

ISTANBUL OKAN UNIVERSITY
FACULTY OF ART, DESIGN AND ARCHITECTURE
DEPARTMENT OF ARCHITECTURE



STORYTELLING AS A LEARNING TOOL IN ARCHITECTURE DESIGN STUDIO

A Dissertation

submitted by

DANAH MUNIR TUFFAHA

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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Program: Ph.D. Program in Architecture (English)

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ABSTRACT

STORYTELLING AS A LEARNING TOOL IN ARCHITECTURE DESIGN STUDIO

This research examines the effect of applying Storytelling as a learning tool in architecture design studios classes. It aims to help overcome some of the current learning challenges and shortcomings in students' design skills learning. Newly graduated students from schools of architecture are encountered with challenges surrounding their design skill capability when entering the professional practice. The researcher believes that these difficulties start in design studio classes. The gap between academic learning and practicing profession is a concern many scholars are continuously trying to tackle. The researcher investigates the shortcomings in design studio learning and suggests that Storytelling can be a learning tool to help students and teachers overcome these shortcomings. The researcher conducted a two-phase experiment in a design studio class at Okan University. In the first phase the Researcher collected data using quantitative and qualitative methods that illustrate the current condition of students' design skills, as well as areas of shortcomings and challenges that need to be addressed. In the second phase, the Researcher used action research methodology and applied Storytelling as a strategy of combining reflective and experience learning theories in design studio class. According to the outcomes at the final jury and collected questionnaires, the results of this experiment were generally successful. Most of the students proved significant progress in terms of design skills and creativity. Moreover, students' presentation skills showed broad improvement and in return their self-confidence and understanding of submissions has advanced drastically. The researcher recommends this research to work as a model study for other scholars to adopt, develop and lead more similar researches in the future.

Keywords: Creative Problem-Solving, Design Skills, Design Process, Design Studio, Design Tool, Learning, Narrative, Reflective and Experience, Storytelling, Teller, Listener, Decision Making

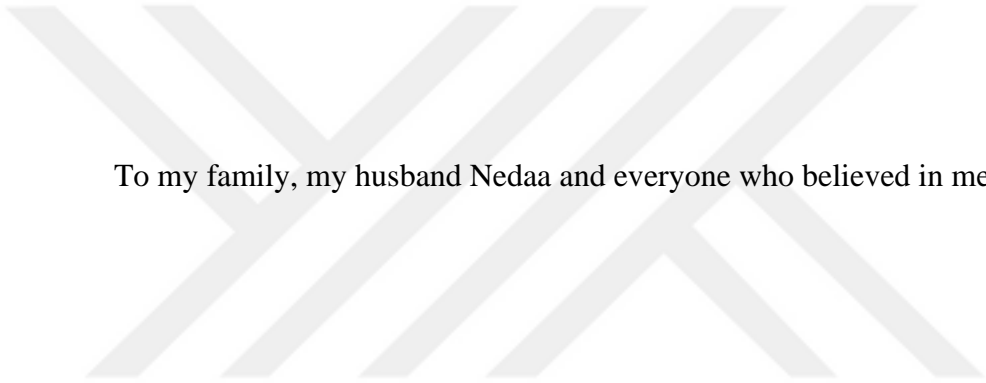
KISA ÖZET

MİMARİ TASARIM STÜDYOSUNDA BİR ÖĞRENME ARACI OLARAK

HİKÂYE ANLATIMI

Mimarlık okullarından yeni mezun olan öğrenciler, mesleki uygulamaya başladıklarında tasarım becerisindeki kabiliyetlerini çevreleyen zorluklarla karşılaşmaktadırlar. Araştırmacı, bu zorlukların tasarım stüdyosu derslerinde başladığına inanmaktadır. Akademik öğrenim ile mesleki uygulama arasındaki boşluk pek çok bilim adamının sürekli olarak ele almaya çalıştığı bir meseledir. Araştırmacı, tasarım stüdyosu öğreniminin eksik yönlerini incelemektedir ve bu eksik yönlerin üstesinden gelmek için Hikâye Anlatımının öğrenci ve öğretmenlere yardımcı olacak bir öğrenim aracı olarak tavsiye etmektedir. Araştırmacı, Okan Üniversitesinde bir tasarım stüdyosu dersinde iki aşamalı bir deney yapmıştır. Birinci aşamada, öğrencilerin tasarım becerilerinin mevcut durumunu, eksik yönleri ve ele alınması gereken zorlukları da gösteren niteleyici metodlar kullanarak veriler toplamıştır. İkinci aşamada eylem araştırma yöntemini kullanmış ve tasarım stüdyosu dersinde hem yansıtıcı hem de deneyimleyerek öğrenme stratejisi olarak Hikâye anlatımını uygulamıştır. Final jürisindeki sonuçlara ve toplanan anketlere göre bu deneyin sonuçları genel olarak başarılı olmuştur. Tasarım becerileri ve yaratıcılık açısından öğrencilerin çoğu önemli bir gelişme göstermiştir. Dahası öğrencilerin sunum becerilerinde göze çarpan bir ilerleme gözlenmiş ve buna karşılık öz güvenleri ve sunum anlayışları ciddi anlamda gelişmiştir.

Anahtar Kelimeler: Yaratıcı Problem Çözme, Tasarım Becerileri, Tasarım Süreci, Tasarım Stüdyosu, Tasarım Aracı, Öğrenme, Anlatı, Yansıtıcı ve Deneyim, Hikâye Anlatımı, Anlatıcı, Dinleyici, Karar Verme.



To my family, my husband Nedaa and everyone who believed in me

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TABLE OF CONTENTS

| | |
|--|-----|
| LIST OF TABLES | XI |
| LIST OF FIGURES | XII |
| I. INTRODUCTION | 1 |
| 1.1. AIMS AND OBJECTIVES..... | 12 |
| 1.2. QUESTIONS AND HYPOTHESIS | 13 |
| 1.3. RESEARCH PARADIGM..... | 16 |
| 1.4. RESEARCH METHODOLOGY..... | 17 |
| 1.4.1. Qualitative Research | 19 |
| 1.4.2. Phenomenology..... | 20 |
| 1.4.3. Action Research | 21 |
| 1.5. METHODS OF DATA COLLECTION | 22 |
| 1.5.1. Guidelines | 23 |
| 1.5.2. Design as a Research Tool..... | 25 |
| 1.6. RESEARCH DATA COLLECTION TOOLS..... | 28 |
| 1.7. LIMITATION OF THE STUDY | 28 |
| 1.8. RESEARCH SUMMARY | 29 |
| 1.9. PREVIOUS STUDIES..... | 31 |
| II. LITERATURE REVIEW..... | 34 |
| 2.1. DESIGN STUDIO'S UNIQUE LEARNING ENVIRONMENT | 37 |
| 2.2. LEARNING ARCHITECTURE DESIGN SKILLS AND DECISION MAKING | 43 |
| 2.2.1. Architecture Design Skills - Design Culture | 44 |
| 2.2.2. Architecture Design Skills - Design Process | 45 |
| 2.3. LEARNING DESIGN SKILLS IN DESIGN STUDIO SHORTCOMINGS..... | 48 |
| 2.3.1. Academia and Practice Design Process Disconnect and Confusion..... | 50 |
| 2.3.2. Lack of Project Brief Understanding Creates Premature Solutions..... | 51 |
| 2.3.3. Representations Difficulty: Student Architecture Language Blocks Development | 52 |
| 2.3.4. Student Design Culture Challenging Design Process | 54 |

| | |
|--|-----------|
| 2.3.5. Teacher Design Cultures Challenging Student Creativity | 54 |
| 2.3.6. Design Studio thrives Fashion and Individualism | 55 |
| 2.3.7. Brief Teaching-Learning Time in Design Studio | 55 |
| 2.3.8. Traditional Teaching in Design Studio Produces Dependent Students | 56 |
| 2.4. CHALLENGES OF LEARNING DESIGN SKILLS IN DESIGN STUDIO | 56 |
| 2.4.1. Architectural Design Studio Education and Practice Isolation | 57 |
| 2.4.2. Design Process Limited Understanding as a Functional Need | 58 |
| 2.4.3. The Lack of Design Decision Skills Independence in Design Studios.. | 59 |
| III. SOLUTION APPROACH | 60 |
| 3.1. REFLECTION AND EXPERIENCE AS LEARNING THEORIES..... | 63 |
| 3.1.1. Reflection and Learning..... | 63 |
| 3.1.2. Experience and learning..... | 66 |
| 3.2. REFLECTION AND EXPERIENCE LEARNING THEORIES IN DESIGN STUDIO | 67 |
| 3.2.1. Emotional Experience Learning | 68 |
| 3.2.2. Meaningful Learning | 68 |
| 3.2.3. Deep Understanding..... | 68 |
| 3.2.4. Collaborative Learning | 69 |
| 3.2.5. Breaking the Isolation | 69 |
| 3.2.6. Using Innovative Learning Tools | 70 |
| 3.3. ALTERNATIVE LEARNING TOOL IN DESIGN STUDIO: STORYTELLING..... | 71 |
| 3.4. STORYTELLING: THE (WOW) FACTOR CREATOR IN DESIGN STUDIO..... | 74 |
| 3.5. STORY STRUCTURE | 75 |
| 3.6. STORYTELLING USAGE..... | 76 |
| 3.6.1. Reflection and Experience learning Strategy..... | 76 |
| 3.6.2. Deep Understanding and Meaningful Learning..... | 76 |
| 3.6.3. Method of Teaching | 77 |
| 3.6.4. Tools Encouraging Active Imagination | 77 |
| 3.6.5. Emotional Audience Connection | 78 |
| 3.6.6. Tool in Design Thinking Process..... | 79 |
| 3.6.7. Presentation and Selling Strategies | 81 |
| 3.7. STORYTELLING UNIQUE CHARACTERISTICS..... | 82 |

| | |
|--|-----------|
| 3.7.1. Storytelling is Enjoyable..... | 82 |
| 3.7.2. Stories Solidify Abstract Concepts and Simplify Complex Messages .. | 82 |
| 3.7.3. Storytelling is Creative | 82 |
| 3.7.4. Storytelling is Responsive and an Active Process | 82 |
| 3.7.5. Storytelling is Inclusive and Flexible | 83 |
| 3.7.6. Storytelling is an Emotional Event | 84 |
| 3.7.7. Storytelling is Transformative | 84 |
| IV. CASE STUDY: DESIGN STUDIO | 86 |
| 4.1. DEFINITIONS AND FACTORS OF EXPERIMENT | 86 |
| 4.1.1. Observation Related Definitions..... | 86 |
| 4.1.2. Observation Factors | 89 |
| 4.1.3. Applying Storytelling Related Definitions | 94 |
| 4.1.4. Applying Storytelling Factors..... | 107 |
| 4.2. EXPERIMENT PHASE ONE: OBSERVATION DATA | 121 |
| 4.2.1. Design Studio Learning Environment | 121 |
| 4.2.2. Student Design Skills | 133 |
| 4.2.3. Questionnaire Analysis and Finding..... | 144 |
| 4.3. EXPERIMENT PHASE TWO: APPLYING STORYTELLING | 147 |
| 4.3.1. Week 01: Meeting Everyone | 149 |
| 4.3.2. Week 02: Heated Discussions and Evaluation of Skills | 150 |
| 4.3.3. Week 03: Journey Begins: Site Visits and Creating New Memories .. | 152 |
| 4.3.4. Week 04: Story Finding: More Analysis, Research and Digging..... | 155 |
| 4.3.5. Week 05: Becoming Storytellers and Expanding Story Horizons..... | 158 |
| 4.3.6. Week 06: What Comes Next is Going to be Tough..... | 160 |
| 4.3.7. Week 07: What if? Explain, Please! | 162 |
| 4.3.8. Week 08: Putting All Things Together: Conceptual Design | 164 |
| 4.3.9. Weeks 09, 10, and 11: She Keeps Asking “Why?!” | 165 |
| 4.3.10. Weeks 12, 13, 14, and 15: Design Development..... | 167 |
| 4.3.11. Final Evaluation | 167 |
| 4.4. QUESTIONNAIRES ANALYSIS AND FINDINGS | 169 |
| 4.4.1. Questionnaire 01: Design Exam Evaluation (Before) | 169 |

| | |
|---|-----|
| 4.4.2. Questionnaire 02: Jurors Feedback | 172 |
| 4.4.3. Questionnaire 03: Students Feedback after applying Storytelling..... | 174 |
| V. EXPERIMENT FINDINGS AND RESULTS..... | 177 |
| 5.1. UNDERSTANDING OF DESIGN PROCESS | 179 |
| 5.2. CRITICAL THINKING | 182 |
| 5.3. CREATIVITY IN CONCEPT FINDING | 183 |
| 5.4. INDEPENDENT THINKING AND DESIGN DECISION MAKING | 186 |
| 5.5. ABILITY OF TRANSFORMING INFORMATION | 187 |
| 5.6. STUDENT DESIGN CULTURE & EMOTIONAL CONNECTION WITH DESIGN..... | 189 |
| DISCUSSION | 192 |
| CONCLUSION AND RECOMMENDATIONS | 202 |
| REFERENCES | 208 |
| APPENDIX..... | 219 |

