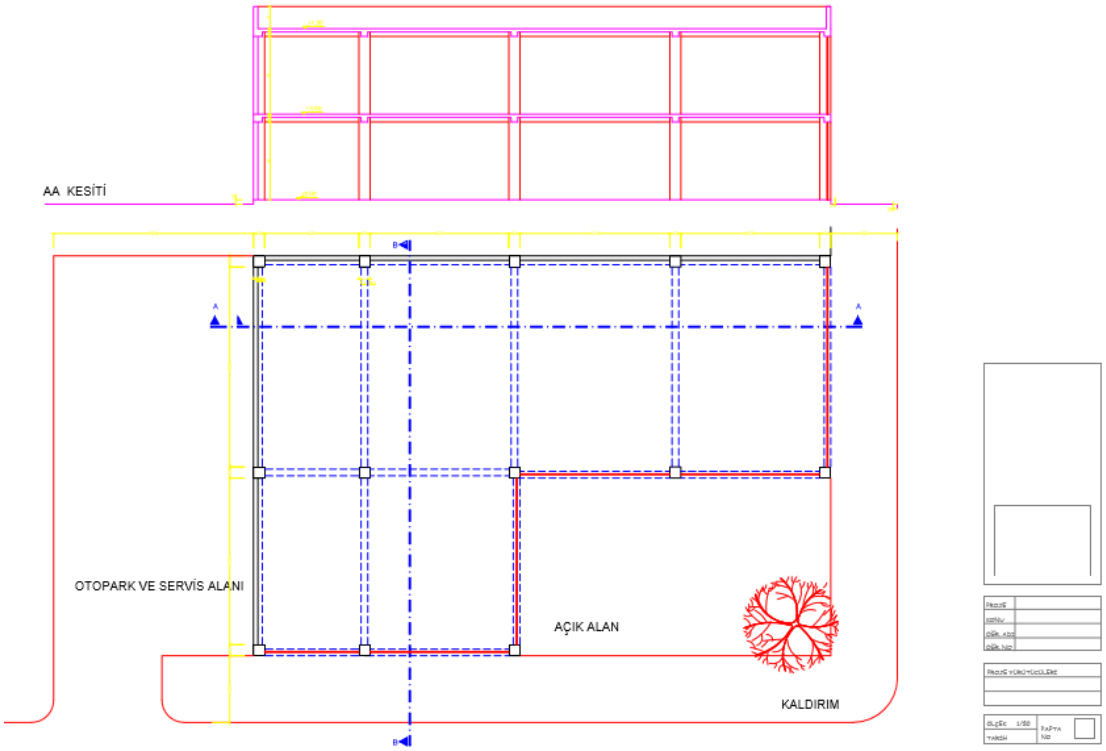


Figure 1. Design Studio Store Design Project Plan

Work from two selected students are presented in this article. Figure 2 shows the work of applied “Dead Head Deadline” for Student 1, who prepared 10 sketches in the time interval. Alternative layout plans created by applying ‘Dead Head Deadline” strategy by student 2, who prepared 16 sketches in the time interval, are presented in Figure 3.

With this strategy, students can see how many different ideas they can produce without separating right or wrong. Previously, students couldn’t decide what to do during the eight hours of course duration. But now, they saw how they could be efficient in a short time period. Deadlines are stressful situations in both work and student life. They saw deadlines has a positive contribution. So, they transformed the time constraint into a motivating and creative action.

