



DESIGN AS A CONVERSATION WITH LINES: 'SKETCHING AND FREE-HAND' COURSE EXPERIENCES

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Abstract

This study deals with the drawing experiences of second-year students in Landscape Architecture School and the process of teaching them the art of sketching. Sketching is defined as a way of visualizing a mental idea, which affords the designer a means to communicate with him/herself. Improving sketching abilities of student designers is, therefore, a fundamental part of design education. However, research focused on this process in Landscape Architecture education is not common and information on approaches to teaching sketching is fragmentary. This study aims to share the sketching experiences of landscape architecture students.

1. INTRODUCTION

Free-hand sketching is an activity that probably all humans engage in, almost like writing [1, 2]. This is especially true for designers, visualising ideas as drawings is an important need [3]. Sketching is defined as way of visualizing a mental idea that makes the invisible visible. With the aid of sketches the abstract world is linked with the material world and ideas can thus be developed [4]. Therefore, the role of sketches as tools for thinking has been emphasized frequently [2, 5, 6, 7, 8, 9, 10, 11] and even their making is itself defined as thinking [2]. Architects have the habit of making study sketches in the very early stages of handling design problems [1]. In the first stages, sketching may be like brainstorming where different ideas are recorded randomly [12]; these sketches are usually fast, spontaneous and direct, easy to produce and, therefore, cognitively economical. They provide instant feedback and in this way the sketcher can enter into conversation with his or her materials [1, 2, 13].

Vagueness, incompleteness, ambiguity, the fluency of its production can be listed as the properties of the free-hand sketches [12]. These properties of a sketch are thought to be associated with interpretation, innovation and creativity [15, 16]. Designers use sketches as research tools to explore and discover spatial concepts and relationships, to help generate an idea rather than to record it, to perform formal and functional reasoning [4, 17, 18, 19]. Therefore, free-hand sketches were defined as one of the main design development tools, which are generally 'thinking' drawings [20]. According to Tovey and Porter [19] exercising this skill can be mentally relaxing, which in turn can reduce the inhibitions on the flow of thought.

Sketching involves a cyclical process of re-interpretation [21] in which the designer uses a series of rapid sketches to transform images in a cyclic manner [19]. Representations are produced, evaluated, transformed, modified, refined, and replaced by others if need be, until their maker is satisfied with the

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results [2]. This is an on-going process of selection, reflection and change [22]. It includes both seeing and thinking about the subject being represented [17] and a dialectic type of argumentation between 'seeing-as' and 'seeing-that' [1]. Goldschmidt [1] explains as when using figural, or 'gestalt' argumentation the designer is 'seeing as' and when 'seeing that', the designer advances non figural arguments pertaining to the entity that is being designed.

Environmental designers are visually oriented and they draw to develop ideas graphically; in the process of drawing, designers communicate their thinking [17]. Since improving sketching abilities of student designers is a fundamental part of design education, sketching is offered either as a required or an elective course in design schools [12]. Bilda et al. [16] sees the ability to read or produce sketches as the only way to develop expertise in architecture. Since it is important to learn how to think with sketches, a challenge of design education is the question of how to help students develop sketching skills in design problem-solving. How can students be taught to develop and apply visual reasoning by using sketches to solve new design problems? What are the best approaches in teaching sketching? Studies focused on sketching activity are common; however, research on sketching education is relatively rare. Therefore methods and approaches in sketching education need greater attention and sharing. Also research focused on the process of sketching in Landscape Architecture education is not common and information on approaches to teaching sketching is fragmentary. This study aims to share sketching experiences of landscape architecture students. This article discusses the practices of 'Sketching and Free-Hand' course and approaches to develop landscape architecture students' sketching skills. The students' works were evaluated in terms of their sketches. The results of this study may provide insights for educators in developing strategies in teaching and learning of sketching and design. Developing such strategies in teaching and learning sketching is an ongoing debate in architecture education. We aim to expand this area of information by including landscape architecture students' experiences.