LIST OF TABLES

| | | |
|--------------|--|-----|
| Table I.1. | Research Questions | 15 |
| Table II.1. | Practice and design studio architecture design process differences | 50 |
| Table IV.1. | Questionnaire 01: Sketch Design Exam Evaluation | 91 |
| Table IV.2. | First 8 Weeks- Design Studio Course for Spring 2017..... | 109 |
| Table IV.3. | Last 7 Weeks-Design Studio Course for Spring 2017 | 110 |
| Table IV.4. | Questionnaire 01: Sketch Design Exam Evaluation | 114 |
| Table IV.5. | Questionnaire 02: Jurors Feedback | 114 |
| Table IV.6. | Questionnaire 03: Students Feedback after Applying Storytelling..... | 115 |
| Table IV.7. | Summary of Observation Data Analysis..... | 143 |
| Table IV.8. | Questionnaire 01: Design Exam Evaluation Findings | 145 |
| Table IV.10. | Questionnaire 01: Design Exam Evaluation (Before) Results..... | 170 |
| Table IV.11. | Questionnaire 02: Jurors Feedback Findings | 173 |
| Table IV.12. | Questionnaire 03: Students Feedback After Applying Storytelling Results..... | 175 |
| Table V.1. | Findings Changes Comparison | 191 |
| Table 0.1 | Summary of activities differences between conventional class and the experiment class in the first 8 weeks..... | 199 |

LIST OF FIGURES

| | | |
|---------------|--|-----|
| Figure I.1. | Research Methodology Diagram | 18 |
| Figure II.1. | Design Process Phases in Architecture and Interior Design | 46 |
| Figure IV.1. | Videos of Design Studio 01 Jury- Okan University | 93 |
| Figure IV.2. | Work Samples - Architecture Department – Okan University | 93 |
| Figure IV.3. | Attending Design Classes in Okan University and Taking Notes by Researcher..... | 93 |
| Figure IV.4. | Design Process Before and After Adding Storytelling as a Design Tool..... | 105 |
| Figure IV.5. | Storytelling Five Stages to Create Project Concept..... | 106 |
| Figure IV.6. | Styles of knowledge acquiring and transferring and roles of students and studio-instructor in the studio. (Kahvecioğlu, 2007, p. 20) | 123 |
| Figure IV.7. | Group discussion_ Design Studio 01 | 124 |
| Figure IV.8. | One to one Feedback _Design Studio 03..... | 124 |
| Figure IV.9. | Different projects Midterm presentation _Design Studio 03 - Architecture Department – Okan University | 126 |
| Figure IV.10. | Using computer _Design Studio 03 Architecture Department – Okan University | 127 |
| Figure IV.11. | Computing in Design Studios - Okan University | 128 |
| Figure IV.12. | Manual Conceptual Sketch in Design Studio 03_ Architecture Department – Okan University | 129 |

| | | |
|---------------|---|-----|
| Figure IV.13. | Different types of 3D modeling techniques in design studio 03 – Okan University | 130 |
| Figure IV.14. | Manual drawing of plan and 3D virtual model in Design Studio 03 - Architecture Department – Okan University | 132 |
| Figure IV.15. | Printed plans and 3D images in Design Studio 03 – Architecture Department – Okan University | 132 |
| Figure IV.16. | Digital Images_ no printout_ Design Studio 03 Architecture Department – Okan University | 132 |
| Figure IV.17. | Problem Solving _Design Studio 03 - Architecture Department – Okan University | 139 |
| Figure IV.18. | Questionnaire 01 Diagram Analysis | 144 |
| Figure IV.19. | Storytelling Application Methodology in Design Studio (04) Diagram..... | 148 |
| Figure IV.20. | Questionnaire 02: Design Final Jurors Feedback Diagram Analysis..... | 172 |
| Figure IV.21. | Questionnaire 03: Students Feedback on Applying Storytelling in Design Class Analysis Diagram | 174 |
| Figure V.1. | Improvement and Evaluation Factors | 177 |
| Figure V.2 | Connection of Research Design Studio Challenges Points with Improvement strategies and Factors to Evaluation | 178 |
| Figure V.3. | Design Process Phases Order..... | 179 |
| Figure V.4. | Information Analysis benefits..... | 179 |
| Figure V.5. | Starting with Project Related Ideas..... | 180 |
| Figure V.6. | Enhancement of Creative Critical Thinking | 183 |

| | | |
|--------------|---|-----|
| Figure V.7. | Inspiration References | 184 |
| Figure V.8. | Thinking Outside of The Box | 185 |
| Figure V.9. | Originality of Concepts..... | 185 |
| Figure V.10. | Concept Selection Process | 186 |
| Figure V.11. | Strong Decision Making | 186 |
| Figure V.12. | Coherent Manner Throughout Design Process | 188 |
| Figure V.13. | Successful Transformation of Concept Between phases | 188 |
| Figure V.14. | Student Design Culture Reflection | 189 |
| Figure V.15. | Student Emotional Connection with Design..... | 190 |

I. INTRODUCTION

Architecture as a study is different than architecture as a profession. While at universities it's considered an art related field, in practice it is treated as a technical profession. Both are right but focusing on one part without considering the other creates a gap. In the past, there was a balance between practice and education but in recent years, especially after 1900 the problem started to appear. Several scholars tried to address the problem from different theoretical, historical and cultural angles, but in this study the researcher addresses a new related symptom which is (the decision making in design process). To address the problem, the researcher believes that the problem starts in the first stages of design education. Therefore, she will go back to the beginning of architectural learning in design studio classes and examine the problem.

An introduction to understand the problem would be best addressed by going back in history and define learning in higher education and the different approaches considered by different scholars and institutions to investigate its qualities. To start fresh, the researcher starts with understanding learning in reference to other definitions about different educational and philosophical approaches. Later she explored learning in reference to conceptual approaches. Then she learns about the modern approaches where individuality, feedback and self-contribution is a major part in learning.

After exploring the many definitions of learning in higher education, the researcher tries to focus more on the architectural learning as the core of this study. Learning so, it helped the researcher explore the two major learning development

stages in which architectural learning was part of the profession in practice only until becoming a pure academic field where students learn theories then practice architecture in firms. Later the researcher explores the new model of learning architecture in universities.

After exploring architecture development process in higher education, the research digs deeper into the skills that make an architect who designs and contributes to the society and aesthetics of the surroundings. By introducing different studies and statistics, the researcher finds out the design excellence skills is what attracts firms proving that the personal design excellence of the graduate students guarantees them a job much easier than those who lack it and only knows soft wares and digital programs.

However, design skills learning has challenges. The researcher explores these challenges and come up with two major parts that define the meaning of being a design skilled architect: (1) Designer Culture, (2) Design Process. The researcher then explores more into design culture and its definitions and sources followed by examples and citations from different scholars until she reaches the four main standard sources to defining and judging a design culture.

The researcher explores how a designer background (religious, cultural, traditional, political, ethnic ...etc) becomes a source of their design culture. Moreover, the researcher explains the importance of the design process (from an idea to a physical building) in each project. Designing without following a process will create difficulties in producing a successful solution. Therefore, by following a specific design process

the architect can be more skilled to deal with the different design factors that come up in every stage.

After exploring the importance of architecture design excellence skills components and importance, the researcher suggests that when designer culture and design process work together, they will result in a better decision making which will lead to a better project design. This is to emphasize that the decision making is as strong as any other factor when defining an architect. The total understanding of decision making (as per the researcher) is the result of a well-rounded learning skill the students acquire in design studio classes.

After explaining in previous section about how important decision making which takes place in the first time in design studio classes, the researcher then addresses the importance and uniqueness of the design studio as a learning environment in which most of the design excellence skills are learnt. Then the researcher digs deeper into three different types of these learning environments theories. The purpose of this section is to show how unique this learning environment is and to prepare for the next sections where she discusses the pedagogy of design studios and its uniqueness as well.

After introducing design studio as a unique learning environment, the researcher attempts to explain the causes of the problem in this thesis for the first time which she believes that design studio is the very first start of it. She begins with historical references explaining how traditional and unquestionable the design studio teaching is and how it affects the learning curves of the lecturers and in return it affects the students. Later she begins citing major arguments about the problems in teaching by which she

explains the gap between what students learn in design studio and what they encounter in real practice. And finally, she starts pointing out specific shortcomings in the design studio with deep explanation of how each shortcoming help escalate the problem and widen the gap.

The primary disconnection and confusion in design process understanding starts when students learn how to artistically create designs rather than learning how to solve problems. The researcher believes that given the current situation in the market, it's very important to point out that when we graduate students that lack the ability to fill the practice needs, we bring more problems to the industry and therefore the gap becomes bigger. Furthermore, the researcher references a few sentences explaining how the problem is becoming bigger when we produce scholars who have no practical experience and give them the opportunity to teach in schools as they will teach more theory and art rather than problem solving and so on.

Another problem the students will fall into is that they start their designs with no clear understanding of the project brief. Therefore, and without addressing the important problems within the project design, the outcome of the project will not match the requirements. This problem is very important to point out as the students after graduation will be encountering in practice.

Another major problem is that students lack the means of representation language of their design. This lack of representation can be found in three symptoms either when students get stuck with one language and doesn't improve it or when they have no language at all to present or when they do have a language, but they don't know how

to control it. The researcher suggests that these problems are the result of the separation of design and construction in teaching of architecture.

Previously, the researcher has come to an understanding of the major causes of the shortcomings that design studio encounters. The main reasons can be summarized in the three major points: (1) The Isolation between architectural education in design studio and architectural practice, (2) The Limited Understanding of Design Process as a Functional Needs rather Creative Problem Solving and , (3) the Lack of Design Decision Skills Independency in Design Studios. To be able to deal with the above concepts of improving students design excellence skills, the researcher has crossed referenced alternative learning theory that combines all the three concepts above in one approach that focusses directly on the design studio.

