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The Effect of Studios on Learning in Design Education

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Abstract

The present study that aimed to determine the effects of the project classes conducted in the design studio on students was scrutinized specifically on the studio work conducted within the context of Environmental Design Project Course studio practice in Karadeniz Technical University Landscape Architecture Department. The study was a studio practice. In the first phase of the study, the content and practice of the studio course was examined. In the next phase, a survey was conducted with 174 students to investigate the effects of the fact that the courses were conducted in the studio environment on design students. The survey aimed to inquire the effects of the studio on the students' creativity, development and learning of design skills. The satisfaction of the students in this course and their views about the use of the process in their future professional life was studied. Survey questions were asked to freshmen, sophomore, junior and senior students and the differences between these classes were determined. The questions were assessed using a 5-point Likert attitude scale. Conducted statistical analyses (SPSS 23.0) demonstrated that students considered the studios as environments that improve their creativity the most, students at all levels were satisfied with the studios, but that their satisfaction increased with their seniority, and they wanted to utilize this process in their professional lives and this desire was most prevalent among senior students. Correlation analysis findings demonstrated that satisfaction with the process was mostly related to the learning process. The present study findings demonstrated that design studios were instruction environments that provide students with design skills, improve their creativity and provide them practice opportunities. Study findings also revealed that the students were satisfied with design courses instructed in the studio and desired to experience the same process in their professional lives as well.

Keywords: Design education, Design studios, Landscape architecture, Learning.

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Introduction

In order to discuss the nature of design education, it is first necessary to define the concept and the act of design. The form of education can be determined based on the nature of education. Design is an attempt to obtain a previously non-existent object by associating things with each other (Yılmaz et al. 2016; Düzenli et al. 2017a; Düzenli et al. 2017b). As a result of this endeavor, an object that did not exist before is the design is obtained (Öztürk 2007, 2010, 2011). Design is a holistic process that cannot be broken down into steps or stages and could be defined as identification of a problem and the consequent act of problem solving (Uluoglu 1990; Yılmaz et al. 2018). Design theoreticians Rittel, Webber and Schön, who were the pioneers of the second generation and whose impact is visible even today, emphasized that the design process includes an "adventurous process" rather than a linear process, focusing on the "exploration of the problem" rather than a solution of a given problem (Rittel and Webber 1973; Schön, 1985). This risky process, where new possibilities are searched due to setbacks and repetitions, is also a belief system that demands loyalty and patience and an act of producing ideas that center on the individual and individual's needs. It is very difficult to limit design, which is by definition an act of associating objects, in a framework of experienced truths that are transferred from one individual to another in the educational system (Gür 2003; Dikmen 2011). The transfer of knowledge based on these experiences is an approach necessary in design education. The reflection of this approach in design education is the master - apprentice relationship. Creativity training is a process that develops with new knowledge and skills with no clear boundaries (Hetland 2013; Yılmaz et al.2017).

The position and education of design in the society have been discussed since Vitruvius, who wrote the first manuscript on the topic. Vitruvius, Villard de Honnecourt and Leone Battista Alberti were the first authors who were interested in the subject. They all had different views; Alberti argued that the artist should not be trained in a studio, it would be sufficient for the artist to have theoretical knowledge on several arts and art should be based on reason in a universe where mathematics prevails, while several Renaissance architects, contrary to Alberti, were trained as laborers at art studios. After the academies were established in the 16th century, the theoretical education became prevalent in the West (Kuban, 1984). Education has progressed in various directions since the establishment of the academies. However, to consider architectural education as an activity that needs to be discussed and investigated, not only as an activity of performance, one had to wait until it was realized that design required knowledge, theory and methodology. Historical development of design is basically divided into three periods. The first is the period when schools of architecture were not available and the education was provided within the guild system. In the second period, theoretical education was given at schools of architecture. The French Royal Academy and Ecole des Beaux Arts are the examples of this period. In the third period, the practice was integrated into the school and the studios were included in the architectural education. This period could be exemplified with the Bauhaus and post-Bauhaus era. While the educational approach and principles in Turkey are quite different, it is possible to find several similarities. The common characteristic among all approaches that did not differ among the site/guild, the school or the studio approaches is the the master-apprentice relationship, which has been the basic educational method. In Turkey, it could be argued that the transfer of design education into the studios occurred later than the examples elsewhere in the world.