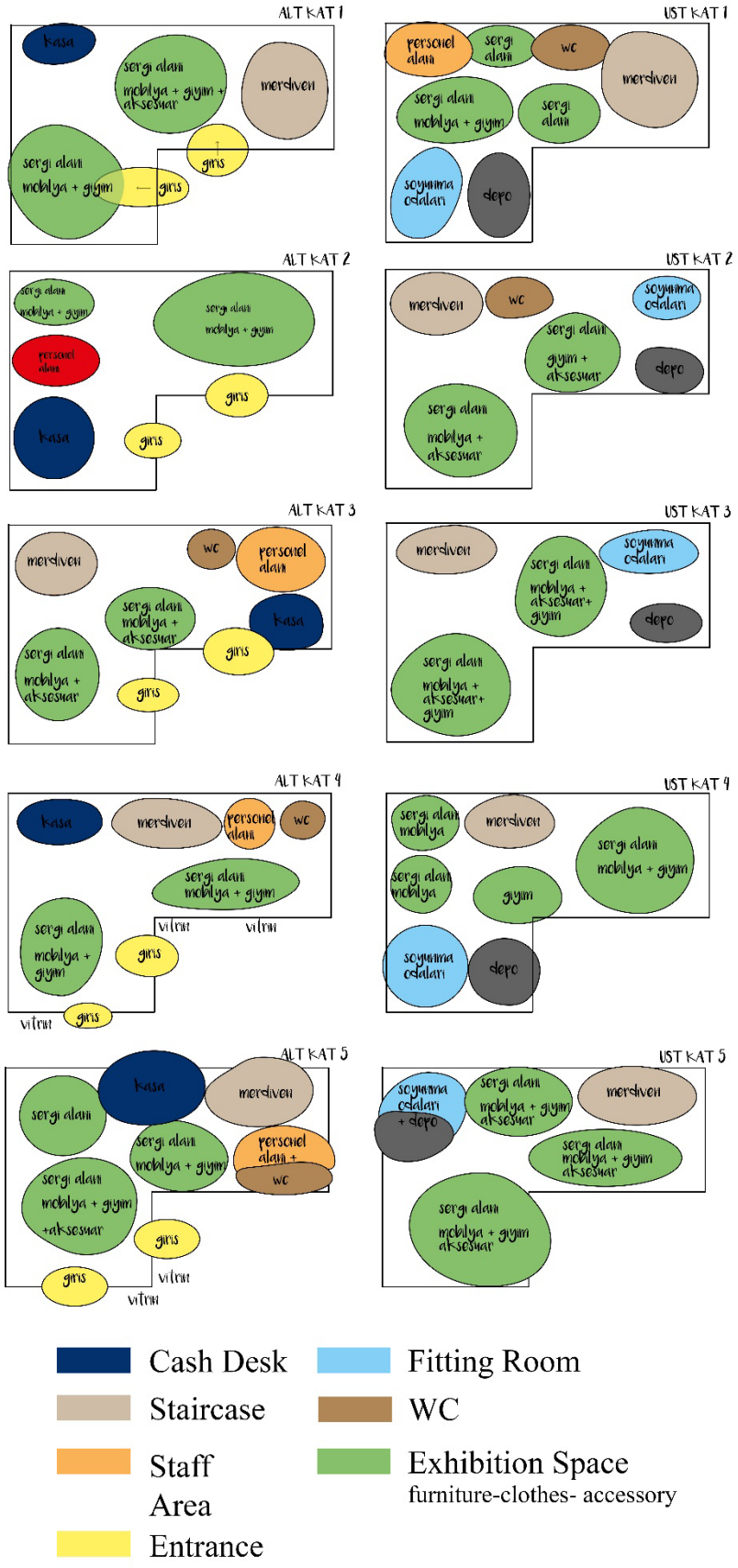


Figure 2. Student Sketches – Student 1

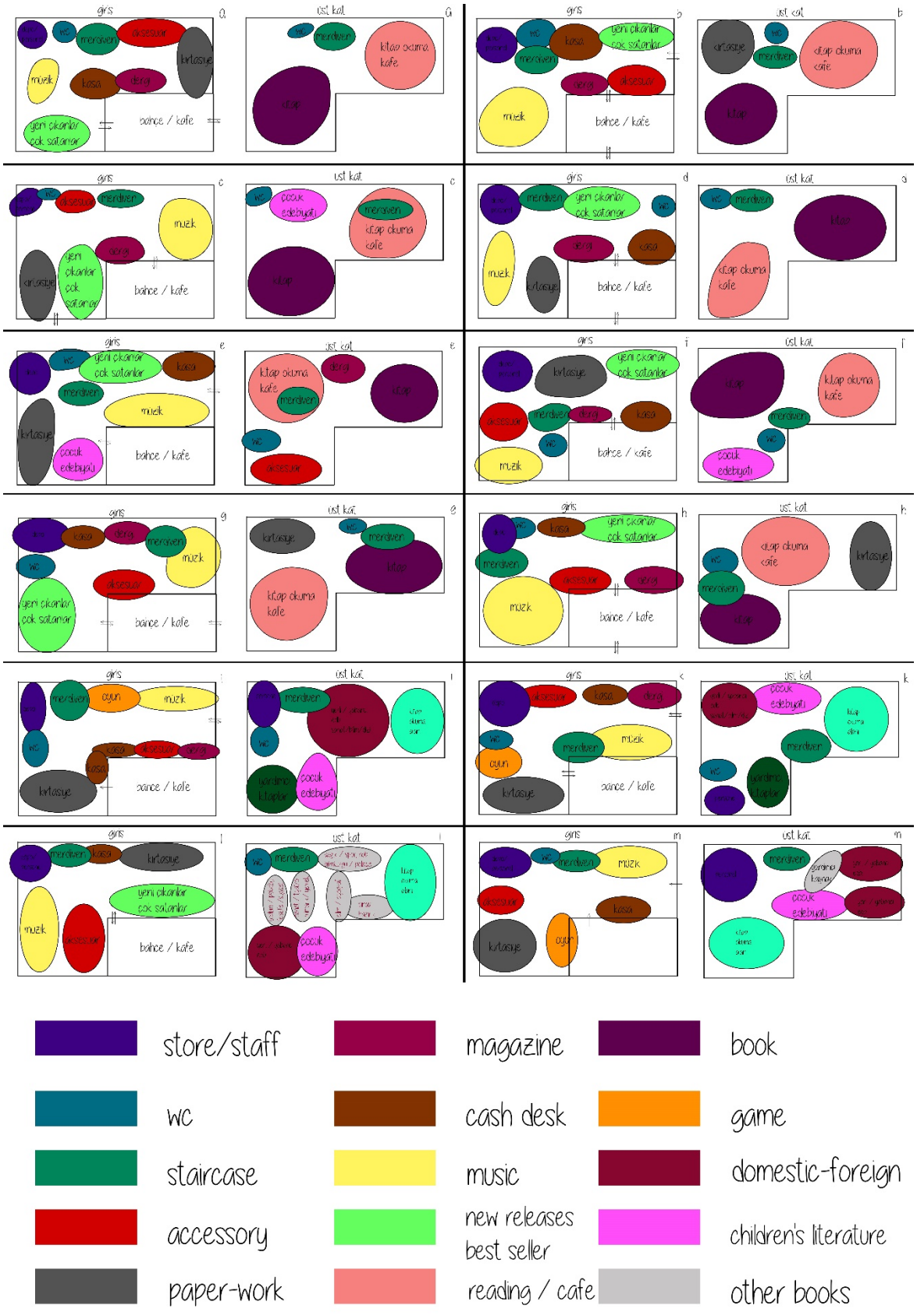
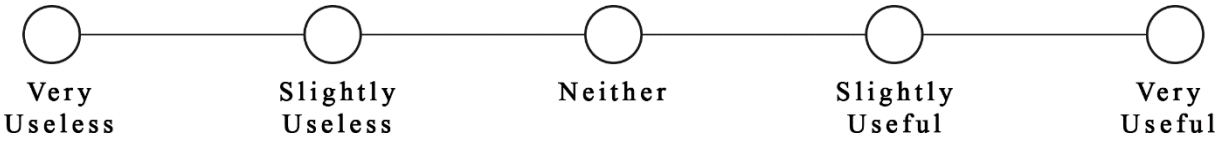