As teaching in higher education becomes more independent, the most two facets – purpose and methodology – has changed significantly and became transformative. Learning became how to make meaning of things. To improve student learning and make it more effective, teachers need to craft the curriculum and move it from the surface to the deep and find ways to invest in students desired goals in the design studios. Only by having specified the desired results can we focus on the content, methods, and activities most likely to achieve those results. Aside from focusing on the curriculum, teachers must enforce students to take part of the responsibility in how they learn and construct their knowledge. In this regard, the education system must prepare teachers in the first place who are qualified enough to produce graduates of higher education.

Many learning models were presented earlier that help teachers reach these goals. The researcher investigated different models of learning theory in higher education's faculties in recent years to find what can be used to enhance student knowledge and understanding in architecture design skills learning : (1) Constructive Learning as a theory of knowledge that argues that humans generate knowledge and meaning from an interaction between their experiences and their ideas (Wikipedia, 2016), (2) Experiential Learning which addresses the process of learning through experience (Fry, Ketteridge, & Marshall, 2003, p. 14) and , (3) Reflective Learning which allows students to step back from their learning experience to help them develop critical thinking skills and improve on future performance by analyzing their experience. In other words, as John Dewey (1933) explains its learning by thinking.

Most of the current student learning theories in higher education focus on using Experiential and Reflection learning theories. (Fry, Ketteridge, & Marshall, 2003, pp. 10-11) The learning theories which the researcher has adopted in this research were (reflection and experiential) learning theories. The researcher suggests a framework to apply this learning theory within the design studio learning environment and as a design tool to improve students design skills. The researcher then explores the many aspects of these two theories as explained and elaborated by modern scholars as we will see in Palmers's views about education and what it deals with as he suggested that students are not the same and each student has their own way of learning and hence teachers must understand students' backgrounds and desires and encourage them to learn about themselves and their areas of study by engaging in reflective activities around them.

Another point of view in the matter that was investigated by the researcher is Polanyi's attempts on how to capture students' underlying knowledge in which he found ways of reducing the gap between students' background references and current teaching models.

After thorough investigations, the researcher elaborates on the reflection learning theories and presents reflection learning concepts definitions according to Moon (1999), Boyd and Fales (1983), Kemmis (1985). Having understood these definitions, the researcher studied the common points and features in the process of reflection learning; and again, listed the point of views of the previously mentioned scholars about the topic. Reflective process work on different levels but according to the readings, most authors agree on reflection is perceived in three stages; one that is characterized by the student inner discomfort, another is the experience of surprise and finally a perspective transformation. "These three stages are integrated, and the outcome of such reflection is learning, and it is a social process; reflective processes become more productive when others are involved, and maintains that questioning is central to productive reflection" (McDrury & Alterio, 2003, p. 23).

Learning about reflective learning concepts and process was not enough, therefore, the researcher reached a point where she needed to link what she learned about reflective learning as an activity to the forms of technical, practical and critical thinking she wanted explore in the first place. This led the researcher to an understanding how each form of thinking is affected within the teaching process and later prepared for the exploration of experiential learning and its relationship with the reflective learning.

As the links between experiential and reflective learning were clearly identified, the researcher studies Kolb's experiential learning stages to find out that for meaningful learning to take place the student must reflect on experience, generalize the experience to other situations, decide how to translate learning into action, then evaluate the outcome of that action. To be diversative, and in addition to Kolb's, another study was conducted in which experience learning propositions were identified and elaborated in reference to Boud, Cohen and Walker (1993). All together, these studies and understandings paved the ground for the researcher to clearly explain why she chose to combine experiential and reflective theories in overcoming the shortcomings in design studio. She thoroughly expressed her interest in this approach as she moved toward the mechanism of implementing reflective and experiential learning in design studios.

According to (Heick, 2018), applying reflective and experience learning must deal with many activities which requires the implementation of different strategies. The researcher learned these strategies and came with a conclusion that sums up these strategies in five main ones: (1) Verbal Reflection, (2) Journals, (3) Essays, (4) Directed Writing, (5) Research Papers. These five strategies can provide students with persistent method of approaching their experience and translating them on their design work and learning curve.

Having learned the strategies used to apply reflective and experience learning in design studio, the researcher then expands this knowledge and studied the outcome of

this application. Although the outcomes she explored vary in weight and effect, she summarized these outcomes into six major features:

- 1) Efficient Learning,
- 2) Meaningful Learning,
- 3) Deep Understanding,
- 4) Collaborative Learning,
- 5) Breaking the Isolation, and finally
- 6) New Learning Tools

These outcomes not only they ensure the development of students' learning curves but also prepares the students to be collaborative within the class and with their classmates.

The journey that the researcher took into reflective and experience learning strategies and outcomes in the design studio was an important step to understand how this research will evolve. Not only it meets the researcher perspective but also it suggests the core solution on how to improve student design skills. Moreover, it shaped most of the coming chapters as the researcher has come closer to finding an alternative learning tool that can be used to achieve the goals of this study. As a professional architect and a design studio teacher herself, the researcher had always been curious toward how to form a creative design solution that can be learned, trained, executed in design classes and marketed by the designers to their clients. Many scholars influenced her through her professional experience, but the one she kept remembering is her

teacher's words: "Telling something" when you design. And this was the first spark in finding an alternative tool.

To tell something is all about experience and how to reflect this experience on one's designs. It lead to a passionate designing experience and deep understanding of the design process as "gathering of knowledge from experience depends on narrative representation for its comprehension" (Grillner, 2000, p. 214) The curious narrative that students can include in what they design will create the Wow factor by which they sell their ideas. The factor that construct a personal identity and unique characteristic for each project. And this is exactly what the researcher aims to achieve in this sense. A new and alternative tool that can be added to the previous list of reflection and experience strategies; The new tool is here "Storytelling".

Storytelling as a term is self-explanatory, but in the creative industry it possesses different levels and approaches. The researcher main goal in the following is to explore this term's definitions and characteristics and how a good story can be structured in design expertise to be used through reflection and experience. The researcher starts with redefining the role of architects in the industry and how they try to overcome all the difficulties by going beyond representation to reach the essence of architecture. Unlike professional architects, students stick to the representation of what they are taught and get obliged to follow codes until their imagination becomes passive in what they design and the language of architecture they possess is only represented in image. (Corona-Martínez & Quantrill, 2003, p. 36) The researcher here proposes that one way for students to overcome this difficulty is to learn Storytelling as a reflective skill.

According to (McDrury & Alterio, 2003, p. 8), many scholars previously discussed Storytelling as a learning tool and how it became accepted in medical schools in higher education to stimulate students critical thinking skills and to encourage self-review. Given the experience provided above, the researcher aims to use the same experience in architecture with modification to fit the creative industry. She builds her hypothesis on the premise that a new design tool can be added, modified to create new structures for a learning experience in design studio class based on (why? when? And how?).

While defining Storytelling is important to the reader, the researcher expanded these definitions to explore the unique characteristics of this term. She thoroughly explains how Storytelling is enjoyable, creative, responsive, active, inclusive, flexible, emotional and transformative; giving each characteristic a clear elaboration and description, later she follows (Bu., 2017) in defining the structure of a story, explaining the five main parts of it and connect these parts to the design studio class giving each term a unique reference in architecture learning. Storytelling goes beyond the obvious term definition. The researcher explores the many usages in which storytelling can play a great role and make a difference in the learning sector.

Storytelling as an alternative design tool is now introduced. The researcher prepares to implement her theory in a live experiment where she will examine each aspect of this theory to ensure its validity. In this regard, the next chapters will address the experiment that was held at the architectural faculty in Okan university.

1.1. Aims and Objectives

This research examines the effect of adding storytelling as a learning tool in design studios. It is directed toward design classes as an attempt to overcome some of the current learning issues facing architecture schools in design teaching. The researcher believes that this tool will help students achieve uniqueness in concept finding, become creative problem solvers and help them learn how to become independent decision makers through the design process with clear understanding of the how and why. Moreover, it is conducted to help students learn how to build and sell their ideas and be prepared for the market industry.

The two major aims of this research are directed in the general area of architectural education, specifically:

- Developing an "interactive" learning strategy in design studio environment.
- Developing an “alternative” design tool within the project design process.

Since the subject of architectural design teaching and learning in design studio, the objectives of this research could include various related issues. However, the specific objectives related to the described aims of this research could be outlined as the followings:

- To investigate and review the background of student learning education and what related to design education. (This could be accomplished through literature reviews and enquiries),

- To develop a teaching model for the design process based on Storytelling technique. (This could be accomplished through analyzing the findings and examining the results in the form of a case study and to come up with a criteria).
- To investigate about adding storytelling within design process affects creative thinking and the critical thinking process during the design. (This could be accomplished through literature review and enquiries, i.e., interviews),
- To investigate and review the views architectural educators/students of using storytelling in architectural design process teaching / learning in design studio. (This could be accomplished through literature review and enquiries, i.e., questionnaires)

1.2. Questions and Hypothesis

The researcher of this study was interested in knowing how learning design skills and through storytelling in one of design studios classes in Okan University, as implemented by the researcher, could first, help the student to really understand the importance of design process , and secondly, by using storytelling within the design process, it will motivate student's design decision making with a creativity approach. All assumptions, prescriptions, and explanations were directed towards achieving this goal.

This research model includes a main question: How to assets students of architecture in design studio classes to be better in Design skills and be more creative? This question is followed by a small number of sub-questions. that deal with the

shortcomings and challenges of learning design skills in design studio. The grand tour question is a statement of the problem that is examined in the study in its broadest form, posed as a general issue, so as not to limit the inquiry. The sub-questions are used as guides for the methodology and methods used to enable the researcher to answer the broad-based grand tour question. Having answered the sub-questions, the researcher believes that the main question will be answered accordingly.

The researcher hypothesis relies on qualitative method. Hence, results must rely on the human factor of evaluation and analysis. Does applying storytelling as a learning tool in design studio class will improve any of the following design skills?

- Help students to gain better design skills and understanding of design process across the disciplines of design studio classes?
- Benefit student's critical thinking for unique design concepts and problem solving?
- Stronger transferability of accumulated knowledge for good future professional development?

Table I.1. Research Questions

| | |
|-----------------|--|
| Question One: | Is there a gap or a problem between the academic and professional sector? |
| | What caused this gap or problem? |
| | What are the symptoms of this gap? |
| | What skills student need to learn and where do they learn them? |
| Question Two: | What are the shortcomings in design studio class as a unique learning environment? |
| | What are the challenges of learning design skills in design studio? |
| | How the isolation between architectural education in design studio and professional practice helped in widening the gap? |
| | How the limited understanding of design process as a fictional need rather creative problem solving helped in widening the gap? |
| | How the lack of design skills independency in design studio helped in widening the gap? |
| | How to overcome these shortcomings of learning design skills excellence in design studio? |
| Question Three: | What proposed teaching tools by the researcher can help architect student in design studio to be more creative and confident in their designs? |
| | What learning theories are currently in use? |
| | What is “storytelling” in education? |
| | How Storytelling as a learning tool works in design studio? |
| | How to implement “storytelling” in design studio classes? |
| | when to implement “storytelling” in the design process? |
| Question Four: | Did applying storytelling in design studio improved the learning experience for the student? |
| | Did storytelling help in improving students design skills? |
| | How does implementing storytelling in design studio contribute to its student’s design process understanding? |
| | How does implementing storytelling in design process contribute to its student’s design decision and design confident? |

1.3. Research Paradigm

The basic beliefs that define this paradigm constitute the researcher's assumptions concerning her ontological, epistemological, a methodological position, which should be accepted on faith. Here, those beliefs are:

- An ontological position that views reality to exist in a realistic ecological world that is composed of several human and non-human components. In this study, Design Studio environment, objects, Students' actions and learning are main components of this.
- An epistemology that consists of occurring cognitive and activity processes through which objects and features of design studio environment guide students' actions and learning and promote their motives. The gained knowledge is expected to be contextual in nature.
- A methodology that allows knowledge to accumulate along a mediated pathway that links design studio environment to its students' motives and purposes. Methods adopted should be able to describe the features of the design studio settings environment, make one understand students' learning and motives, and be able to help students achieve better learning of design skills

1.4. Research Methodology

the researcher discusses the methodology used in this study. She forwards an explanation of her understanding of qualitative research methodology followed by her understanding of the action research and reflection, and a justification for using them. The researcher then describes the study site and participants in details and give reasoning and purpose behind the selections. Later, she discusses the methods used in this research. Her intentions are to describe methods of collecting data and data analysis and discuss their advantages and disadvantages. The most telling developments in her study can be perceived through her experience and reflections as well as those of her students while learning design skills in a design studio class.