Gathering information and learning by practice enable the student to cope with even the most complex, contradictory and unusual situations. In all professions that include design education, it is known that learning by doing is very important, and that this learning is conducted in the studio where master-apprentice relations are experienced. The term studio was defined in the Webster Dictionary as "the working place of a painter, sculptor, or photographer; a place for the study of an art (such as dancing, singing, or acting)" (Anonymous 1993). Studio in the sense of design education is the space where project courses are conducted.

The design studio is universally regarded as the most unique and the most important space allocated for design course activities, where the acquired knowledge and skills are integrated and applied (Stevens 1998). Design studios universally apply the semi-structured learning strategy of experimental approach (Delahaye 2005). According to Perkins, "Studio thinking [is] a vision not only of learning in the arts but what could be learning most anywhere". The studio thinking emerged from observation and analysis of teaching in visual arts (Hetland and Winner 2007). The advantages of the studio process are several, and could be observed to align with good practices in higher education (Biggs 1996). The design studio learning varies based on visual, verbal, tactile, written and communication potential. It also improves the teamwork capacity since the students work in groups in the studio environment (Nicol and Pilling 2000).

Educators consider studios not only as a space to learn by doing but as an instructional and learning environment where basic knowledge is used as well. This environment is very important in terms of contributing to design education using creative problem solving as an instructional tool. Design studios are ideal learning environments, where learners acquire initial knowledge about design education, develop their skills, could express their own ideas about design (Ketizmen 2002). In design studios, the most significant obstacle for students and faculty members is the lack of a common method that could fit every student and improve the students' achievements on the path that leads to creativity and design. The student must learn to cope with the difficulties encountered in design and develop design skills via the criticism provided by the faculty member within the context of master-apprentice relationship. In this process, the studio is the environment where the communications between the advisor and advisee are established (Ketizmen 2002).

One feature of the design studio is the fact that the target knowledge is not instructed directly and a synthesis of the knowledge that was acquired in other courses is expected (Ulusoy 1995). The aim of this process, which requires the student to study using all senses, should be to conceive creativity, develop cognitive abilities, and eye-hand coordination (Erzen 1976). The fact that design is a personal act and that it differs based on individual perception makes it difficult to conceive creativity and to instruct design. In the design process, it is necessary for students to acquire problem identification skills, provide different, extraordinary solutions for the problems, imagine the solution, to draw this imagination on paper, to think in a unique and three-dimensional manner, using applications that would improve and develop personal and occupational knowledge.

The education process in the landscape architecture discipline that aims to create spaces which would respond to the needs and requirements of the user based on specific design criteria is still a matter of debate today (Gazvoda 2002; Marusic 2002; Rodiek and Steiner 1998). Similar to the disciplines that include design and creativity process, styles and methods that would ensure the students to acquire design and creative skills are quite significant in landscape architecture curricula. The present study, which was based on the design process and its relationship with the studio environment, was scrutinized in the context of the Environmental Design Studio at Karadeniz Technical University, Landscape Architecture Department. The present study, carried out to determine the relations of the students with the studio environment and the views of students about the studio environment, scrutinized the studio work conducted in Environmental Design Project Course at Karadeniz Technical University Landscape Architecture Department.

Materials and Methods

The application section of the present study included two phases. The aim of the first phase included the contribution of the course supervisor to the studio process by evaluating the relationship between the student and the instructor and the products obtained at the end of the process as an observer. In the second

phase, the aim was to determine the educational impact of the studio environment, which the course supervisor evaluated based on the obtained products, by the students who experienced this environment. Thus, in the first phase, the effects of the process defined and explained by the course supervisor in abstract were supported by the assessment of the students in concrete terms (Figure 1).