Figure 3. Student Sketches – student 2a. Evaluate the strategy in terms of creation of alternative layout plans.

A survey was conducted after the application and students evaluated the strategy. They were asked whether they considered the process to be beneficial and whether they would use this strategy later. A Likert scale was used in the questionnaire. The Likert scale is one of the most popular (and reliable) ways to measure someone's attitudes and behaviors. The Likert scale measures attitudes and behaviors by using varying response options from one end to the other (ie from the least likely to the most unlikely). Contrary to a simple "yes / no" question, the Likert scale allows you to expose ideas. This can be particularly useful for sensitive or challenging topics. For this reason, in addition to the evaluation questionnaire prepared by the five point Likert scale, also there are two open questions. The aim was to express the opinions of students with open questions. Results from both sets of data are presented in the next section.

a. Evaluate the strategy in terms of creation of alternative layout plans



Seven of the 13 participating students found the application very useful and six found it slightly useful; so, 53% found it very useful, and 47% found it useful.

b. Was the strategy challenging for you? Explain.

The aim was to create 15 sketches within 25 minutes. It is observed that 10 sketches were successful in this time interval. The limit, which was higher than necessary, yielded successful results as it challenged the students. Seven of the 13 participating students said it was not challenging, four said it was slightly challenging and two said it was challenging but the challenge was beneficial for them. Therefore, the strategy did not challenge 53% of the students, slightly challenged 31% of the students and challenged but was beneficial for 26% of the students. The students who were not challenged said the time limit helped them creating more ideas.

c. Would you use this strategy in your other projects?

When asked whether they would use the strategy in other projects, 10 said they would use it, two said they would use it and one said they would maybe use it. 77% of the students said they would use the strategy later, 15% said they would definitely use it and 8% said they would maybe use it.

According to Ching, there are two routes in drawing activities. The first, observation-based drawing, is to capture, understand and remember the moment. The second, imagination-based drawing, helps us communicate with what is in our minds, and this process is crucial for design. We can coordinate what we think and our hands only by drawing (Ching, 2006).

This strategy was implemented to pouring ideas quickly onto paper while establishing this coordination.

The "Merged Ideas in a Box and Circle of Opportunity" Strategy and Its Adaptation to the Design Studio

"Ideas in a Box", originally known as morphological analysis or matrix analysis, was developed by Fritz Zwicy in 1969 to help create scientific ideas. Like in other combined activities, it drives ideas by forcing the combination of problems that lead to new ideas (VanGundy, 2004). This exercise offers a relatively systematic way to consider different idea variations. On the other hand, it can be limited as it emphasizes seemingly unrelated matters. However, it is a fitting exercise for people who want to analyze situations. To carry out this exercise, it is necessary to categorize a problem into sub-problems and create alternatives for these sub-problems. The strategy is intended to help inspire new ideas by combining alternatives.

The strategy was applied to the store design project. The person inside the store space is in a position to feel the presence of the inhabitant in order to become a spectator. Through the atmosphere created in the store, the person perceives the bounded space. For this reason, the editing of the space is very important. Often a consumer's first impression of the store depends on the things that can be seen or felt from outside the store; showcase, the size of the store, the architectural structure. Depending on these factors, they may make a judgment. The store atmosphere is a broad concept that extends from outside to inside, ranging from product exhibition display regulations to lighting and decoration (Bayçu and Arslan, 2016). Within the scope of the design studio, all these items are referred to preliminary preparations. In this article, the process of creating general layout plans is mentioned.

After the rough design of general layout plans, they were categorized into subunits, for which layout alternatives were designed. The strategy was proposed because students had a difficult time creating alternatives and could not make progress. The students were asked to create many layout alternatives; however, it was observed that they were fixated on one or two alternatives. It is necessary to show students that alternatives they did not consider could work, and it is intended to find creative alternatives by turning the process into game. As instructors, our task is to encourage them to create multiple ideas.

It was necessary to categorize a problem into sub-problems to use this strategy. This stage was carried out by brainstorming with all the students. Based on the importance of creativity, initially Osborn (1957) proposed "brain storm" strategy. Brainstorming in general a probable strategy that accommodates many possible solutions (Sutton and Hargadon, 1996). Brainstorming is a strategy of developing thinking skills and creativity in individuals. This strategy also improves the ability to solve problems in individuals and to produce solutions to the problems faced. Individuals develop skills during training and learning periods, not only by themselves, but in group work by producing ideas and

listening to the opinions of the group members and building from these ideas (Rawlinson and Broudy, 1976). According to Osborn, the quality and quantity of the ideas produced can be enhanced by the brainstorming technique. The quality of ideas increase as well, however participant should refrain from criticising individual thoughts. Diehl and Stroebe (1987) found a high relationship between the number of thoughts and the originalality of thoughts. The important thing is to produce many thoughts thus increasing the likelihood that an original idea will emerge.