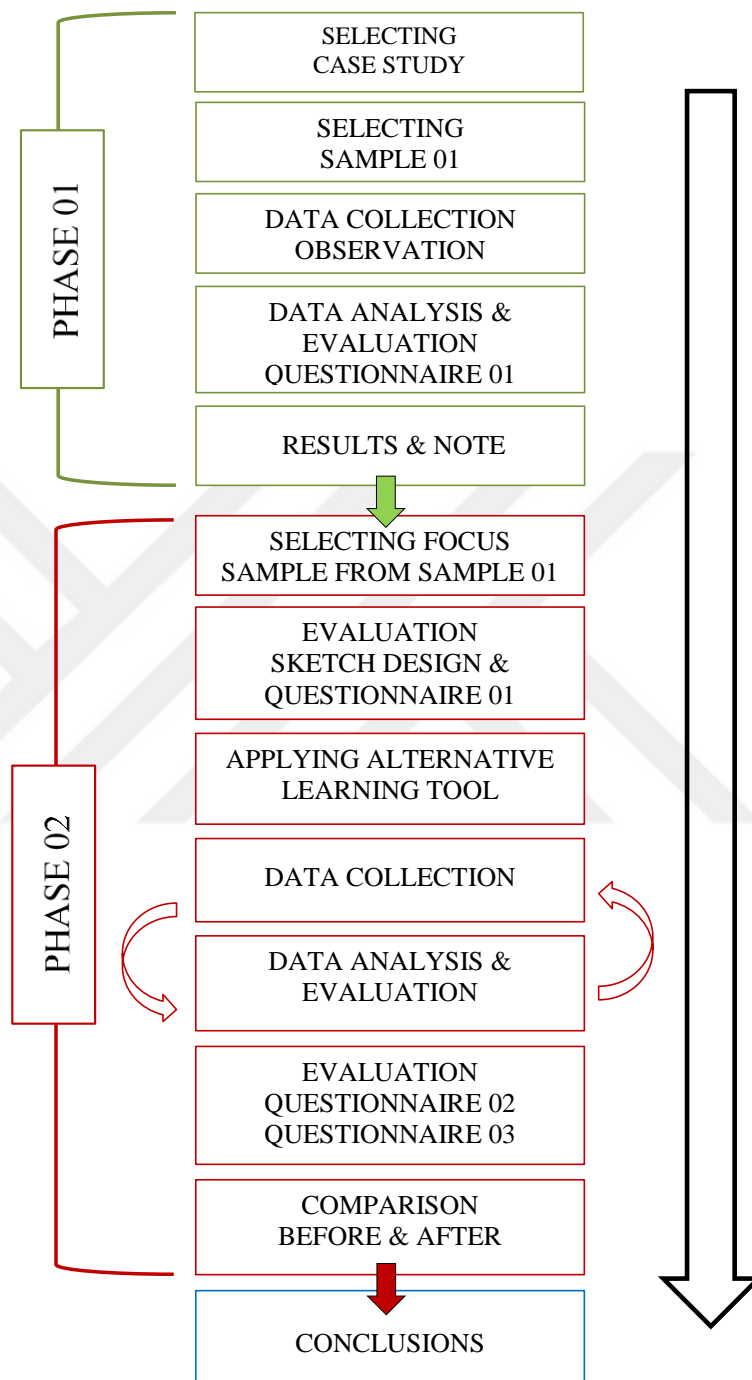


Figure I.1. Research Methodology Diagram

1.4.1. Qualitative Research

This is research follows qualitative methods. The purpose of following a qualitative research expresses the assumptions of the researcher in attempting to understand and interpret students' experiences and learning curves in design studio class.

Thinking qualitatively for the purpose of answering the research questions involved thinking about the most appropriate methods and sources for collecting data and research design that is described by Denzin and Lincoln (2003. p .36) as: "*...A research design describes a flexible set of guidelines that connect theoretical paradigms first to strategies of inquiry and second to methods for collecting empirical material. A research design situates researchers in the empirical world and connects them to specific sites, persons, groups, institutions, and bodies of relative, interpretive materials, including documents and archives*".

Data collection techniques are selected, depending on the choice of design, the nature of the respondents and the research problem. They included interviews, observations, visual aids, personal and official documents, photographs, drawings, videos, informal conversations, formal conversations, questionnaires and artifacts.

“Qualitative research, findings are not arrived at by statistical methods or other procedures of quantification, and it is quite common for researchers to collect their data through observation and interviews. Qualitative methods are flexible and unstructured as compared to quantitative ones. They employ a limited number of observations and try to explain different aspects of the problem era. The research may code the data

collected in such a manner that it would allow statistical analysis. it is quite possible to quantify qualitative data. Qualitative and quantitative methods are therefore not mutually exclusive. The differences in the emphasis between qualitative and quantitative methods” (Saeid, 2001, p. 5)

The research, due to the nature of its questions and aims of the research - which are related to informal observations of students' performances - can be categorized as a qualitative approach which involves human performance in an educational experience. It will involve informal unstructured interviews, questionnaires, and observations.

The researcher gathers most of the data in recognition of the assumption about the subjective nature of the research. Data collection in this sense requires access to the study site. Access and entry to the study site are important and sensitive issues that was addressed to the university for which they granted a generous access to design studio students and classes. Through this access to the site, the researcher established a rapport and authentic communication patterns with the students so that you she can capture the subtle nuances of meaning from their voices.

1.4.2. Phenomenology

Phenomenology is a method for approaching concretely lived existence, to inquiry into the logic of essences and meanings, with deep psychological description of consciousness without presuppositions (Thévenaz , 1962, p. 37) phenomenology is built on basic concepts developed by three of 20th century phenomenology: Edmund Husserl, Martin Heidegger, and Maurice Merleau-Ponty. (Curran & Kearney, 2012) As

the researcher is interested in studying an actual learning environment which is an architect design studio and to understand its present circumstances as it is and how students interreact in it; phenomenology as a research theory is used to conduct the first phase of the research data collection by observing and documenting without interfering.

1.4.3. Action Research

The methodology of this research, due to its educational context involves Action Research in the second phase of the research. Application of action research could help the Author to develop an appropriate teaching method for design education, improve learning strategies for students, evaluate educational procedures in the design process, improve students' attitudes to work, and improve teaching skills in design.

Dick (URL-O, 1999) describes an Action research as a family of research methodologies which pursue action (or change) and research (or understanding) at the same time. He suggests that two major characteristics of an action research are:

- Using a cycle or spiral process which alternates between action and critical reflection, and in the later cycles, continuously refining methods, data and interpretation in the light of the understanding developed in the earlier cycles. “It is an interactive process which converges towards a better understanding of "what" happens. In most of its forms it is also participatory and qualitative.” (Saeid, 2001, p. 5)
- “Action research is situational - it is concerned with diagnosing a problem in a specific context and attempting to solve it in that context.” “It is usually

collaborative, participatory and it is self-evaluative - modifications are continuously evaluated within the ongoing situation, the ultimate objective being to improve practice in some way or other.” (Fry, Ketteridge, & Marshall, 2003, p. 11)

“Action research has been mostly used in social studies and education. Kemmis and McTaggret (1998) define it as a form of collective self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices.” According to Gill and Johnson (1997)“This approach to research design involves a planned intervention by a researcher, or more often a consultant, into some naturally occurring events.” (Saeid, 2001, p. 8)

Some areas in school life where action research could be used are: Teaching methods, Learning strategies, Evaluative procedures, Attitudes and values, In-service development of teachers, Management and control, Administration (Cohen and Manion, 1994, p. 194).

1.5. Methods of Data Collection

Although quantitative method was applied in some parts of the data collection such as in questionnaire, qualitative method was the dominant method that was used in most of the data collection and experiment.

1.5.1. Guidelines

The design studio classes contain countless variables to investigate, “For instance, diverse student interests, developmental levels, large classes, and previous achievements (Wiggins & McTighe, 2005, p. 14)” has to be taken into consideration. Moreover, the researcher will have to observe “what instructors do directly for students in their classes (Stake & Cisneros-Cohernour, 2000, p. 63)”.

In order to manage and control the quality and quantity of the incoming observations and be able to store each properly, the researcher proposes an internationally recognized guideline for Data Collection. The guideline is known as ““Three Stages Guidelines: The Backward Design” approach (Wiggins & McTighe, 2005, pp. 14-19). “There are different models of learning that teachers need to be aware of. What we do as teachers must take into account what we know about how students learn” (Fry, Ketteridge, & Marshall, 2003, p. 23). Designing the learning activities, assignments, and assessments framework should identify teaching and learning priorities and constrains. This can be achieved by collecting standard data that specify what students should know and be able to do. “The challenge is to focus first on the desired learning from which appropriate teaching will logically follow. Only by having specified the desired results can we focus on the content, methods, and activities most likely to achieve those results” (Wiggins & McTighe, 2005, pp. 14-15). These procedures of backward design are divided into three looped stages:

- Stage 1: Identify Desired Results

In this stage, the researcher refers to data collection as the base criteria toward the identification of the desired results expected to be given to students, i.e., “what should students know, understand, and be able to do, what content is worthy of understanding and what enduring understandings are desired?” In addition, this stage is required to retrieve data about the given curriculum in the class and how teachers are performing accordingly.

- Stage 2: Determine Acceptable Evidence

In reference to stage one data collection, the researcher will follow stage 2 guidance to learn if students have achieved the desired results collected in Stage 1 and then decide on accepting the analyzed data as evidence of student understanding and proficiency. “The backward design orientation suggests that we think about a unit or course in terms of the collected assessment evidence needed to document and validate that the desired learning has been achieved, not simply as content to be covered or as a series of learning activities. This approach encourages teachers and curriculum planners to first “think like an assessor” before designing specific units and lessons, and thus to consider up front how they will determine if students have attained the desired understandings.

- Stage 3: Plan Learning Experiences and Instruction

With clearly identified results and appropriate evidence of understanding in mind, it is now the time to fully think through the most appropriate instructional activities. Several key questions must be considered by the researcher at this stage of backward design, i.e., What enabling knowledge (facts, concepts, principles) and skills

(processes, procedures, strategies) will students need in order to perform effectively and achieve desired results? What activities will equip students with the needed knowledge and skills? What will need to be taught and coached, and how should it best be taught, considering performance goals? What materials and resources are best suited to accomplish these goals?”