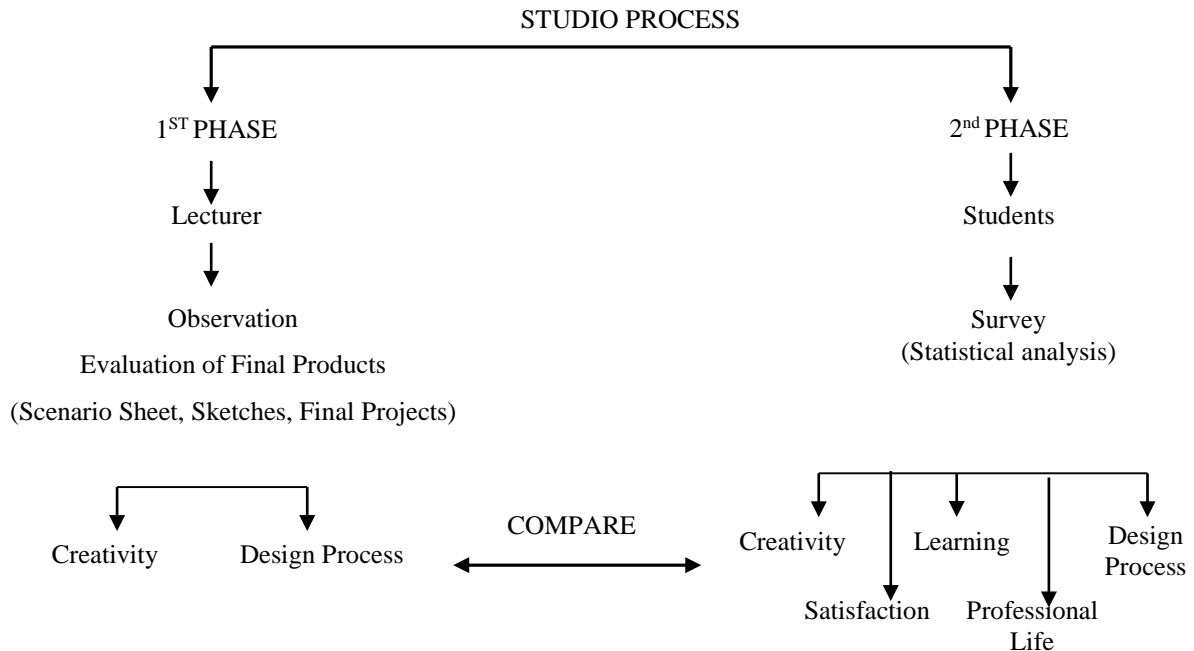


Figure 1. Research design

1st Phase

The present study addressed the Environmental Design Project course, which is one of the studio courses instructed at Karadeniz Technical University, Landscape Architecture Department. Initially, the content and procedures in the studio course were examined. Within the scope of this course, process-oriented design education was implemented instead of a result-oriented approach to improve students' design and creativity skills.

In the said process, first, the project title "Residential Environment Design" was introduced to the students. Students were allowed to conduct a literature review on the subject (abstract-character association, concrete-examples of actual design), and then asked to construct a list of activities that could be conducted in a residential environment. Later, the students were expected to select a user and an activity based on the needs of that user (main activity) and determine other activities related to the main activity and design a function scheme to develop their creativity skills. The students were expected to create formal approaches based on the predetermined activity list, the example and the scenario selected based on the conducted literature review and to present the said details in a scenario sheet.

Later on, sketches were drawn based on the abovementioned studies and model proposals were suggested. One of the proposals were selected and a scale suitable for the capacity, furniture adequate for the activity and form, in other words, the spatial construct was developed, and the final product was obtained. These products were all developed in the studio environment. As a result, the student produces knowledge, develops ideas and obtains an end product within a master-apprentice relationship in the design studio using the studio for a certain amount of time. The whole process was conducted in the studios under the supervision of the course supervisor (Figure 2).