2. The Roles of Sketching in Design

Table 1. The categories used in sketching researches

Researcher(s)	Classification is based on:	Categories
Goel [23]	Transformations/ types of operation	<p>Lateral: movement is from one idea to a slightly different idea</p> <p>Vertical: movement is from one idea to a more detailed and exacting version of the same idea</p> <p>Duplication: a movement from one drawing to a type-identical drawing</p>
Goldschmidt [2]	Configurations (according to the moves)	<p>Combinatory: positioning of elements adjacent to others (horizontally, vertically, or diagonally), or inside of others</p> <p>Restructural: size variations among components, embedding, modification, subtraction, altered proportions, and complexity of junction</p>
Verstijnen, Hennessey, van Leeuwen & Hamel [24]	Function of the sketch	<p>Idea sketches: early phases of design</p> <p>Presentation sketches: last phases of design</p>
Bar-Eli [5]	Function of the sketch	<p>Realization sketching profile: emphasis on an applicable solution; understanding and imagining a realistic situation and developing various solutions.</p> <p>Learning sketching profile: emphasis on the given problem; understanding design problems and developing various options for design language.</p> <p>Designer/reflective sketching profile: emphasis on the personal design process; personal thinking through the understanding of a design idea and the development of personal design processes</p>
Ferguson [25] van der Lugt [21]	Function of the sketch	<p>Thinking sketch: supports the designer's thinking activity</p> <p>Talking sketch: a medium for communication in group discussions</p> <p>Prescriptive sketch: specifies designed objects</p> <p>Storing sketches: can be revisited at a later point in time, intended for retaining information</p> <p>Storing sketches: refer to the designers using the drawing surface to archive design ideas for their own future reference. The storing sketch is intended for retaining information.</p>
Goldschmidt [26]	Cognitive process	<p>Seeing as: as when using figural, or 'gestalt' argumentation; the emergence of new ways of seeing the perceptual (drawn) representation of a potential design</p> <p>Seeing that: non figural arguments pertaining to the entity that is being designed; new knowledge becomes part of the problem solving process</p>

The functions or roles of sketching in terms of their contribution to the design process or designers were frequently discussed in design studies. In this study we classified these roles into three categories and explained the functions of sketches depending on the findings in the literature. First designers visualize their ideas and record them, then read the new information and reinterpret the sketch, and by doing these through their sketches designers communicate with themselves; our classification is mainly based on these three phases.

2.1. Sketching as a tool for externalizing and recording mental images

A sketch is made for externalizing a mental image [3, 6] therefore they are frequently used to record and store ideas for later use [27, 28]. Also sketching is not only an instrument allowing the representation of the idea itself, but making it visible [8] as an external memory [19] for a rapid exploration of design alternatives [28]. Thus sketching acts as an essential bridge between the imagined and real worlds [20].

2.2. Sketching as a source of new information and discovery

Goldschmidt [2] emphasizes the role of sketches as a source of new information and suggests that ascribing meaning to the unintended consequences of a rapidly made (free-hand) sketch is what is allowing for this. She also defines sketching as a tool that has the potential to enhance design reasoning [2]. Manolopoulou [4] suggests that “sketches work as intuitive devices, stimulating the imagination, entailing spontaneous action, but also posing questions and tempting one’s curiosity to explore things through longer processes”. Suwa and Tversky [29] suggest that sketches allow architects to discover non-visual functional relations underlying the visual features and perception of visual attributes of sketched items, e.g. sizes and shapes/angles, plays an important role in this. In other words, sketches provide visual cues for the association of functional issues and facilitate problem solving and creative effort [19].

2.3. Sketching as a tool for designers to communicate with themselves

Goldschmidt [2] argues that “the self-generated sketch talks back, and its backtalk reflects some of the sketcher’s innermost, tacit, otherwise untapped knowledge, biases, concerns, and preferences”. Thus sketching allows the designer to communicate with themselves by supporting activities such as experimenting, and to revise and look for alternatives [2]. Through sketches, designers can also recognize conflicts and possibilities [30] and revise and refine ideas [19]. Sketching also supports organizing dispersed thoughts and transforming them into visual imagery [3].

3. Sketching and Free-hand Course

3.1. Aims and content of the course

Soygenis et al. [12] emphasized the importance of teaching sketching more efficiently and integrating sketching into the studio environment more vigorously, which cannot be neglected. Thus courses on sketching are integrated into the curriculum and teachers are in pursuit of developing strategies for teaching sketching [12]. The Sketching and Free-hand (SF) course in Karadeniz Technical University (KTU) Landscape Architecture department is an elective course for second year/fall students. The course adopts an approach parallel to Environmental Design Studio (EDS) and includes exercises of sketching and one-on-one critique. Student and teacher discuss the student’s sketches on a regular basis as often as once a week. Similar to EDS in this course the studio is a ‘learning by doing’ environment, and students acquire design skills and knowledge, under the guidance of the teacher. The discussions/one-on-one critiques are, most of the time, informal. The one-on-one critique typically lasts between 10 and 15 min and sometimes takes place at the student’s desk or sometimes students gather around a presentation board with the teacher in the studio. Initially the student reports what s/he has drawn and describes its development since the previous critique, then the teacher comments. Sometimes they may ask for clarifications, and in this way help the student make progress in the desirable direction. In this term students took the EDS II course at the same time. Since EDS I consists of working on a model, EDS II is the first project that students encounter with sketching practices. Therefore the SF course takes place at the same time as EDS II. In the first 4 weeks of the 14 weeks period students were encouraged to practice shape formations through visual analogy in order to enhance their visual imagery, since they are novice designers. İnceoğlu [3] suggests that using visual analogy in design practices is common and it contributes to the designer’s creativity. Some other research showed that instructions to use a fruitful strategy like visual analogy allows even novices to significantly improve their performance and the