The objective of this phase is to detect if there is shortcoming and Challenges of learning Design Excellent Skills in design Studios at Okan university as a case study for this research. This will be done by observing a sample of students in design studios in the present time.

1.5.2. Design as a Research Tool

In academic institutions the term “research” has a clear signification as scientific Research. But, In architectural practice and teaching there has always been a part of experimental work, not linked to a precise task, a defined client and strict contextual constraints which was also called Design Research (Niklaus Kohler, 2000, p. 272). Design Research involves: Looking, Learning, Asking, Making, Testing, Evaluating & Selecting, and Communicating; and it can be divided into two forms: primary and secondary research. Secondary research involves the summary, collation and/or synthesis of existing research. Primary research involves the design researcher undertaking original research to collect new data through a range of methods and experiments (Niklaus Kohler, 2000).

The collect new data can be in two forms, either by “valuations of teaching dossiers or portfolios. “The teaching portfolio, which been adapted from such fields as art and architecture, in which professionals display samples of their work for clients or employers; Products of good teaching such as student workbooks, completed assignments, and pre- and post-examination results. (Centra, 2000, pp. 87-88)”. The other form (teacher dossiers) include course outlines, syllabi, teaching materials, student evaluations, and curriculum development documentation—much of what is generally prescribed for a teaching portfolio with the exception of teacher reflections and evidence of student learning.” (Centra, 2000, p. 89)

Or, refereeing to Edgerton, Hutchings, and Quinlan (1991) samples of students' work accompanied by any feedback from the teacher to the student (Centra, 2000, p. 88), in design research researcher may uses representative images, physical models and 3D prototypes and sketches of design development of thing done by students (Cowdroy, 2000, p. 25)

“Judgments of portfolios or self-reports could be made by colleagues (Centra, 2000, p. 88)”, designers and architecture professional personals. “The rich documentation a portfolio can contain provides the basis for making such judgments. Reliability of judgments or ratings, however, is a function not only of the information used but also the number of suitable raters. A single rater, whether an administrator or colleague, provides only a limited view, which can be biased or prejudicial. Additional raters generally provide a more balanced perspective.” (Centra, 2000, p. 88)“Teaching evaluation in higher education has evolved from a primary reliance on a chair's

assessment to a formal, systematic, and multiple approach, including a variety of methods like student ratings, peer reviews, peer visits, self-evaluations, document reviews, and evidence of achievement (Ory, 2000, p. 14).”

Given the fact that the researcher current experience covers both the architectural industry as an Architect and as a design teacher; let alone the academic research experience, the researcher will rely on their experience among many resources to help rationalize this study through a two-part work plan. While the first part answers the questions related to the theory of implementing storytelling in architectural education, the second part works as an attempt to confirm the above theory through applied experimentation. Upon agreement with Okan University, the researcher has conducted an in-class experiment at the university. The experiment was directly conducted with architectural design students. For the researcher to accommodate a proper academic experiment, current design classes data has been gathered prior the experiment by which the researcher would later utilize in accordance with the literature review to come up with the experiment criteria and design.

The researcher believes that it is in the education of architecture where the relationship among practice, research and experimentation is cemented. Hence, education of architecture must be structured properly to allow this parallel interaction (Niklaus Kohler, 2000, p. 272). Choosing to apply the theory of storytelling in architectural education through a field experiment is expected not only to confirm or decline the theory, but also to provide scholars with closer look on how architectural education performs in Okan University. While the main purpose of the research is to

find the new active techniques in architecture education design classes, the purpose of the above experiment is to base a ground on which storytelling plays an alternative teaching tool toward practice-based architectural education.

In the field of education, designing a teaching method is essential to enhance learning experiences and to meet specific purposes. The effectiveness of the proposed method design corresponds to whether students have accomplished the desired learning goals and making learning more effective (Wiggins & McTighe, 2005, p. 13) or more research in the field is still required. Of the many resources taken into consideration comes at the first the researcher ambition to pursue a degree in which Architecture is taught to be used in the creative industry. (Corona-Martínez & Quantrill, 2003, p. 170)

1.6. Research Data Collection Tools

Data in these two phases is collected within design studio classes in one-year period. These tools were applied in purpose to cover all student activities, progress, and outcomes. And to document the learning process in design studio classes. These tools are: (1) Interviews,(2) Notes,(3) Photography,(4) Videos,(5) Work Samples, (6) Questionnaire,(7) Written Description Reports, (8) Class Tutors feedback, (9) Students Notebook, (10) Tutor / juror Notebook, (11) Student progress report.

1.7. Limitation of the Study

This research will involve examining the methodology of the design process in architecture. It is directed toward architectural education, and so, it will review current educational issues facing architectural design studios. Since the research is limited only

to the subject of Architectural Design in a pedagogic perspective, it will concentrate about designing an architectural learning design tools which would best benefit educational programs. The researcher is concerned mostly with the importance of interactive education by storytelling as a major component of any architectural design skill learning.

Investigating storytelling as a learning tool in the area of design, requires an understanding about the design processes involved in design activities. Therefore, by reviewing the contributions of the psychological theories to design, the researcher will closely examine the implications of findings in metacognitive psychology for the proposed model of the design process. This will require some understanding about the way people think and the structure of the human brain for processing complex thinking tasks. This investigation, however, will be limited in the form of observation, by proposing an alternative design process and teaching strategy and observing students' accomplishments under the new model.

1.8. Research Summary

This research falls into six chapters as follows:

Chapter 1 – Introduction, is an introduction to the research that summarizes the researcher background and reasons of conducting this study in addition to all the steps taken in the literature review. It also elaborates on the research hypothesis, research objectives, research paradigm, basic assumptions and questions, strategy and design, limitations as well as the significance of the study.

Chapter 2 – Literature Review presents a literature review from the domain of architectural education as well as theories and concepts that help in building the logic of the research and from other current perspectives in the field. It also presents an in-depth elaboration on the design studio shortcomings and issues that the researcher took as a base to build their research basic questions.

Chapter 3 – Solution Approach is a literature review from the domain of current learning theories in higher education as well as tools and concepts that help in building the logic of the research to help to overcome design studio shortcomings and issues that the researcher took as a base to build their research basic solutions.

Chapter 4 – Case Study: Design Studio describes first describes the methods and sources of data collection, the environmental assessment technique to describe the educational environment of the study settings; conducting standardized questionnaires to reveal students' most dominant motives; and observing behaviors to note the standing patterns among them. Moreover, it describes the research conduction method and why these methods were adopted. After the workflow of data collection applying storytelling as a learning tool is the next step. It elaborates the current situation in design studio at Okan University using the methods and techniques discussed in previous chapters. The collected data is also analyzed in this chapter with detailed diagrams and graphics on how the researcher built her criteria to apply storytelling in the second phase. introduces Storytelling as an alternative design tool for design studios through an on-site experiment. It describes the timeline as the researcher applied this tool. In

addition, the collected data and out is analyzed in this chapter with detailed diagrams and graphics.

Chapter 5 – Experiment Findings and Results summarizes the findings of the study. It also concludes remarks, verification, and new directions for future studies in the area.

1.9. Previous Studies

Using reflective and experience as a learning theory in higher education facilities has been discussed and research before by scholars in the last decades. Storytelling as one of its strategies has been used as a learning tool in both elementary education like, kindergarten and first years in schools and higher education especially nursing faculties. As the researcher knowledge this is the first research about applying storytelling as a learning tool in architecture design studio and what effects does it have on student design skill learning. the motivation of this research is studying alternative learning tools to develop the learning environments, creativity, motivation and collaboration in architecture design studio.

The following are some previous studies that discussed storytelling as a learning tool:

- Book title: Learning through Storytelling in Higher Education: Using Reflection & Experience to Improve Learning, by Janice Mcdrury and Maxine Alterio, published in 2003

- Book title: Classroom Tales: Using Storytelling to Build Emotional, Social and Academic Skills across the Primary Curriculum, by Jennifer M. Fox Eades, published in 2006
- Book title: Narrative in Culture: The Uses of Storytelling in the Sciences, Philosophy, and Literature, by Cristopher Nash, published in 1994
- Book title: Think like an Architect. by Hal Box, published in 2007
- Book title: New Directions in Professional Higher Education. by Tom Bourner, Tim Katz and David Watson, published in 2000.
- Book title: Design and Emotion: The Experience of Everyday Things. by Deana McDonagh, Paul Hekkert, Jeroen Van Erp, and Diane Gyi , published 2004.
- Paper: A paradigm in architectural education: Kolb's Model and learning styles in studio pedagogy, by Sara Khorshidifard, published in 2011
- PhD Thesis: Creating Creativity in The Design Studio: Assessing the Impact of Metacognitive Skill Development on Creative Abilities, by Ryan Anthony Hargrove, published in 2007
- PhD Thesis: Storytelling Through Architecture, by Claire Nicole Wallace, 2007
- PhD Thesis: An Architecture Story Engaging Design Through Storytelling, by Chuen Ho Howard Shek, 2015
- PhD Thesis: The Design Process in Architecture A Pedagogic Approach Using Interactive Thinking, by Amir Saeid M. Mahmoodi, published 2001

- Journal: Design Studio Pedagogy: Horizons for The Future, by Ashraf M. Salama and Nicholas Wilkinson, published 2007
- Original Article: Where Is The ‘Problem’ In Design Studio: Purpose and Significance of the Design Task, by Beatriz C. Maturana, published 2014
- Original Article: Architectural Design Pedagogy: Improving Student Learning Outcomes, by Rokhshid Ghaziani, Azadeh Montazami and Frazer Bufton, published 2013
- Original Article: U-Director: A Decision-Theoretic Narrative Planning Architecture for Storytelling Environments, by Bradford W. Mott and James C. Lester,
- Original Article: Architectural design studio organization and creativity, by Nurbın Paker Kahvecioğlu, published in 2008
- Original Article: In search of a theoretical basis for storytelling in education research: story as method, by Kathleen Marie Gallagher, 2011
- Original Article: Storytelling: a teaching-learning technique, by Rene Geanellos ,1996
- Original Article: Tell me a Story: the use of narrative as a learning tool for natural selection, by Renate Prins, Lucy Avraamidou and Martin Goedhart, 2017

II. LITERATURE REVIEW

Broadly, architecture not only engenders people created spacing for specific uses but also creates lively public art (Jones, 1961, p. 1), evoking social, political, economic and cultural feelings, art, design, market, personal preferences, and demand. Communities band together to imagine and fabricate their surroundings (Wasserman, Sullivan, & Palermo, 2000, p. 15). However, institutions, including academia, erroneously negate socially derived aesthetics when reengineering. Thus, since actors fail to realize the designer's role in promoting a successful outcome, they often neglect architectural contributions to a project (Fisher, 2000, p. 9).

The technical rationality prevalent since the late 1900s has solved problems employing an elimination process— selecting the optimal solution from the rationally known choices (Piotrowski & Robinson, 2001, p. 270). Previously pundits imparted to interns the intricacies of managing a business and a project and detailing and constructing a building, concentrating on design, history, and theory. Currently, however, architecture professors academic, often lacking practical experience, convey architectural theories and design to students. Hence, novice architects cannot apply their education effectively when entering the professional world (Mccann, 2005, p. 69), especially as the design process increases in complexity (Box, 2007, p. 83). Many academic programs focus on technical and management skills, minimizing design skills and processes (Hargrove, 2007, p. 3). Therefore, since architectural schools maintain an academic bent (Piotrowski & Robinson, 2001, p. 4), prevailing design elements

perplex rookie architects (Box, 2007), unequipped to articulate their design actions (Wiggins G. E., 1989, p. 7).