Figure 2. Examples for the use of design studios

2nd Phase

As demonstrated by a study by Gasset's (1998), what really matters in education is the student. The work conducted in the studio that are related to both the educator and the student should be conducted in a student-oriented manner. The work should focus on the acquisition of the best possible improvement by the student, the maintenance of interaction, and on the review of the roles in the studio occasionally, considering that each student has different experiences. Thus, a questionnaire was applied at this stage to obtain the student views on studio education. The aim was to determine student perceptions and assessment on the studio, which was identified as beneficial for the students and education by the course supervisor. Advantages and disadvantages of the studio process and course practices that would further benefit the students were determined.

The survey was conducted with a total of 174 students, including 48 freshmen, 45 sophomores, 42 juniors, and 39 seniors, to investigate the effects of the studio course on design education. 93 students were female (53.5%) and 81 (46.5%) were male. In the questionnaire, students were asked to assess the effects of the studio process on creativity, didactic quality and the development of design skills, their satisfaction with the process and whether they would like to use the process in their professional lives. Therefore, a 5-point Likert scale (5: more, 1: less) and a survey study were used in the study, and T-test, one way ANOVA and correlation were run on the data acquired from students while processing them into statistical data. The following statements were included in the questionnaire:

- I think my creativity improved during this course,
- I consider the course instructional,
- The course process improved my design skills,
- I am glad that the studio process was included in this course,
- I would like to use the studio process, which is based on exchange of ideas, in my professional life as well.

Results and Discussion

Results of 1st Phase

The course supervisor first assessed the individual scenario sheets constructed by each student (abstract-concrete character association examples, original activity, function diagram). It was found that each student designed different scenarios (such as house of a stylist, a musician, or a painter) with different original activities and activity spaces (dance floor, catwalk, show area, concert area, etc.) (Figure 3).



Figure 3. Scenario sheet examples

At the beginning, it was determined that the students experienced difficulties in constructing the abovementioned scenarios, but within master-apprentice relationship provided by the course supervisor in the course, they were able to overcome these difficulties and succeed in obtaining original final products (Table 1). Concurrently, it was revealed that the studio environment improved student creativity, design skills, and the exchange of ideas with both the course supervisor and their peers based on the final products.

Table 1. Sketches produced in the design studio and the final products

Sketches			
Final Products(Drawings)			
Sketches			
Results of 2nd Phase	↓	↓	↓

Final Products (Drawings)



Findings on the effects of the studio process on education

Survey results demonstrated that the studio process helped develop mostly the creativity with a mean score of 4.20, followed by the improvement of design skills with a mean score of 3.95, and finally it helped the learning process with a mean score of 3.64. Findings demonstrated that the mean values for all answers were over 3. Therefore, it could be stated that the studio process was beneficial in the development of creativity, design skills, and learning of the students.

Analyses demonstrated that the differences between the answers were significant in all questions ($p < 0.01$). Mean and standard deviation figures for all questions are presented in Table 2 and distribution of mean scores between the classes are presented in Figure 4. Mean scores for all concepts increased with student seniority due to the improved understanding of students about the studio process by experiencing the process in every year of their training.

Table 2. Mean and standard deviation values for the questions and t-test results

	t	df	Std. Deviation	Mean Difference
Creativity	72,301	173	,765	4,195
Learning	44,271	173	1,086	3,644
Design Process	55,465	173	,939	3,948