In this study the main ideas affecting the store layout plan was determined as presented in Figure 5 as they, with subheadings, were written on a workshop board. These were the formal layout plan, the stairs, accessories/elements and the impact on design. For the formal layout plan, grid plan and open plan Berman-Evans classification, were chosen. Store plan diagrams are categorized into five types: the straight plan, the pathway plan, the diagonal plan, the curved plan and the geometric plan (Özdemir, 2014). Considering these two classifications and according to the layout plans of the examples examined at the design studio, the layout plan was divided into subheadings like the grid system, the curvilinear system, diagonal, geometric form and mixed system, as shown in Figure 4.

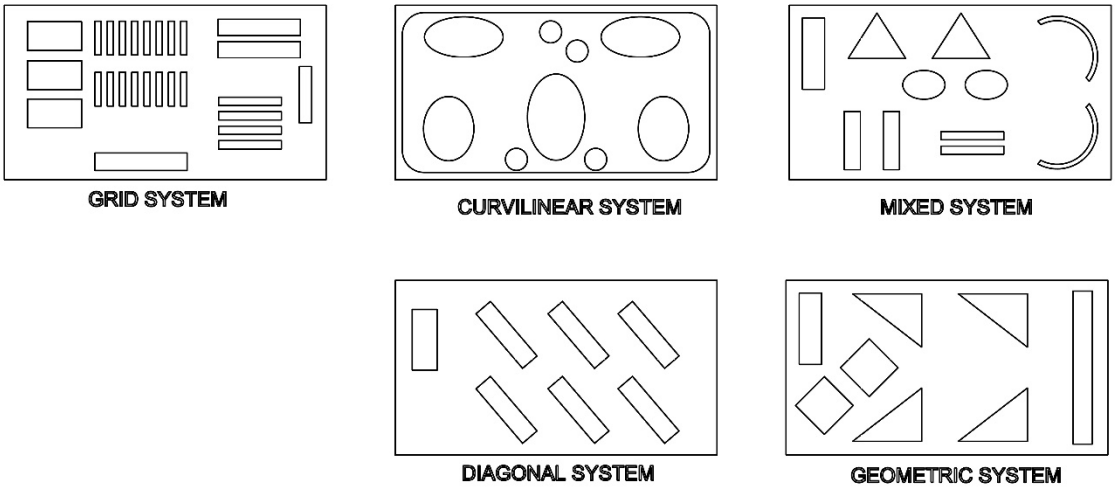


Figure 4. Layout Plan Subheadings

The grid plan has a solid layout, which we can also call the grid layout; the size, shape, length of the corridors and width of the display areas show a homogeneous distribution throughout the entire store. This arrangement allows the customer to access the back side of the store. Compared to other types of in-store placement schemes, it is the most efficient in using store space. Clear and evident corridors facilitate shopping. It creates a clean and tidy store atmosphere. It allows customers to choose the products themselves. It also facilitates stocking, labeling, cleaning-maintenance operations (Lewison, 1997).

The free plan allows for a lower systematization but a different use of equipment according to the grid layout. It allows creative visual presentations, encourages unplanned shopping as it facilitates instant purchase and passage between departments. Also, they

have a flexible layout, the stores can enlarge, reduce, or change the parts they want without distorting the overall internal layout (Levy and Weitz, 2001).

Also shown in Figure 4, construction of the curvilinear system plan type is more difficult and economically more costly than other plan schemes. The curves are emphasized by shaped walls, ceiling and corner points. In such spaces, suitable equipment is used for the curves of the space in circular form.

There is an angular pedestrian flow originating from the diagonal system sequence. The angled arrangement provides an interesting environment design. This can wake up the feeling of excitement when visiting the space. The geometric form system has a schematic diagram that is shaped by geometric forms with showcases, shelves, and angled walls elements. Within the space, the customer provides a different environment (Barr, 2003).

Mixed system is formed by using plan types together. Another floor can be created by using a different plan type while a certain floor type is used with a plan type, and it can also be created by applying different plan types in different sections within the same floor.

The staircase main heading was divided into the subheadings of straight, turning left, turning right, two-handed and spiral staircase types. The accessories and elements of the store were divided into subheadings like entrance, showcase, register, changing rooms, stairs, ceiling, floor, walls, and exhibition elements. Interior impact to be emphasized was chosen to be chaotic, natural, luxury, calm, peaceful, light and intimate based on the brainstorm.