Previous scholars have explored the gap between theory and design (Yeşilkaya, 2001, p. 149), theory and practice (Ioan, 2001, p. 144), the researcher postulated weak design skills might stem from the lack of exposure to decision making in design classes. The curriculum stifles creativity, promoting technical functionality in design tasks. Nevertheless, the lessons neglect learners justifying design decisions and choices to their professors or peers. Consequently, entrant architects lack decision-making skills (Martinez & Quantrill, 2003, pp. 26-27). Therefore, architecture programs must update their learning strategies to incorporate the new standards (Saeid, 2001, p. 1).

Basically, learning engenders studying, experiencing, and seeking instruction to attain knowledge or skills (Dictionary, 2019). But many mavens base the definition on philosophy (McGill & Brockbank, 2007, p. 17), resulting in several learning theories. As a person matures, learning encompasses more than knowledge acquisition (Yarbrough, 2018); for self-actualization goals may prompt a person to seek education, especially at a university (Carey, 2015).

Hence, postsecondary education constitutes individual and social motivations (Lowrie, 2018). Barnett (2005) stressed a learner knowing how to engage with the various discourses critically to understand the world, bringing prior learning experiences, perceptions, approaches, and outcomes to the present context (Prosser & Trigwell, 1999).

Knowledge, not cumulative and linear, epitomizes nesting, and interacting frameworks used to comprehend and guide actions (Barr & Tagg, 1995, p. 21; Lueth, 2008). According to Atkinson, Atkinson, Smith, Bem, and Nolen-Hoeksema (1996), learning involves practice or experience permanently altering behavior. Furthermore, Wilson (2002) described new topic learning requires the learner to suspend existing beliefs, address personal prejudices, and keep an open mind. This demand can promote excitement sparking potential discovery or can create a reluctance to initiate learning (Lueth, 2008, p. 34).

Architecture represents a discipline with a unique knowledge base since the nineteenth century when the apprenticeship-based learning structure moved instructional practices to the college classroom. Professors disseminate architectural paradigms instead of experts imparting information and philosophy, demonstrating embedded, practical, and integrated experiences. Even the student has changed from learning synthetic approaches from a knowledgeable individual to learning to synthesize a variety of knowledge from different perspectives and disciplines. (Piotrowski & Robinson, 2001, p. 61) Architectural learning has transformed into a scientifically critical analysis rather than historical interpretation (Yeşilkaya, 2001, p. 149), combining disciplines, like engineering, art, history, and the social sciences. (Piotrowski & Robinson, 2001, p. 61). Architecture comprises professional practice, investigation, and instruction where its products (knowledge, practical skills, and architectural artifacts) have remained the charge of field academicians, researchers, and

practitioners, jointly accountable to society and one another. (Piotrowski & Robinson, 2001, p. 62)

Architect education integrates technology (civil and mechanical engineering), history, and theory (art history, philosophy, design methods, and social science), communication (studio art and drawing, and computer-aided design), and urban design or planning. Thus, higher education divides instruction into design case studies and traditional lectures (Piotrowski & Robinson, 2001, p. 65) to generate new thought, data, or invention, ultimately adding to the knowledge base (Kahvecioğlu, 2007, p. 11). Implementing various teaching and learning strategies (Bradley, 2000; Brown & Yates, 2000; Schon, 1983; Webster, 2000), therefore, would foment learning architecture design skills and decision making (Ioan, 2001)

2.1. Design Studio's Unique Learning Environment

The architect learns to design in the design studio, the crucial action, providing an opportunity for architect students to develop into respectable designer (Corona-Martínez & Quantrill, 2003, p. 41). Principally design studio culture centers on the student, instructor, and the project, and one element cannot function independently because participants and projects in the studio intersect, permitting learners to interact with instructors and peers concerning the project (Lueth, 2008, p. 58; Stevens, 1998). Architecture engenders an academic field where cognitive curiosity, energy, and awareness feed architectural design and education (Kahvecioğlu, 2007, p. 11). Generally, the architectural curriculum deliberates content, rather than focusing on how

students learn, further representing student learning as self-taught, opposing traditional education concentrating on relaying the framework and tools within the program task (Iyer, 2018, p. 58). Various learning theories drive instruction, but architectural design coursework primarily resides on experience, building upon conventional approaches, learning-by-doing, promoting self-regulated learning. Students reflecting on prior experiences, reflection-in-action, using one or multiple techniques, profoundly developing into well-versed professionals (Iyer, 2018, p. 58).

Design studio as a learning environment encompasses five core tenets: psychological, pedagogical, technological, cultural, and pragmatic. Design studio, directly and indirectly, influence student learning, affecting student learning environments, engaging the student in material selection, motivating learning, and fomenting well-being, belonging, and personal safety (Partnership, 2019). Wilson (1996) added people employ available resources to make sense and construct meaning; thus, learning environment participants actively form knowledge, converging with constructivist theory where individuals actively contextualize reality (Lueth, 2008, p. 51). Design studio possesses a positive or negative emotional and social depth commonly expounding school or course social and emotional elements (Partnership, 2019) social learning settings share four commonalities (Hannafin, 1992; Lueth, 2008, p. 52):

- Scope: environment diversity in the pedagogical content and resource availability

- Content integration: knowledge integration diversity promoting several cognitive viewpoints
- User activity: user environments where students actively represent knowledge (generative) and are allowed students to learn (methanogenic)
- Educational activity: moving from goal-oriented to student-oriented learning.

Although the teacher disseminates rich academic and professional knowledge to the student, the instructor stifles learner creativity. While replicating professoriate ideas and values (Kahvecioğlu, 2007, p. 12), students cannot freely interpret tasks (Lueth, 2008, p. 53). Design studio must present a creative, spontaneous learning environment, permitting learning through examination (Hargrove, 2007, p. 1). Three postsecondary learning settings typify the design studio learning environment (Lueth, 2008, pp. 54-58): the constructivist learning environment (CLE), problem-based learning (PBL), and learner-centered learning (LCL).

(1) Constructivist Learning (CLE):

Constructivism focuses on a tailored learning environment (Jonassen, 1994), emphasizing distinct student ideas, styles, goals, and aptitudes (Reeves, 1992). CLE, according to Jonassen, Davidson, Collins, Campbell, and Haag (1995), aims to inspire the design process by constructing knowledge, offering meaningful, authentic learning applying the constructed knowledge, and providing peer and student-teacher collaboration where the professor presents facets in the design studio learning environment.

(2) Problem-Based Learning (PBL):

PBL implements case-studies in the classroom, especially in professional schools (law and medical). Although design studio may not mimic the PBL setting structural focus (Hannafin, 1992) leads the educator to create learning goals with specific assignments relating to it, discuss questions analyzing the problem (Kanuka & Anderson, 1999; Lacey & Merseth, 1993; Meirson, 1998); but, the design studio remains rooted in tradition of instructors imitating former instructors' teaching techniques (Anthony, 1991, Weatherhead, 1941), resulting in a reluctance to personalize and hone instruction. This embedded apprenticeship model and design studio collaboration have created traditionalism (Kostoff, 1977; Weatherhead, 1941). Design studio PBL fosters critical thinking, enhancing student participation, and problem-solving skills (Banerjee, 1994; Boud, 1985; Ostwald & Chen, 1994; Shannon & Brine, 1994). PBL considers previous student perceptions (Coles, 1990). Students recognize and determine the problem resolution, or the attempt (Margetson, 1994; Patel, Groen, & Norman, 1991; Shannon & Brine), emphasizing the design process. Students must defend their work through desk critiques (one-to-one with instructor) or reviews (assessor panel) (Anthony, 1991). About the architecture design studio, Schön (1984) observed the medical school rigor provided a prototype to which most professional schools aspire because of the problem-practice method used to prepare students for real life, or learning-by-doing (Schön, 1985) (Kahvecioğlu, 2007, p. 12).

(3) Learner-Centered Learning (LCL):

McCombs and Whisler (1998) defined LCL as identifying individual learner traits, like heritage, experiences, viewpoints, upbringings, aptitudes, passions, and desires, to develop a curriculum from existing learning methods. LCL tries to discover the most effective instructional design fomenting the highest motivation, learning, and performance for all learners focusing on how learning transpires. About the architectural design studio, design studios aspire to achieve these LCL innate traits: discovery, experiential, and active learning (Huba & Freed, 2000). LCL prioritizes student learning in an educational experience (Astin, 1993; Huba & Freed, 2000).

The Learner centeredness in the architectural design studio, therefore, depends on the academic, social, and physical environments, consistent with LCL categories (Alexander & Murphy, 1998) requiring a knowledge base, emphasis on individual differences and development, a strategic learning process, motivation and effect, and context situationality. LCL not only encompasses learning but also teaching that considers the culture in which the students are immersed (Ladson-Billings, 1995). The Constructivist (Bell, 1982), like Vygotsky, Piaget, and Dewey, shaped LCL (Grimmer & Mackinnon, 1992; Henson, 2003; McCombs, 1997; Reilly, 2000; Shulman, 1987). Connecting design studio learning with the previous higher education learning environments, design studio classes present a unique learning environment (Lueth, 2008, p. 58).

Weaver (1997) contended architect education aims to equip the to analyze conceptually gaining visionary, practical expertise to satisfy society's requirements and

objectives using space and form. Hence, the architectural student must successfully combine knowledge and application. (Saeid, 2001, p. 34). Architecture design studio pedagogy holistically tailors design coursework pedagogical hindering artistically and scientifically (Cowdroy, 2000, p. 25) the research backgrounds– academic, craft-based, technological, and sociological (Haider, 1986; Salama, 1995; Salama & Wilkinson, 2007). Dutton (1984) asserted design studio training actively engages students intellectually and socially, presenting various tasks oscillating between analytic, synthetic, and evaluative rational (sketching, articulating, model construction) (Lueth, 2008, p. 59). Salama (2005, 1998) cited PBL and constructivism when he pointed out design studio instructors pay attention to project-based schooling, restricting teacher instructional design (Lueth, 2008, p. 59). Agryis, 1981; Anthony, 1991; Austerlitz, Aravot & Ben-Ze'ev, 2002; Schön, 1985) revealed the design studio's reflexive learning made postsecondary professors adopt the design studio educational environment (Schön, 1985) to the point architectural programs have embraced Kolb's (1984) learning style inventory. Academics most commonly employ experiential learning to explore architectural design studio education. Additionally, Messick described (1984) design education as cognitively promoting self-regulated, personalized learning, fomenting architecture student persistence (Roberts, 2006, 2007), architectural concepts comprehension (Saalman, 1990), architecture artifact production, planning, and engineering (Akin & Akin, 1996; Purcell & Gero, 1998), and design process and cognition (Chan, 1995; Lui, 1996) (Lueth, 2008, p. 60).

2.2. Learning Architecture Design Skills and Decision Making

Learning architectural design constitutes artfully solving a functionally defined problem employing prevailing design techniques. The design process requires the time, fortitude, knowledge, and skill to bring a vision to fruition (Box, 2007, p. 82). Incessantly constructing a dream using skills and knowledge (Box, 2007, p. 12) entrenched in a multidimensional process (Martinez & Quantrill, 2003, p. 7), mandates design excellence talents. Designers want to apply their work generally, characteristically exploring a subject by immersing themselves in it and subsequently reaching an abrupt, instinctive design epiphany (concept) (Cowdroy, 2000, p. 25).