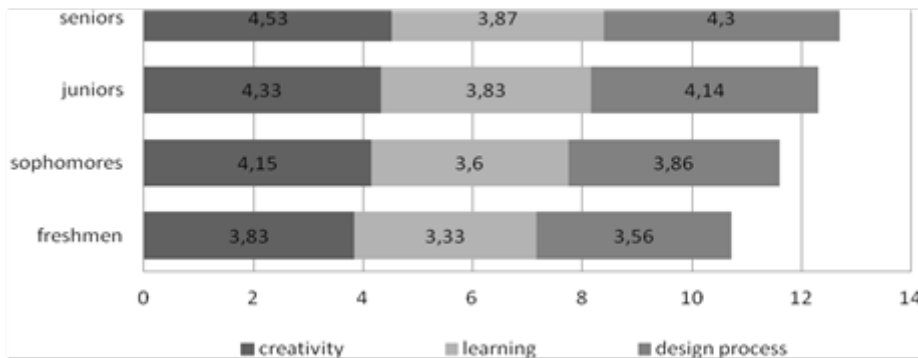


Figure 4. Graph of the responses given to the questions

Analyses demonstrated that the studio process affected the development of creativity at the highest level (72,301 t value), followed by the development of design skills (55,465 t value) and the least affected was learning (44,271 t value). However, the lowest correlation, the one with the level of learning was not low,

only the correlation between the studio process and the level of creativity and development of design skills were higher than learning.

The creative process was named by Ghiselin (1955) as the creative stage, and he described it as the transformations in the development of change in a subjective life (Cited by O'Neill & Shallcross 1994). Design education should not be based on the result but on the process. The creativity that emerges in this process has a cognitive structure and includes the stages of production and discovery (Smith et al. 1995). The results supported the view that the studios, where the designer encounters various different topics are beneficial for the students (Lökçe 2002), (Schon 1983). It was determined that the students experienced difficulties in producing the scenarios at the beginning of the studio process, but as a result of the master-apprentice relationship with the course supervisor, they were able to overcome these difficulties and succeed in obtaining original final products (Table 3). Furthermore, analysis of the final products demonstrated that studio environment developed students' creativity and design skills and the exchange of ideas with both the lecturer and their peers improved.

In fact, the objective of design education is to create the required conditions to enable creativity and to ensure that the student produces by experimenting with the exercises designed for this purpose in interaction with the professors. According to Pallasmaa (1996), design education should begin with the fundamental questioning of the absolute nature of the world and the removal of the boundaries in the student's senses. The objective of education is not only the instruction of artistic principles, but the development of the student's personality, self-views or views on the world, thus development of the student's design approach. When the studio environment is considered as the instruments of creative thinking, it is in the nature of the studio to take place in an environment that would provoke creativity when producing solutions and creating ideas (Ayiran 1995). Thus, it is one of the significant findings of the present study that studio work improve creativity, which is effective in all stages of design.

Findings on the satisfaction of the students about the studio process

About the question that whether the students were satisfied with the studio process in the environmental design project course, it was found that students were satisfied with the process at a level of 3.91 (Table 3, Figure 5). One-Way ANOVA test was conducted to determine whether the distribution of satisfaction of the students among the classes was significant. It was determined that the difference between the distribution of satisfaction among the classes was significant as a result of the conducted analysis (F: 7,160; p <0.01). Satisfaction level increased with the class level; senior class was the most satisfied class with the process. This was due to the fact that they have experienced and adapted to the process and recognized its benefits more than the other classes.

These are naturally gains that are expected as a result of course and studio process. This phase contains the findings of the supervisors' opinions. However, these gains may not be equal for every student, depending on factors such as the student's interest, ability, skill, and attendance. At the same time, it is expected that these gains will also change depending on the experiment (class difference).

Table 3. Distribution of the satisfaction level based on student seniority

Satisfaction Level	Freshman	Sophomore	Junior	Senior	Total
Very low	0	0	0	0	0
Low	9	8	2	0	19
Intermediate	14	8	7	3	32
High	15	17	18	18	68