generation of new relevant structures through the use of visual analogy can provide a basic mechanism to develop skills in design problem-solving [31]. During the second part of the course, which consists of 10 weeks period, students were given a task of designing the outdoor environment of a residential building, which is divided into sub-tasks. Since design problems are ill-defined, novice designers will have difficulties in controlling the design process. By dividing design task into subtasks we aim to ease the complexity of design problems for students. For dealing with the ill-structure and nature of design as problem solving activity, Simon [32] proposed decomposing the problem into goals and sub-goals where the designer finds partial solutions for the sub-goals. Similarly Goldschmidt [13] suggests that a design solution is composed of many interconnected partial solutions at different levels. As they gain expertise in design they will be able to control these phases in a more complex and cyclical way.

In this study we focused on teaching method/strategies in the SF course: not just ‘how to sketch’, but how to sketch in ways that facilitate emergence and reinterpretation. We suggest a strategy for supporting and enhancing the development of this skill. We focused on a methodology that aims to enhance the sketching skill and make a habit of it. The SF course in KTU aims to teach students how to develop their ideas through sketching in a process; while learning how to sketch they are also learning how to develop ideas. They start with one design proposal and develop it into another one as they complete the sub-tasks that they were given.

Thus the aims of the course are: (1) to help novice designers to understand the process of design. (2) To provide them with an approach to how to solve a design problem. (3) To enhance their knowledge of drawing language and techniques and enhance their skill in using these in a rapid and flexible way; the sketching exercises that took place during the whole course period enhance their drawing skills by improving their brain-hand-eye coordination; this also helps students by enhancing their self confidence). (4) To improve their sketching, free-hand skills. Curry [33] suggests that special exercises can be devised to increase skills or learn fundamental concepts where the tutor acts as a guide, leading the student through the process. This kind of exercise is called ‘deliberate practice’ and concerns the refinement of skills and competencies by focused repetition [33]. (5) To facilitate the effective acquisition of design expertise through improving the sketching skills. Soygenis et al. [12] suggest that improving the sketching skills of students may lead to developing their design skills use sketching as a means for thinking and expressing design ideas and decisions.

3.2. Teaching Approach and Practices of the Course

In this course the approach that accepts the design process as ‘the conversation of designers with themselves in which the sentences/inner thoughts of the designer are reflected in sketching through lines’ is emphasized to the students and they are encouraged talk/think (inner or aloud) while sketching. According to Suwa and Tversky [29], sketches are a good medium for reflective conversation with one's own ideas and imagery. The sketching process has been described as “the designer having a conversation with the drawing” [34] which is a definition that has gained recognition in design disciplines. There are many researchers who have made similar description of the sketching process. Similarly Laseau [35] stated that “the process of graphic thinking can be seen as a conversation with ourselves in which we communicate with sketches”. Some researchers have determined a relationship between the quality of the sketches and the quality of the texts that describe them which suggests a relationship between two modes of thinking, verbal and visual [12]. In their study Avidan and Goldschmidt [36] argues that language is an integral part of the design process and can reflect its potential alongside visual artifacts. Johnson's [37] study revealed that design ideation was an interaction, or a dialogue between visualization (non-verbal) and language (verbal). İnceoğlu [3] defines a sketch as a communication space which allows the designers to have a dialogue with themselves. The inner talks are reflected with the lines; the skill of the designer to communicate between previous experiences, inspiration sources and the ideas depending on these are reflected in the exploration trials with sketches. Goldschmidt [1] divides the design process into ‘moves’ and ‘arguments’. ‘Arguments’ are related to a particular design move and are statements about the design or aspects of it. In other words they reflect the dialogue of the designer and the interrelated moves are the result of reasoning that the designer has made, depending on these arguments.

Manolopoulou [4] defines sketches as ‘alive and changeable’, thus they form questions as much as answers; therefore seeing sketches as a communication space for designers is not an irrelevant approach.