Achieving design excellence remains vital in design learning. The top US architecture schools asserted new graduate's priorities amongst firms have remained paramount for design skills (48.5%). While knowledge in other disciplines, like sustainability and climate change (45.8%), interdisciplinary design (47.2%), and technology changes (45.8%), ranked highly, positive attitude and personality (70.1%) added new hire value (Rosenfield, 2013; Watkins, 2014). Since 53% of the respondent schools wanted office-ready architectural graduates (Cleempoel, 2003), they revealed they desired digital drafting and 3D modeling proficiency (S.Willey, 2005, p. 200) and design excellence skills (Incedayi, 2005, p. 117; Sornig, 2005, p. 106). Architectural thinking remains more challenging than other careers, for the architect must produce a functional art form to satisfy user's needs, requiring a broad skillset (Box, 2007, p. 81). Architect learners must achieve design excellence to think like an architect mastering design or designer culture and the design process (Cowdroy, 2000). Designers combine

the variables to reach decisions others will judge (Box, 2007, p. 83). Society requires architects to keep abreast of the dynamic theoretical and practical knowledge; thus, they have to sharpen their architectural planning and design skills persistently (Wasserman, Sullivan, & Palermo, 2000, p. 7)

For this research, the combination of personal skills and knowledge related to architecture design learning in school depicts the architect student design culture. The ingenuity and talent associated with an architect (Fisher, 2000, p. 67) illustrate design culture. On the other hand, primary architecture norms, directing architecture and related procedures, including instruction and research, construction and design, and public participation (design process) (Wasserman, Sullivan, & Palermo, 2000, p. 16).

2.2.1. Architecture Design Skills - Design Culture

A class reviewing architectural history does not teach architectural culture. Architecture curriculum must embrace the architectural culture when teaching a student to design inviting the learner into the culture. Additionally, the student must master current practice, as well as new techniques (Corona-Martínez & Quantrill, 2003, p. 164). The significantly individual design culture can affect the architect's behavior, worldview, and choices, and preferences (Fisher, 2000, p. 67), creating a personal and social self-identity (Fisher, 2000, p. 69).

Design schools foster a design culture cultivated from history, environmental interaction, communicating with peers, and learning from instructor worldly experiences. Hence, the university culture constructs standards the student might use as

a designer to judge self or fellow designers (Wasserman, Sullivan, & Palermo, 2000, p. 4). Keeping in mind building purpose, client hopes, intentions, and motives, designers envision a precise plan to accommodate parameters beautifully, so people use norms to judge the creation: history, interactive experience, professional knowledge, and communication.

2.2.2. Architecture Design Skills - Design Process

Students should know architectural design is divided into many phases, facilitating visions transforming into reality. Design process engenders operations, generating a copiable prototype, despite the fact design uniquely advances (Corona-Martínez & Quantrill, 2003, p. 7). Evidence and passions connect project research, conceptual design, alternatives, evaluation, and aspirations while, also, constraining client-consultant collaboration reconciled in a final report (Corona-Martínez & Quantrill, 2003, p. 181), citing building function, contents, clientele, community role, and urban footprint within the proposed budget (Box, 2007, p. 82). Design develops a new structure using another object where a designer confidently and satisfactorily alters the object (Corona-Martínez & Quantrill, 2003, p. 3).

The design process reflects the design culture, vital to the architect's work, unmasking a forthright logical quest, motivation, artful resolution, and expression—creatively solving problems via art (Box, 2007, p. 82) and reflecting the architect's cultural manifestation (Wasserman, Sullivan, & Palermo, 2000, p. 15). Architecture uses theoretical studies to direct design and decision procedures to educate and

construct works embracing intrinsically ethical practices directed to improve the world (Wasserman, Sullivan, & Palermo, 2000, p. 8). Finally, the process results in the product, building, problem solution, and architect design creating an object or its analogical description, comprising drawings, models, and material specifications of the proposed building (Corona-Martínez & Quantrill, 2003, p. 25). Students must learn to use the design process to deal with and use different project factors to uncover new components and priorities, progressing and refining the project (Box, 2007, p. 83). Zoning ordinances, building and fire codes, environmental guidelines, insurance mandates, outline the minimum building requirements (Box, 2007, p. 86). The architect realizes these parameters, examining three worlds: site (community or landscape location), program (owner needs and desires), and budget (Box, 2007, p. 82).

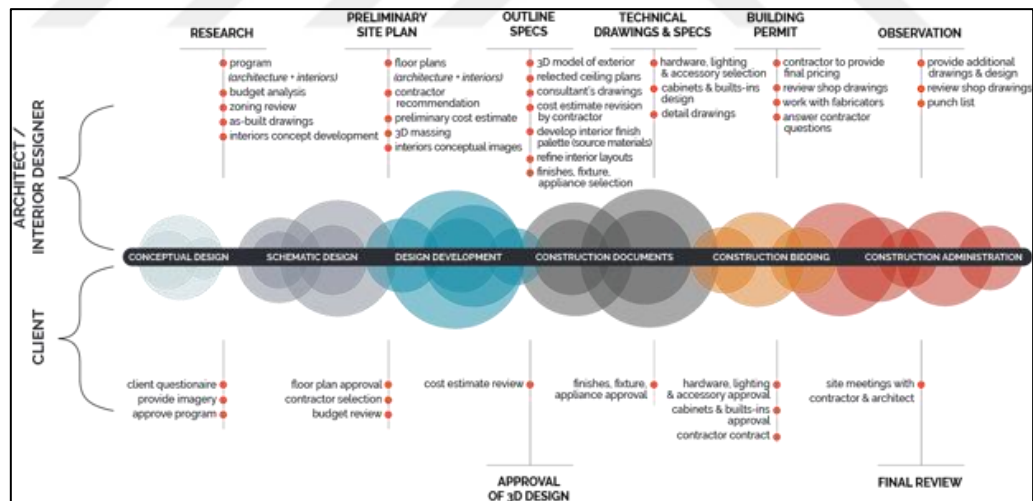


Figure II.1. Design Process Phases in Architecture and Interior Design

Since the design process practically aims to describe a concept to clients constructing a building (Corona-Martínez & Quantrill, 2003, p. 30). An architect solves intricate issues illuminating a concept (Box, 2007, pp. 69-70), fomenting a healthy relationship between design culture and process for architecture students enhances their design skills and design decision making.

On the one hand, design culture for architect students demonstrates how they address the design question using contextual and practical technological knowledge, history, theory, cultural, and future vision (Wasserman, Sullivan, & Palermo, 2000, p. 15). They use the skills and background amassed during academic preparation at architectural universities or work experience as a professional architect (Fisher, 2000, p. 72). On the other hand, the design process building on the previous step relates the parts to the whole, defining relationships, establishing future building structures (Martinez & Quantrill, 2003, p. 10).

Decision making remains essential for the student to learn design problem-solving skills. Students, as designers, initiate and solve issues, isolating the problem to identify the crux of the matter to resolve it efficiently (Adams, 1986, p. 23). Architectural drawings bring a vision into existence, for representation brings form to a concept (Piotrowski & Robinson, 2001, p. 91). These drawings are the result presenting list of project brief is to an architect, The architect will introduce order into the brief until the brief has the same order as the design in the making, the architect first will be solving the building problem bit by bit, dividing the pieces and attempting to unify them. Finally, a general idea forms, an order described as simplifying complexity (Corona-

Martínez & Quantrill, 2003, pp. 8-9) Design learning entails experientially enlighten decision making, converting knowledge into experience represents embodiment (Piotrowski & Robinson, 2001, p. 72). Architecture continually makes decisions, directing toward the optimal solution to value-driven and noble pursuits. Architect students encounter tasks requiring judgment, respect, and trust (Wasserman, Sullivan, & Palermo, 2000, p. 5), honing their decision-making aptitude. An architect uses judgment skills, fostering quality judgments (Wasserman, Sullivan, & Palermo, 2000, p. 4). Architecture education equips students with design excellence, teaching them to design (Box, 2007, p. 81), focusing on acculturation and postulating the way the information society quest for innovative knowledge impacts the demand for architectural education (Harder, 2005, p. 11).

These design factors influence the design skills occurring in one unique environment, the design studio, where well-documented learning pedagogically focuses on hands-on learning (Ghaziani, Montazami, & Bufton, 2013)—drawing, building models, and learning from peers while fostering relationships (Box, 2007, p. 71).

2.3. Learning Design Skills in Design Studio Shortcomings

The still used Ecole des Beaux-Arts underlies design studio education. The studio represents a locality, as well as pedagogy,-epitomizes architectural education Hence, may instructors do not challenge prevailing concepts (Salama & Wilkinson, 2007, p. 106) Even though the design studio remains distinct, enigmatically design studios education displays independence through its guidelines, customs, and disclosures,

architects emerge from architectural academia (Salama & Wilkinson, 2007). Numerous specialists have asserted universities have fundamentally failed to prepare learners to function in the real architectural arena (Fisher, 1989; Forbes, 1985; Smith, 1984). Scholars have professed studio education engenders an unrealistic microcosm (Fowler, 1985; Fox, 1984; Gutman, 1987; Pawley, 1983; Stubbs, 1987; Wines, 1984), unclearly revealing the design studio objective (Ledewitz, 1985, p. 2). Indeed, Anthony (1991), Cuff (1991), Koch, Schwensen, Dutton, and Smith (2002), Salama (1995, 1998, 2002), Sanoff (2003), Schön (1981, 1983, 1985, 1988), Seidel (1994), and Stamp (1994) have corroborated Ledewitz's (1985) critique.

Trivial cliques have driven faculty (Rapoport, 1982) to impose impractical student guidelines (Carolin, 1992) devoid of practical reality (Heinlein, 1981). The curriculum abandons the design process goal to promote intuition, critical, and rigorous (Lueth, 2008, p. 59; Salama, 2005), plus practical industry thinking (Carolin, 1992; Fowler, 1985; Gutman, 1987; Muir, 1991). Mavens have not only recommended integrating practical courses (management and technical) but also limitedly bringing back apprenticeships (Cobb, 1985; Filson, 1985; Mitchell, 1984).

Table II.1. Practice and design studio architecture design process differences

| IN THE DESIGN STUDIO | PRACTICE |
|---------------------------------------|---|
| Creation starts from elements | Adaptation from existing types |
| Use of avant-garde models | Use of socialized models, or from the office experience |
| Universe of the Project | Universe of the Program |
| Another architect as client | A client who does not “understand” |
| Without any budget | Definite budget, financial problems |
| Low material definition | Detailed material definition |
| Atypical structures | Typical structures |
| Long time allowed defining a problem | Long time devoted to development |
| Function described as sizes | Function described in other contexts and circulation patterns |
| Time for delivery of project | Time factor linked to monetary value |
| Completing the design on time | Getting a commission |
| Undertaking only one design at a time | Preparing several designs at the sometime |

Source: (Corona-Martínez & Quantrill, 2003, p. 170)

In the following lines, the researches mention a few of the shortcomings that she believes will help establish a problematic question in this thesis and that design studio encounter:

2.3.1. Academia and Practice Design Process Disconnect and Confusion

Initially, design studio students must decide a design approach to espouse, artistic, or functional. The problem remains, the learner begins with artistically will render the item one perceives it, shortchanging the product and the process. Even when the novice plans on a single projection, the learner develops the entire strategy before exploring the other solutions (Corona-Martínez & Quantrill, 2003, p. 26). Preferably, the object-

design solution should advance the design process project definition, refining graphics, and minimizing alternatives to arrive at one design. Moreover, As drawings are added to the evolving project, the designer encounter s many development choices before deciding on the final piece (Corona-Martínez & Quantrill, 2003, p. 26). Since no correct design architecture exists, architects are said to practice (Box, 2007, p. 109), but in architecture schools and particularly in design studios, teaching students design process, have given an academic direction lacking creativity, or practice).