Very high	10	12	15	18	55
Mean	3,54	3,73	4,09	4,38	3,91
Total	48	45	42	39	174

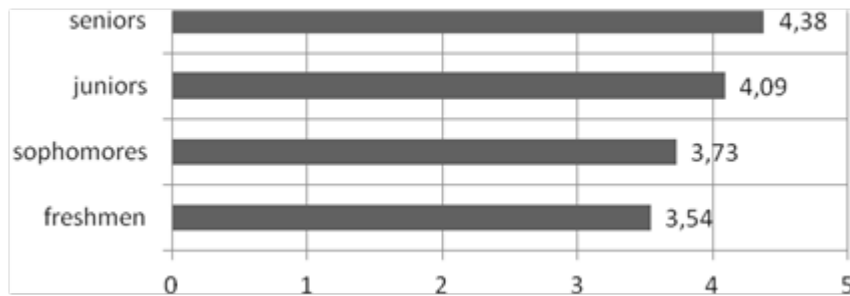


Figure 5. Distribution of the satisfaction level based on student seniority

Correlation analysis was conducted to determine the correlation between the satisfaction level and the education process (creativity, learning, development of design skills) (Table 4, Figure 6). Analysis results demonstrated that satisfaction with the process was mostly related to learning. All factors were effective on the degree of satisfaction. Furthermore, learning and design skills were identified as the most associated concepts. Although the students considered that their creativity improved the most in the studio process, the most effective factor on their satisfaction was learning. In other words, in this education process, the students learn to design, to improve their creativity, and thus the landscape architecture professional discipline, which determined the level of their satisfaction.

Study findings supported the view that design studios are environments that help participants to acquire a perspective to assess the social life and the agenda to improve their professional knowledge and their personal maturity (Alangoya 2015).

Table 4. Concepts associated with satisfaction

	1	2	3
(1) Creativity	-	,870**	,891**
(2) Learning		-	,906**
(3) Design skills			-
Satisfaction	,890**	,907**	,944**

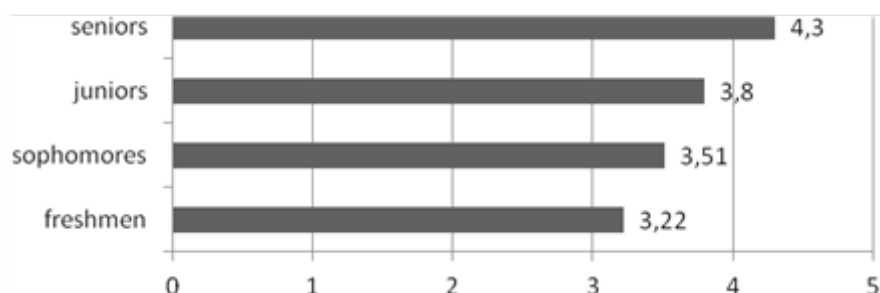


Figure 6. Distribution of the level of use in professional life among the classes

Findings on the use of studio process in professional life

It was determined that the students desired to use the studio process, which was based on the master-apprentice relationship, that is, the exchange of ideas, which they used in their training, in their future professional lives with a score of 3.68. The desire to use it in professional life increased with student seniority, in other words, as the students got closer to the professional life. The highest desire was expressed by the senior students (Table 5). One-Way ANOVA test was conducted to determine whether the distribution of satisfaction among the classes was significant. Analysis results demonstrated (F value: 9,009, $p < 0.01$) that the difference in the distribution of the desire to use the studio process in professional life based on the class level was significant. This was due to the increase in the awareness of the students as their graduation approached.

Table 5. Distribution of the responses on the level of use in professional life among the classes

Level of use in professional life	Freshman	Sophomore	Junior	Senior	Total
Very little	0	0	0	0	30
Little	14	11	5	0	45
Intermediary	17	11	11	6	49
Much	9	12	13	15	50
Very much	8	11	13	18	30
Mean	3,22	3,51	3,80	4,30	3,68
Total	48	45	42	39	174

A correlation analysis was conducted to determine whether these desires were related to their satisfaction with the education process. Analysis findings demonstrated that their desire to transfer the process to their professional lives was related to the satisfaction with the process at the level of 0,919 **. As a result, they want to use the satisfactory studio process in the professional lives because they considered it would be useful in their future professional lives and identified it with professional requirements.

The design projects conducted during education are different from the projects conducted in the professional environment, therefore the studio environment where the training was conducted was different from the one implemented in design offices (Teymur 1997). However, since the design process and objectives are the same, it is inevitable that they follow a similar process.