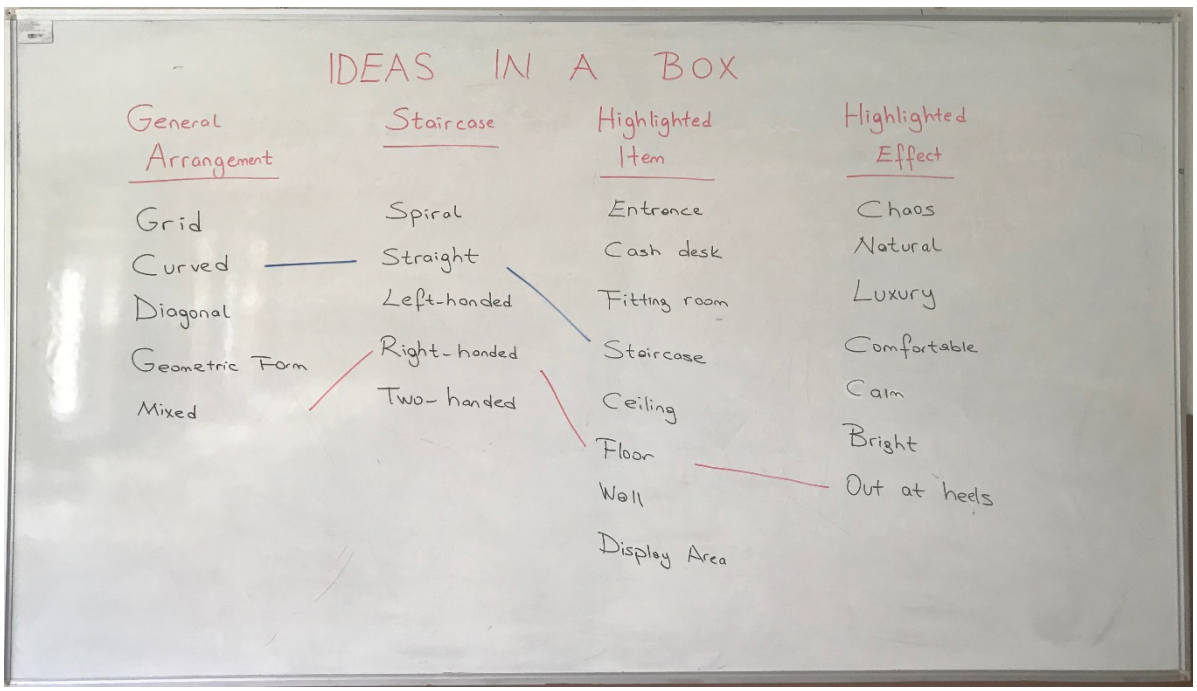


Figure 5. Implementation of the "Ideas in a box" strategy at the workshop

The students were asked to write the subheadings on the forms provided for them. There was a debate on which alternatives should be matched to generate an alternative layout plan. At this stage, it was observed that the students were inclined to choose the items that fitted the plan in their imagination. The "Circle of Opportunity" strategy was integrated to support the students' imagination by helping them created alternatives they did not want or consider. The "Circle of Opportunity" strategy was likened to gambling. All creative activities are described as gambling in this strategy. It is known that we use our time, efforts and creative skills in a process that we cannot foresee, and for all our efforts, we can sometimes make things worse. All types of gambling include an element of chance, which leads to interesting things. Chance determines whether we win or lose, and we can utilize it even if we cannot control coincidences. For instance, we can use the random to help advance ideas. Random combinations of the characteristics of a problem can evoke new ideas (VanGundy, 2004). Therefore, the combinations of alternatives were turned into gambling to transform the process into a game, in which students had fun and control over the process was completely randomized. The two main headings were tested at the first stage. Subheadings of the formal layout plan and the stairs were written on paper in two groups. Items were drawn from the first and second main headings, and the students were asked to match the results on paper. At the second stage, they could choose from a main and subheadings themselves and were asked to created alternatives with as many draws as they want.

The students were interviewed one by one and selected from the function charts they created with the help of the “Dead Head Deadline” strategy in the previous week. The second strategy mentioned in this section, “Merged Ideas in a Box and Circle of Opportunity” strategy, was introduced to create layout alternatives based on selected function diagrams. A one hour period is given for each of the settlement plans to reflect the path implemented by using this strategy. The alternative samples emerged at the end of the period are shared below.

Evaluation of the Sketches

Sketch examples based on the draws from two main headings belong to Student 1, Student 3 and Student 4 are presented below. Figure 6 shows that Student 3 created a mixed layout plan with a spiral staircase, and a grid system layout plan with a straight staircase.