We gave students a design problem and we asked them to carry out a sequence of four tasks. Students were asked to design the outdoor spaces of a residential building for a family of four. This task was phased to include a 10 weeks period and each phase is given as a sub-task to students. Each task in the sequence was given and carried out separately. In this context areas for (1) eating (with family members or guests), (2) sitting and conversation (3) sunbathing, (4) swimming, and (5) circulation were requested around a given building. The subtasks for the design problem are: (a) identification/exploration of activities, (b) relating and locating activities, (c) defining the sizes and capacities of activity areas and as the last generating form for the areas. The first subtask (a) includes students needing to imagine and think about how each activity takes place or happens, with their pencil on the paper. For each activity they imagined themselves as one of the users of the areas and left a mark for each interaction with any of the spatial components. The next subtask (b) requires thinking about the circulation from one area to another one, which activity is related to which one and which ones are unrelated and, depending on these, how they can be located in relation to the house. Defining the size and capacities of the areas includes determining approximate sizes of the areas depending on the desired equipment and user numbers. The last phase is generating forms for the areas’ locations and sizes, which were determined approximately. In this phase students were requested to make visual analogies similar to exercises at the first part of the course. In each phase students were encouraged to discuss, ask questions (should I try this? Should I change its location? Is this appropriate? Maybe I should enlarge it. Should I rotate it to the left? And so on) and produce alternatives through their sketches. In this process students were expected to ask questions of ‘why?’, ‘why not?’ as much as possible, make interpretations and suggestions like ‘try this one also’ ‘what if it should be tried like this?’ and develop their ideas that satisfies their lecturer. They were asked to try, discuss each new idea by layering a new tracing paper. This interactive process leads to the generation of a range of related sketches. The ability to make long interrelated chains of moves are accepted as the indicator of students successful dialogues with themselves. According to Goldschmidt [2] by using overlays, the designer achieves great flexibility in performing a variety of transformational acts s/he may choose to exercise and experiment with (e.g., shifting, rotating, and flipping over a layer in relation to other layers). It also supports experimentation in that layers may be easily removed (discarded or saved for future reference), should an idea prove futile [2]. For design experts the number or the variety of marks in sketches may not reflect the success of their dialogue, they can manage to develop their ideas with a few marks and trials. However for novice designers like SF course students we expect to see numerous marks in interrelated series which reflects coherence in developing an idea. The sketches with unrelated layers of marks, undeveloped vague ideas evaluated as unsuccessful. At the end of the term students were asked to organize their sequenced sketches for all subtasks to form a sketch pad and to deliver it for evaluation.

4. Evaluation of Student Works

Students sketch pads that include the interrelated/successive sketches were evaluated by three design instructors in the same department. They are all experienced instructors of landscape design. The sequences of sketches for each student were displayed on a board, and each instructor evaluated and graded the quality of students work separately in terms of interrelatedness of sketches, development of an idea, trials for explorations with numerous marks, the quality of the drawing, the level of expression of the idea, and the composition of the sketch. These properties are accepted as indicators of the intensity of the dialogue that students had with their drawings. Means of the scores were calculated for each student. Four student works with (two successful and two unsuccessful) different characteristics were analyzed in this study. However, since there are many layers of sketches, not all of them were presented here. For explaining each student’s sketching character we used an approach similar to a previous study [38] in which every successive sketch of the students’ sketching activity was identified in terms of which transformation had taken place in each case. An obvious change in thinking is accepted as a lateral transformation, while if the change is instead to a more detailed version of the same idea then it is accepted as a vertical transformation. When there is no obvious change it is accepted as duplication.

Student 1(Score 85; Figure 1): Starts with numerous marks, vagueness reflects the variety of arguments. 1. Borders of spaces are become clearer. 2. Size and the number of the areas were changed, new areas were added and discussions of equipments can be seen, capacity testing. 3. Removed some activity areas, changes in size, equipments getting clearer. 4. Decision on the size of spaces and location of equipments. 5. Numerous discussions about the configuration, changes in rotation and location of marks, capacity testing. 6. Decision on borders of the spaces. 7. Situating equipments, small changes in borders, added sub-spaces.

This student's successive sketches include both lateral and vertical movements. Layers showed consistency to a large extent. For all instructors involved in evaluation the most successful sketching series was belonging to this student with the highest score. Goel [23] suggest that good design is a result of balance between lateral and vertical transformation. Evaluation of this student's works supports this. Sketches of this student exhibits flexibility in terms of size, form, direction and arrangement of their lines. This student searched for different alternatives but at the same time the drawings exhibit a certain level of consistency. We accepted this as a reflection of richness of student's inner conversations during design period.