Students that aim to create successful urban spaces after graduation should be able to plan a detailed design by determining the needs and desires of the users. The design process requires association of several concepts this is a process that involves specific stages. Students who experience and learn this process in the studio environment would easily plan the design and construct successful urban spaces and in their professional lives (Düzenli et al., 2017; Eren & Var, 2017)

Düzenli et al. (2017) stated that students should be aware of the requirements and conduct a literature review (to find concrete and abstract examples) related to the subject, should accumulate the required knowledge and data and to assess this data and this habit should be achieved in the educational process. Findings of the present study are consistent with the results of the abovementioned studies.

The positive increase in all these findings for the 2nd phase is also dependent on the increase in the lessons, general knowledge and consciousness of the students as the class gets higher. The increase in these gains is not only related to the Environmental Design Project course described in the study; KTU Landscape Architecture is associated with the studio approach, which is a design education understanding.

Conclusion and Recommendations

The development of design education, which was shaped by various approaches until today, was pioneered by individuals and societies who believed in change (Gasset, 1998). Although contemporary educational environment has a pluralist structure that incorporates several approaches, design studios are the common education spaces of the past and the present.

Study findings demonstrated that both the assessments of the course supervisor and the students on the studio process were similar. The similarity was based on the fact that design studios are instructional environments that provide the students design skills, practice opportunities and develop their creativity. The study was not based only on the views of the course supervisor, but also those of the students who experienced the process first hand. It was determined that the students, who participated in the studio work without or with less absenteeism exhibited a behavior that entailed more creativity, more inquisitiveness than others and exhibited self-development and solution findings behavior. It was determined that the final products of the students who did not care about or disregarded the process were less qualified. According to Gasset (1998), while structuring the university, it is necessary to start with the student; the university should be the institutional reflection of the student. Thus, determination of student views in the present study is significant.

Creativity in design is very important. Creativity only emerges in environments that promote it, such as studios. By changing the learn-by-rote, classical and passive education system that the students are accustomed to in secondary education, studio environment helps students to acquire critical thinking skills and active learning habits. Design studios are significant in the analysis of the relationship between social life and the physical environment. It is possible to create a studio environment in the education field with more relaxed internal dynamics when compared to the practical field where needs should be satisfied rapidly, where the determined problem could be observed in depth, awareness about the analysis would increase with in-studio discussions and interdisciplinary contacts and creativity, design skills and the felling of learning could develop. Similar to the Dewey's (1987) definition of the school, the studio can be described as a space that does not provide knowledge for the students, but trains them to find their behavior style in life, and ensure that they acquire a thinking habit for this purpose. It is the process of learning by design in the studio that makes the design education unique and exclusive (Schön, 1985). Therefore, the studio tradition creates a self-experience of learning design. Thus, design education and studios where this education takes place is the most prominent factors in education.

The results of the both phases of this study (instructor and student assessments) are also important in terms of demonstrating the benefits of a design education approach that occurs in a specific period of time in the studio. The most important aspect of the present study was the fact that the educators, who instructed the studio course, but did not achieve the planned success, should review the studio process and recreate the process with discussions with the students and based on the student feedback.

In the future, it is obvious that the concepts shaped by novel technologies would be included in education. The current pace of change suggests that education should be prepared for a new communication environment. It is possible to argue that education, which is shaped by the concept of self-learning and constructed by learners' requests, would become increasingly informal. When the development of design education is examined, it could be observed that the master-apprentice system has always been applied for the transfer of design knowledge despite evolving educational approaches. Studio courses that could be developed with the opportunities provided by advancing technologies would guide instructors and students and continue to contribute to education. In conclusion, it was determined in the study that students were satisfied with the studio process because it was instructive and they also wanted to utilize this process in their professional lives. Thus, the design studio courses should be included in departments that provide art

and design education such as landscape architecture. Studio courses that could be developed with technological tools would contribute to education by guiding both the faculty members and students.

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