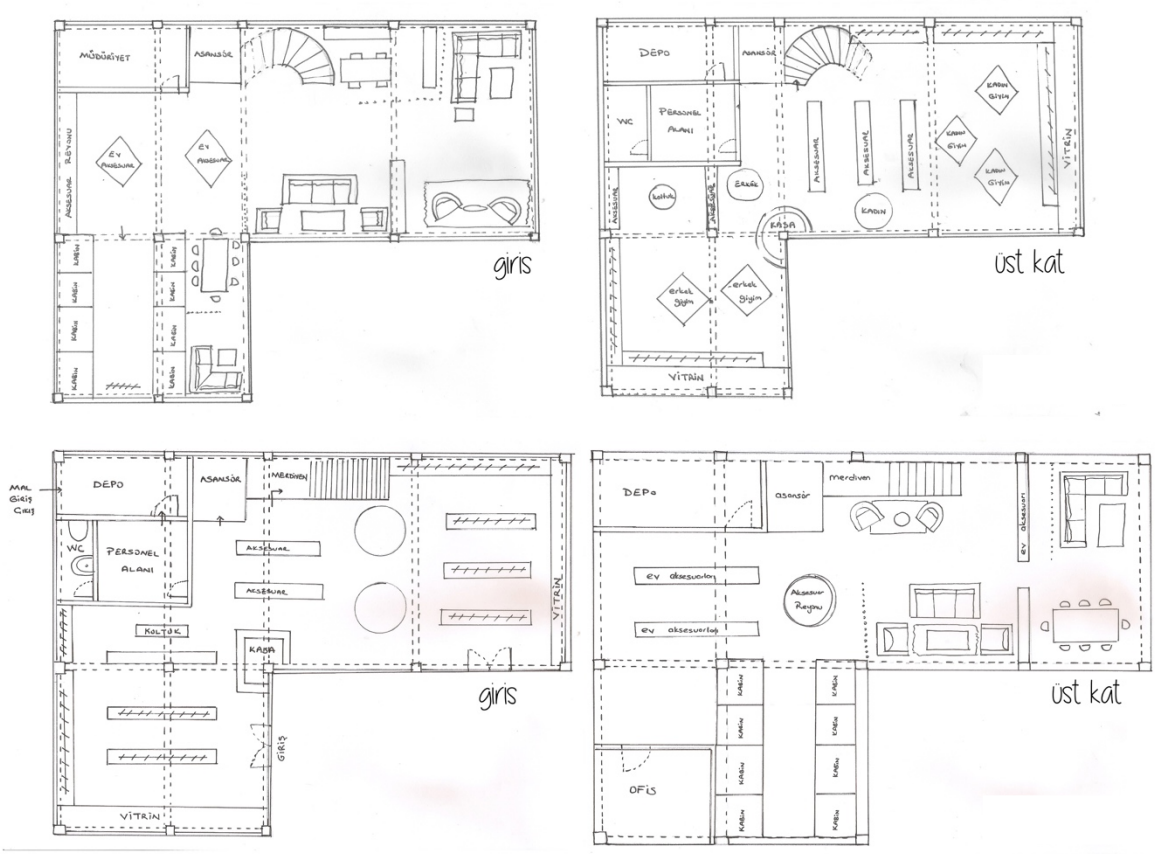


Figure 6. Student Sketches -Student 3

Figure 7 shows Student 1 based her alternative on a mixed layout plan and a two-hand staircase.

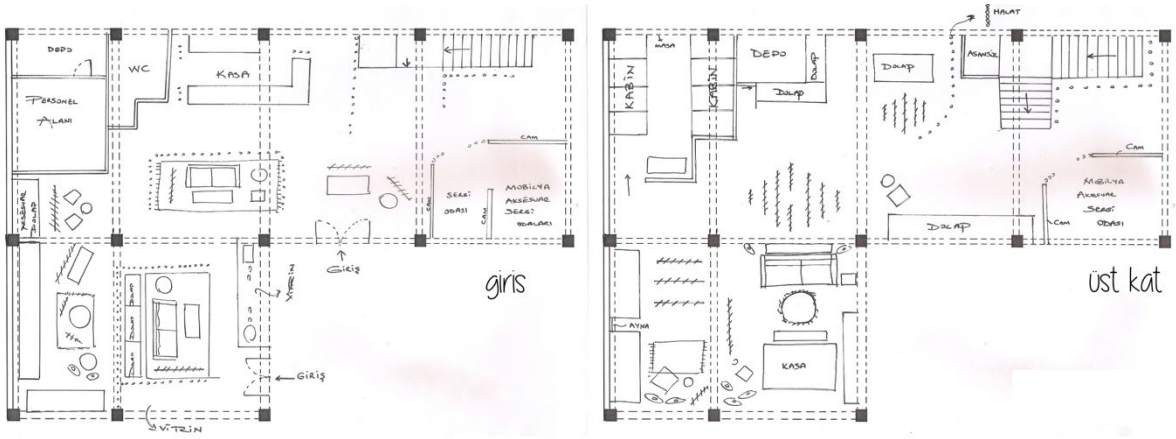


Figure 7. Student Sketches 2- Student 1

The layout plan in Figure 8 was created by Student 4 who based her choices on the four main headings: a grid system with a staircase turning right, and the ceiling as the emphasized element and the impact of peace.

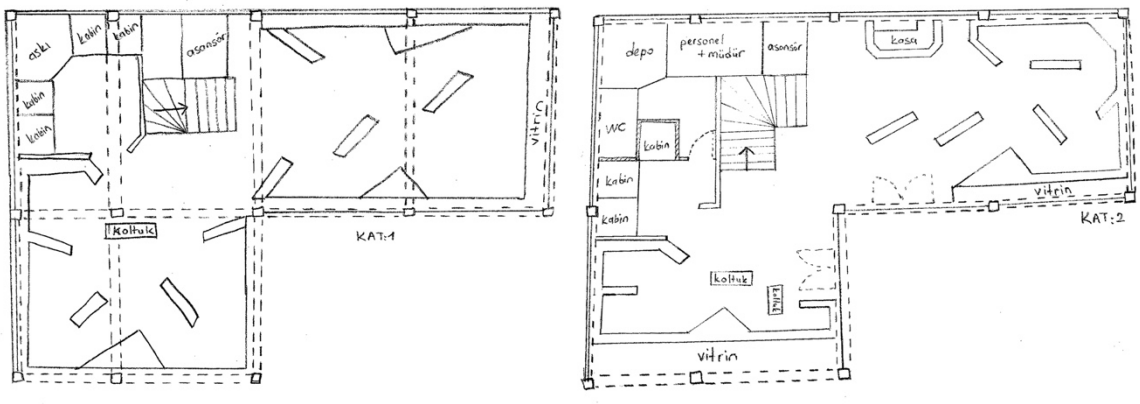
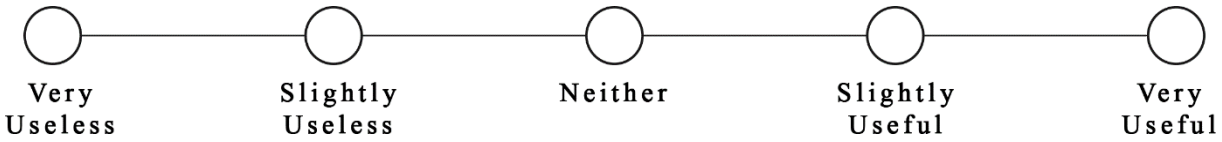


Figure 8. Student Sketches 2- Student 4

Student Evaluation of the Strategy

A survey was conducted after the application, and the 10 participating students evaluated the strategy. They were asked whether they considered the process to be beneficial and whether they will use this strategy later. As in the "Dead Head Deadline" strategy, the evaluation questionnaire includes an evaluation question prepared with a five point Likert scale, as well as two open questions. The aim was to express the opinions of students with open questions.

a. Evaluate the strategy in creation of alternative layout plans.