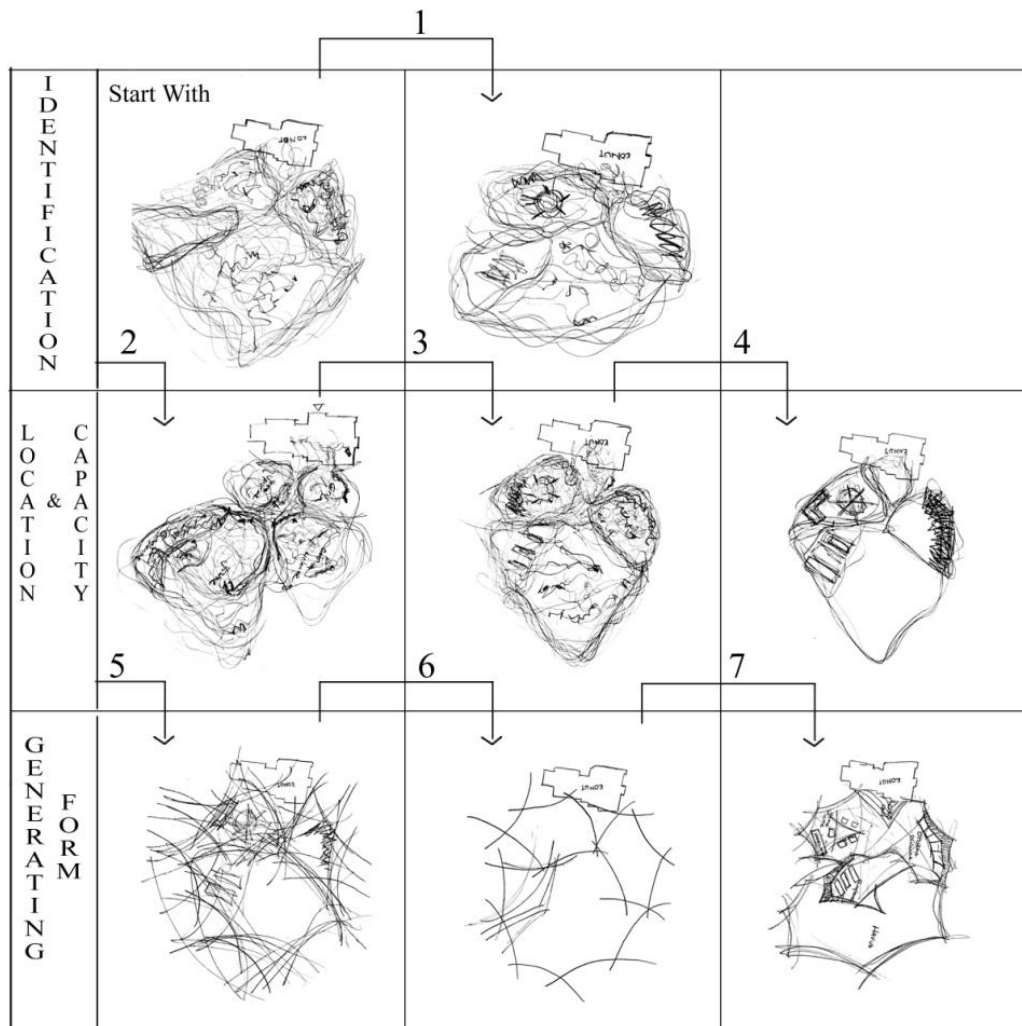


Figure 1. The sketching sequence of student 1

Student 2 (Score 80; Figure2): Starts with a sequence of spaces. 1. Some spaces are removed, changes in size. 2. Changes in location and size of spaces, new spaces added. 3. Changes in size of the spaces. 4. Capacity testing, traces of equipments can be seen. 5. Geometric transformation, changes in size and location and size, capacity testing. 6. Definition of form, capacity testing, discussions of appropriate size. 7. Addition, geometric transformation; some elements are rotated. 8. Defining borders and situating equipments.

Though this students sketching sequence was evaluated as successful, it cannot be placed at the same level with the previous one since most of the sequences showed vertical movements. This student showed a tendency to become trapped in one mode.

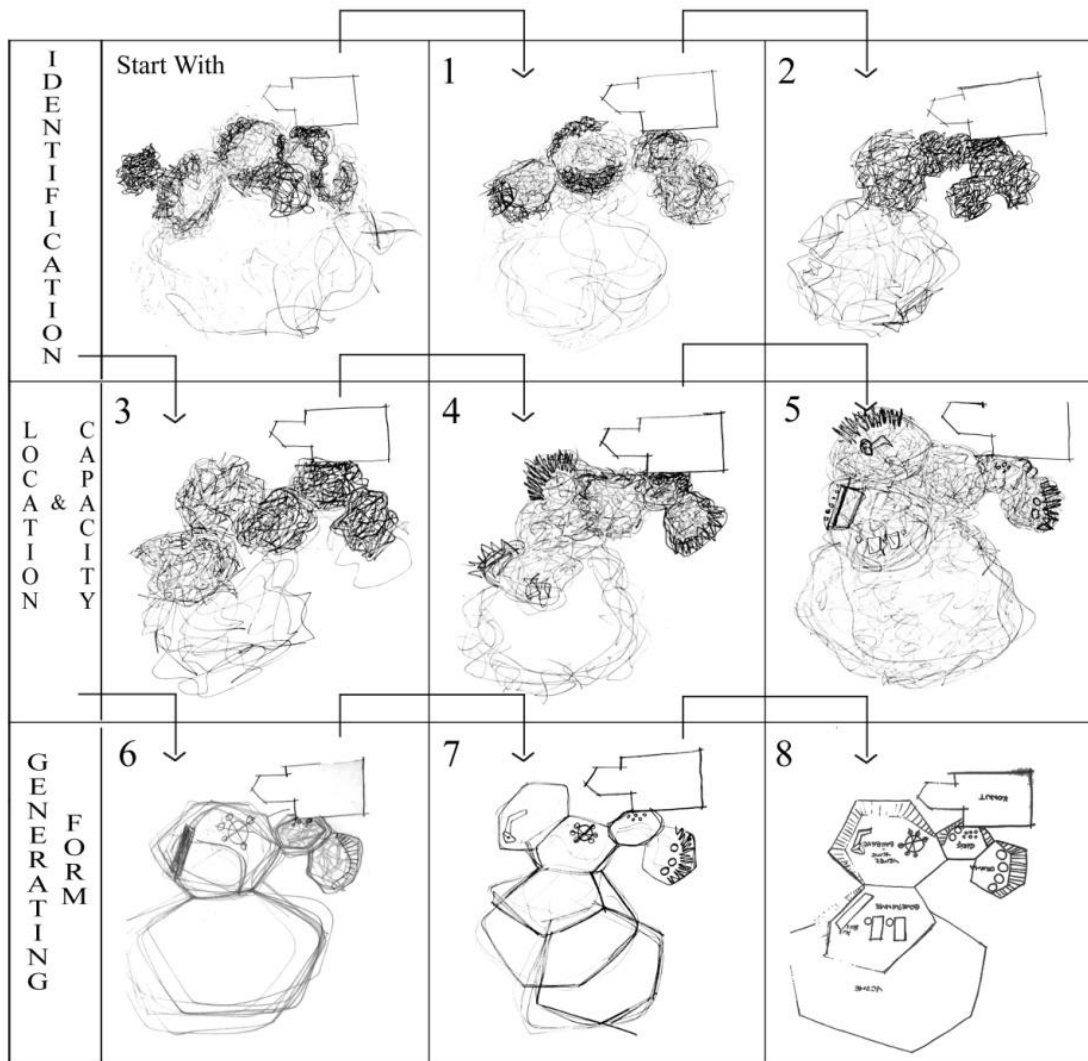


Figure 2. The sketching sequence of student 2

Student 3 (Score 55; Figure 3): Starts with circulation marks, uncompleted-undecided areas and uncertainty, a high level of vagueness that reflects an inadequate appraisal of the internal representations for the task [9]. 1. The borders of the spaces become clearer. 2. Mostly duplication, some parts were removed. 3. Division; some spaces are subdivided. 4. Capacity testing, changes in size of spaces. 5. No formal changes or searches in generating form phase, situating equipments 6. Mostly duplication, some spaces were removed.

This sequence of sketches was evaluated as unsuccessful because of the uncertainty of the first layers, which reflects an inadequacy of information and a tendency for duplication. The inadequate level of transformations reflects the lack of dialogue of student with the drawings.