Four of the 10 participating students found the application very useful, five found it slightly useful, and one was neither; so, 50% found it very useful, 40% found it slightly useful, and 10% was neither.

b. Was the strategy challenging for you? Explain.

Among the 10 participant students, three said the strategy was challenging but beneficial for them, two said it was slightly challenging and five said it was not challenging. So, 50% of the students were not challenged, 20% was slightly challenged and 30% was challenged but finding the strategy beneficial. The comment of one student exemplified how the strategy achieved its goal: "Even thought the strategy challenged me in the beginning, it showed me a lot about what I should do. I used ideas I never considered thanks to this strategy and achieved positive results."

c. Would you use this strategy in your other projects?

When asked whether they would use the strategy in other projects, one said they would definitely use it and nine said they would use it. 90% of the students said they would use the strategy later, 10% said they would definitely use it.

Conclusion

Design studios in interior architecture are carried out by feedback or critique between the instructor and the student. The instructor explains the subject to the students, and either presents them with a prepared plan or asks the students to find a plan they would want to study. Function diagrams are formed by means of observation, research, making intervies, determing the needs and presenting the current situations. Students attempt to create alternative plans and ideas based on the selected funcition diagram. During this process, the project is built on the ongoing critique between the students and the instructor. Students should attempt to determine their own priorities and critique themselves rather than develop a project to meet the instructor's wishes. Therefore, students need to be creative throughout the process. Some projects can be rendered completely functional, produced and applied; however, projects lacking in creativity would have a hard time gaining recognition and influence in the sector. Creativity must be developed and supported, especially in students. Various strategies are recommended to help students improved their creativity in design studios.

In this study, potential contributions of creativity development strategies for students in design studio classes were evaluated. "Dead Head Deadline" and "Merged Ideas in a Box and Circle of Opportunity" strategies were applied in the book titled "101 Activities for Teaching Creativity and Problem Solving" written by Vangundy (2004). Students are asked to create function diagrams in the third week of their project. In the fourth week, they formed general arrangement plans based on the selected alternatives from the proposed function diagrams. It is observed that they have difficulty in developing creative solutions by thinking for a long time while creating functional diagrams and layout plan alternatives. With these two proposed strategies, they have been able to create solutions quickly, and have seen that alternatives that are not in their minds can offer solutions before they get stuck in a single idea.

After the exercises, the progress students made with the strategies were examined and the students were asked to give feedback Through the use of the strategies, various stimuli were included in the process, aiming to help Design Studio II students who were inexperienced and struggling to emerge strong and creative with their store design ideas. Based on the study, implementation of various strategies to boost student creativity during the process of creating layout alternatives is seen as beneficial. Student feedback confirmed this. In design studios, students are encouraged to improve creative thinking in their education, and these strategies give students a structure that can be maintained in their professional lives. Most of the students reached the conclusion that the strategies were useful in terms of creativity, researching in different subjects and gaining versatile

thinking skills. Most of the students stated that they also thought they would use the strategies in future studies. Therefore it would seem to be advantageous for instructors to exert efforts to study and test various strategies to improve student creativity. This article explores two specific strategies, contributions of other strategies in this process can be analyzed in further studies.

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References

Asasoglu, A., Besgen Gencosmanoglu, A., Kuloglu N., (2009). Designtrain Book: Training Tools for Developing Design Education. ISBN: 978-975-6983-54-6, Vizyon Printing Center, Trabzon, Turkey.

Ashton, P., (2010). Learning Theory Through Practice: Encouraging Appropriate Learning. Design Management Journal 9(2), 64-68. doi:https://doi.org/10.1111/j.1948-7169.1998.tb00208.x

Barr, V., (2003). Building type basics, Retail and mixed-used facilities, John Wiley & Sons, New York

Bayazıt, N., (1994). Introduction to Design Methods in Industrial Design and Architecture. Literatür Publishing, İstanbul, Türkiye.

Bayçu, S., & Arslan, F. M., (2016). Store Atmosphere. Anadolu University Publishing, Eskisehir, Turkey.

Bevevino, M. M., Dengel, J., Adams, K., (1999). “Costructivist Theory in the Classroom: Internalizing Concepts Through Inquiry Learning” The Clearing House, 72 (5),275-278.

Casakin, H. P., & Kreitler, S. (2005). The determinants of creativity: Flexibility in design. In P. Rodgers, L. Brodhurst, & D. Hepburn (Eds.), Proceedings of the 3rd Engineering & Product Design Education International Conference (pp. 303-307). London: Taylor & Francis.

Ching, F.D.K., (2006). A Creative Process in Architecture and Art: Drawing. YEM Publishing, İstanbul, Turkey.