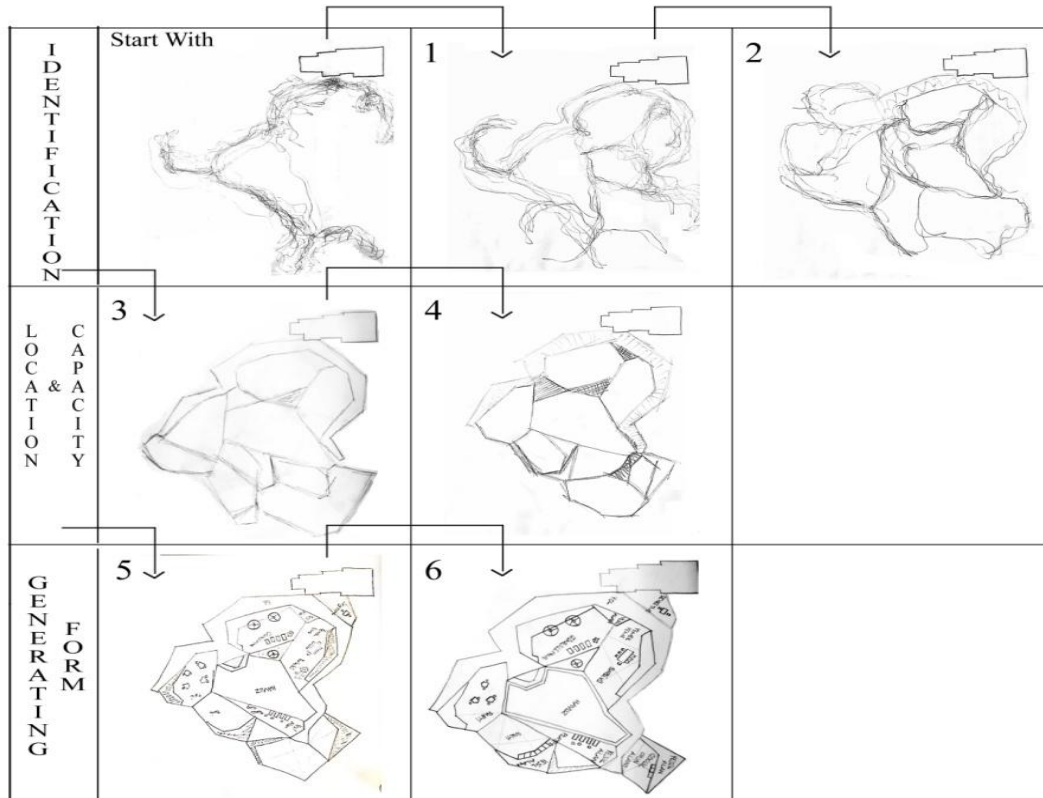


Figure 3. The sketching sequence of student 3

Student 4 (Score 45; Figure 4). Starts with vagueness, numerous marks. 1. Division, the same outline with previous one with subdivisions, the borders of the spaces became clearer. 2. Duplication, the same ideas with previous one was repeated. 3. The same ideas with the previous one were repeated, capacity testing. 4. The outlines were emphasized with linear marks, the same ideas were repeated. 5. The same ideas were repeated, inert changes in size, equipment were situated, still contains some level of uncertainty.

This student's sketches reflect a 'fixed idea'. The movements contain no new ideas or development of an idea. She became trapped in duplication mode, which all instructors evaluated as the most unsuccessful series. Duplication mode reflects the lack in discussions or reinterpretation of the student.

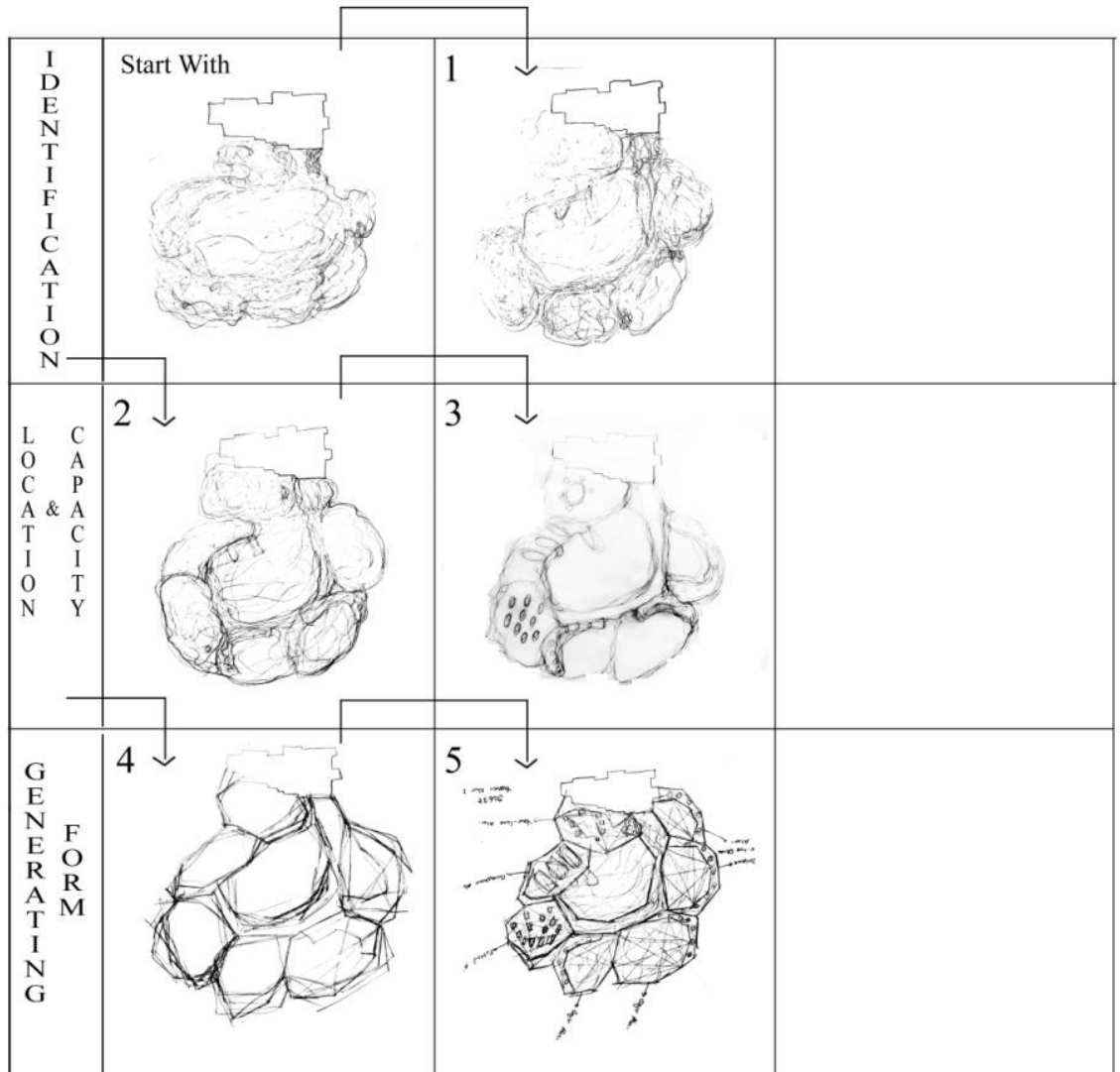


Figure 4. The sketching sequence of student 4

To sum up: the sketching sequences that were evaluated as successful contain both lateral and vertical movements, which we accepted as the reflection of the conversation skill of students with their drawing. Unsuccessful ones showed a high level of incompleteness or uncertainty and a tendency for duplication. These properties reflect that students were unable to dialogue with their sketches or make interpretation and the low level of their cognitive (visual and verbal) skills.

5. CONCLUSION

Improving the sketching abilities of student designers is a fundamental part of design education; therefore sketching courses are integrated into the curriculum, either as a required or an elective course in design schools. The teachers of the sketching courses are involved in developing strategies for teaching sketching. In this study we dealt with a challenge of design education which is the question of how to help students develop sketching skills in design problem-solving. We shared the approaches and teaching strategies of the Sketching and Free-hand course and the students' experiences of sketching practices throughout this course.

In this course we take the approach that accepts the design process as 'the conversation of designers with themselves in which the sentences/inner talks of the designer are reflected in sketching through lines', which is emphasized to the students and they are encouraged talk/think (inner or aloud) while sketching. We gave students a design problem and we asked them to carry out a sequence of four tasks. Students were encouraged to discuss, ask questions (Should I try this? Should I change its location? Is this appropriate? Maybe I should enlarge it? Should I rotate it to the left? And so on) and produce alternatives through their sketches.

The evaluation of the four student works shown here revealed different sketching characteristics. Those student works with high scores displayed more interrelated movements and transformations. The most successful one showed both lateral and vertical movements in a cyclical way. Goel [23] suggest that good design is a result of balance between lateral and vertical transformation. Evaluation of this student's works supports this. As the level of success begins to fall, the students showed a tendency to become trapped in one mode (duplication). The least successful student's work is a salient example of this. Most layers were a duplication of the previous one; there was no clear development of an idea. We accepted successful sketches as the reflection of inner conversation of students and their verbal skills depending on the researches that revealed a relationship between visual and verbal skills [36, 12]. Bar-Eli [5] suggests that with regard to implications on education, both students and educators can benefit from the identification and clarification of the differences between design students in terms of their way of sketching and its influence on their design approach. Therefore a better understanding of sketching and design behavior patterns may serve as a basis for the development of various pedagogical concepts, strategies and tools, and may allow students to better understand the relationship between their world of thought and experience and their design process [5]. To this end, the focus of this paper was the description of a study of student designers at work in the early stages of design, with particular emphasis on the visible sketching.

In Turkey the importance of teaching sketching in Architecture and Industrial Design curriculums is widely accepted; however, in Landscape Architecture curriculums, sketching is a commonly neglected issue. This study focuses on this neglected issue and aims to understand and explain the first sketching experiences of Landscape Architecture students. Though differences were determined in students' works, the reasons behind these were not considered in this study. The level of design abilities, level of knowledge about design subject, degree of interest, past experiences etc. can be the reason behind these differences. Future research will focus on these and other factors. Also alternative approaches must be discussed for the students who had problems managing the process and difficulties in producing sketches. Another limitation of our work is that the assumption that sees successful sketches as the reflection of inner conversation of students and their verbal skills is not tested. Future research will deal with this fact in depth.

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