Cirillo, F., (2006). The Pomodoro Technique.: Creative Commons Attribution- Noncommercial- No Derivative Works, California, USA

Costantino, T., Kellam, N., Cramond, B., Crowder, I., (2010). An Interdisciplinary Design Studio: How Can Art and Engineering Collaborate to Increase Students' Creativity? Art Education. Taylor & Francis Ltd.

Çelek, T., (2011). Creativity and Dimension in Education System. Retrieved from: http://www.universite-toplum.org/text.php3?id=47.

Demirbas, 0.0 & Demirkan, H., (2003). Focus on architectural design process through learning styles. Design Studies 24(5), 437-456. Retrieved from: http://hdl.handle.net/11693/11302

Denel, B., (1979). A Method for Basic Design. METU Faculty of Architecture, Ankara, Turkey.

Diehl, M., & ve Stroebe, W., (1987). "Productivity Loss in Brainstorming Groups: Toward the Solution of a Riddle". Journal of Personality and Social Psychology 53 (3): 497-509.

Dorst, K., & Cross, N., (2001). Creativity in The Design Process: Co-Evolution of Problem–Solution, Design Studies, 22(5), 425-437, ISSN 0142-694X, doi: https://doi.org/10.1016/S0142-694X(01)00009-6).

Durling, D., Cross, N., & Johnson, J., (1996). Personality and learning preferences of students in design and design-related disciplines. IDATER 1996 Conference, Loughborough University, Loughborough.

Eigbeonan, A. B., (2013). Creativity Methods In Teaching The Arch-Design Studio. Journal of Architecture and Built Environment 40(1), 1-10. doi: 10.9744/dimensi.40.1.1-10.

Guilford, J. P., (1981). Potentiality for creativity. In J. C. Gowan, J. Khatena, & E. P. Torance (Eds.), Creativity: Its educational implications (2nd ed., pp. 1-5). Dubuque, IA: Kendall Hunt.)

Hargreaves, D. (2000), Towards Education for Innovation, Qualifications and Curriculum Authority (QCA), 22nd November 2000, London, UK, 2.

Holloway, L., (2013). Eco Design – It's Not Just About Being Green. Newcastle Institute for Research on Sustainability.

Kolb, D., (1984). An Experiential Learning: Experience as the Source of Learning and Development Prentice Hall, Englewood Cliffs, NJ.

Kowaltowski, D., Bianchi, G., & Teixeira de Paiva, V., (2010). Methods That May Stimulate Creativity and Their Use in Architectural Design Education. International Journal of Technology and Design Education 20(4), 453-476. doi: 10.1007/s10798-009-9102-z.

Lawson, B. (2006). How Designers Think: The Design Process Demystified (4th ed.). Architectural Press, Burlington, UK.

Ledewitz, S., (2014) Models of Design in Studio Teaching, Journal of Architectural Education, 38:2, 2-8, doi: 10.1080/10464883.1985.10758354.

Levy, M., & Weitz, B. A., (2001). Retailing Management (4th Ed.), International Edition, New York: McGrawHill, Irwin.

Lewison, D. M., (1997). Retailing (6th Ed.), Upper Saddle River, New Jersey: Prentice Hall.

Morrow, R., Parnell, R. and Torrington, J., (2004) Reality versus Creativity? CEBE Transactions, 1(2), 91-99(9).

Osborn, Alex Faickney (1957). Applied imagination. New York: Scribner

Özdemir, S., (2014) A Model Proposal for Designing a Shop Using Shape Grammar. MSc Thesis, Istanbul Technical University Graduate School of Natural and Applied Sciences, Turkey.

Rawlinson, J.G.& Broudy, H., (1976). The Arts Human Development and Education. Eisner. Elliot Company. Berkeley.

Reid, A., & Petocz, P., (2004). Learning Domains and The Process of Creativity. The Australian Educational Researcher, 31(2), 45–62.

Sachs, A., (1999). 'Stuckness' in The Design Studio. Architecture Publications and Other Works. Retrieved from: http://trace.tennessee.edu/utk_architecpubs/4.

Schön, D. A., (1989). Educating the Reflective Practitioner. San Francisco: Jossey-Bass Publishers. doi: https://doi.org/10.1002/chp.4750090207.

Stevens, G. (2002). The Favored Circle. The Social Foundations of Architectural Distinction. MIT Press. USA.

Sutton, Robert I. & Hargadon, Andrew (1996). "Brainstorming Groups in Context: Effectivenes in a Product Design Firm". Administrative Science Quarterly 41: 685-718.

Şahinler, O., (2000), Architectural Education, Design / Implementation of Academician Seniors and Others, Building Magazine, 222, Pages 22-23, İstanbul.

Thompson, I. H. (2013). Landscape and Utopias, SAPL Research Seminar, Newcastle University, UK. 8th February.

Travis, S. (2011). Conceptual Thinking: The Design Concept in Interior Design Education. Design Principles & Practice: An International Journal, 5(6), 679-694. doi: https://doi.org/10.18848/1833-1874/CGP/v05i06/38236.

Vangundy, A. B., (2004). 101 Activities for Teaching Creativity and Problem Solving. John Wiley & Sons Inc, New York, United States.

Yürekli, H., (2007). The Design Studio: A Black Hole. Arch. Design Education. Views, YEM Publishing, İstanbul, Turkey.

Yürekli, İ., (2003), Game in Architectural Design Education, PhD Thesis, Istanbul Technical University Graduate School of Natural and Applied Sciences, Turkey.