The design process has diverged from academia, creating an item beyond the problem-solving and decision making, but in practice producing more than an object. In the past 15 years, architecture professors have deviated from practical discourses where theory has emerged as an unconnected initiative, independent of practice, and theorists have worked diligently to distinguish academic scholars. The increasing emphasis on generating academic experts, instead of producing practical professionals, has separated how architects and architecture operate beyond the university, and students suffer from this disconnection (Piotrowski & Robinson, 2001, p. 266).

2.3.2. Lack of Project Brief Understanding Creates Premature Solutions

Another decision the student might face is “what info/data/factors from the project brief to address or ignore. If the student tries to act like a professional problem-solver, the learner must remain alert to perceive the problem correctly. They may not always see the problem clearly and be able to score heavily by curing the difficulties of the project more directly through a clearer perception of what the problem is. (Adams,

1986, p. 23), as achieving “control over all three dimensions is quite tricky for a student, and the plan is misleading. Inexperienced design trainees precisely draw impulsively. Since the designer only considers certain elements when deriving the first schema, defining the object or plan separately, concretely forms the product negating some brief features. This omission occurs when either the designer infers superficial essence, responding to parameters or only observing the obvious (Corona-Martínez & Quantrill, 2003, pp. 26-27).

2.3.3. Representations Difficulty: Student Architecture Language Blocks

Development

Pundits direct learners through progressive design procedures during their architect education. Hence, students create designs for fictitious buildings, not knowing truly if the rendition transcends from theory to practice successfully. Notably, what works on paper may not transfer to reality (Corona-Martínez & Quantrill, 2003, p. 33), confusing rookie architects face confusion (Box, 2007).

Inherent in design skills learning, the student needs to decipher how to present their design to others. Design and construction diverge in architecture teaching, affecting representation over design more profoundly. Even when using previous case studies, these renditions more often engender drawings or photographs than actual buildings. Mastering the language or graphic convention mandates describing a three-dimensional object on a two-dimensional surface. Essentially transforming an imaginary item using words and sentences, hypothesis, drawings, images, and models

where a professor judges it as if it were a real object (Corona-Martínez & Quantrill, 2003, pp. 28-30). Language for design studio students significantly epitomizes the conventions and codes colleagues understand. However, sometimes, design studio students face challenges correctly expressing themselves when building. Some students reuse the same verbiage, encasing them in a rigid dialect, and closing themselves off from new influences. Hence, when they dialog about their inanimate creation, they render their drawings impossible for third-party to interpret (Corona-Martínez & Quantrill, 2003, p. 31).

On the other hand, other students have the opposite problem. When they fail to master proper design studio semantics, the students generate new images and diagrams and get entangled in a mental image-idea loop and, not knowing how to words or graphics to explain their projects. Markedly, the design process develops over a long period, and the drawing encompasses the syntactical code. Drawing continuity representing industry socialized verbiage will more effectively relay an object than the ephemeral mental descriptions (Corona-Martínez & Quantrill, 2003, p. 32).

The last problem student might confront in design classes is how to control the language changes throughout the process. As they alter items, objects continue to evolve; thus, maintaining coherence when adding new elements subtracting others remains paramount. After modification, the design must review the results to determine the change impact, for alterations can progress or regress a project. Notably, since visual computing has facilitated modifications, designers tend to tweak their articles more readily (Corona-Martínez & Quantrill, 2003, pp. 32-33).

2.3.4. Student Design Culture Challenging Design Process

Meeting precise guidelines, the most significant act in the predesign phase (Box, 2007, p. 59), sets the basis for future designer-reliant assumptions maintained throughout the design process even as the item evolves. Notably, the student project information perspective persistently alters during the design procedure (Corona-Martínez & Quantrill, 2003, p. 26).

However, sometimes, design culture can obstruct project progression (Fisher, 2000, p. 68). When a learner demonstrates innovative creativity, the person's individuality promotes artistic self-actualization inherent in architecture (Corona-Martínez & Quantrill, 2003, p. 43). However, creative people hold back from responding to rapidly changing market conditions; for taking pride in their perilous financial state and increasingly marginal role in the design and construction process." "resisting certain kinds of change." (Fisher, 2000, p. 69) "such an obstacle has to do simply with the different assumptions we make based upon our different intellectual traditions. Rationalism, idealism, empiricism, and romanticism are commonly thought to be incompatible positions, and they do sometimes get in the way when designers try to do interdisciplinary work." (Fisher, 2000, p. 73)

2.3.5. Teacher Design Cultures Challenging Student Creativity

Teachers replicate what they learned from their professors (Salama, 2005). (Lueth, 2008, p. 59), who disseminated their wisdom and professional guidance to the pupil. While valuable, students, thus, reflectively repeating the sage dissuades creativity

(Kahvecioğlu, 2007, p. 12). Design studio “must encourage ingenuity to navigate the novice to delve into spontaneously unfathomed avenues (Hargrove, 2007, p. 1).

2.3.6. Design Studio thrives Fashion and Individualism

After earning a degree, architectural graduates enter the professional realm they have only known theoretically. Hence, the rookie architect tends to cling to the known world. Hence, novice projects often fail to connect with the environment producing traditional, educationally reinforced items. Academia informally neglects the way an architect employs visionary design transcending the architectural norms academia sets (Corona-Martínez & Quantrill, 2003, pp. 42-43).

2.3.7. Brief Teaching-Learning Time in Design Studio

Even though studio lack emphasis in architecture curriculum, studio, vital to architect training, constitutes a primary architect responsibility when designing buildings. Hands-on learning encompasses learning to design items by designing them, transferring the theoretical (implicit) to the applied (explicit). Design knowledge judged through practice bring reality to education (Corona-Martínez & Quantrill, 2003, p. 42).

According to (Schön, 1985), Studio design education does not emphasize a singularly dimensioned framework, yet it transcends uniform instruction, guiding design students to think multi-dimensionally and dynamically (Kahvecioğlu, 2007, p. 13). However, design studio instruction remains brief, failing to convey the design process to students (Hargrove, 2007).

2.3.8. Traditional Teaching in Design Studio Produces Dependent Students

The PBL tradition engenders learning-by-doing (Kahvecioğlu, 2007, p. 12; Schön D. A., 1983); and this preparation remains imperative to future professional success (Hargrove, 2007). Since design studio tasks simulate real demand, they do not merely illustrate buildings drawn conventional specifications (Corona-Martínez & Quantrill, 2003, p. 42). The aspiring designer faces a tangible design problem and undertakes the design process to create a building portrayal to solve the problem. The mentor, acting as the client, counsels the student in dealing with prospective clients. In fact, the actual client seldom materializes, and if the clients do appear, they encounter representations far from what they envisioned because the student-maintained architecture standards, not heeding to client personal wants. (Corona-Martínez & Quantrill, 2003, p. 42). The design dialog occurs between the learning architecture and the expert instructor. This discussion commonly overlooks the rigid brief guidelines not incorporated in the pretext (Corona-Martínez & Quantrill, 2003, p. 43).

2.4. Challenges of Learning Design Skills in Design Studio

In the previous section, the researcher has illuminated the primary design studio shortcomings which are:(1)Academia and Practice Design Process Disconnect and Confusion,(2)Lack of Project Brief Understanding Creates Premature Problem Solving,(3)Project Representations Difficulty: Student Architectural Language Blocks Development,(4)Student Design Culture Challenging Design Process, (5)Teacher Design Cultures Challenging Student Creativity,(6) Design Studio thrives Fashion and

Individualism,(7)Brief Teaching-learning Time in Design Studio,(8)Traditional Teaching in Design Studio Produces Dependent Students. These shortcomings will eventually create challenges in design studio learning. The challenges can be summarized in three points as below:

2.4.1. Architectural Design Studio Education and Practice Isolation

The architectural education-practice gap has caused many novice architects anxiety, sparking schools, professional organizations, and publications to scrutinize the divide between schooling and practice (Piotrowski & Robinson, 2001, p. 260). Academia has maintained academic freedom to disseminate knowledge to students who prepare for professions; however, the lack of preparedness for the architectural career has caused actors to question various aspects, including the architectural education coursework, exchange, and collaboration between schools, education-professional context, and quality assurance and academic assessment to trace how knowledge flows from colleges into business and society (Cleempoel, 2003, pp. 13-23). However, architecture education needs to restructure to satisfy practical needs. While operating in an unregulated global economy, architectural academics must confront severe obstacles without public or private assistance (Piotrowski & Robinson, 2001, p. 7). Critics have asserted the isolated design studio overstresses the individual, inadequately equips students with expertise to transcend from education to practice (Centra, 2000). While creative potential as broad as possible, design schools must reengineer to teach prospective designers' learners to think critically (Fisher, 2000, p. 5).

- Solution: The goal is to break these siloed realms distinguishing theory from practice, challenging the traditional approach. Researchers have elucidated context impacts theory, and learning is profoundly associated with practical evolution occurring in context (McDrury & Alterio, 2003, p. 20). This realization drove architectural design education to move beyond monumental religious buildings to embrace secular life (Habraken, 2003).

2.4.2. Design Process Limited Understanding as a Functional Need

Architects must question seriously, looking to resources (drawing boards, computers, publications, seminars, and public forums) to transform the functionally physical structure into architectural representation successfully (Box, 2007, pp. 49-50). Design studio education includes “teaching styles, pedagogy, student learning, the project, learning experiences in the design studio” (Lueth, 2008, p. 98). However, critically design studio education in architecture must teach design as a creative process (Hargrove, 2007, p. 1); and foment innovative ingenuity, constructing and promoting a cognitively accepting procedural awareness fostering creativity (Hargrove, 2007, p. 1).

- Solution: When uniting creativity and problem solving, as in the case of native intelligence, the person presumably gains the capability to reply innovatively, while innately displays usefulness. However, present researcher refutes this view, for creativity as a self-regulatory, metacognitive process (Hargrove, 2007) requires a problem solving professional employing artistry (Box, 2007, p. 82; Habraken, 2003); and this skill can be taught (Hargrove, 2007, p. 2).

2.4.3. The Lack of Design Decision Skills Independence in Design Studios

Design excellence requires the designer to generalize their design. After designers discover the overall subject, they subsequently engross themselves obsessively in it to spark an abrupt, instinctive design decision, equivalent to fundamental research (Cowdroy, 2000, p. 25). Scholars have voiced reservations about the student-teacher interaction embraced in studio pedagogy. Argyris (1981), historically linked the studio model to the master-apprentice methods, dubbing this educational format the mystery-mastery approach, for, despite the fact the instructor has mastered architecture, the mystery resides in the process the instructor navigates to achieve mastery (Saeid, 2001, p. 37).

- Solution: Building student design decision excellence skill independence has remained a challenge. The researcher asserts an obstacle to improving student design skills resides in learner dependence and the quest for instructor approval. Seeking help throughout the design process prevents students from unveiling new concepts to fix problems students have created in design solutions. After redefining tutorial design process involvement, students must attack design matters themselves (unaffected by professor design preferences), keeping a personal design culture. Improving student design excellence skills, the researcher has cross-referenced alternative learning theory combining the three concepts (PBL, LCL, ADD the third) into a single technique focusing directly on the design studio.

III. SOLUTION APPROACH

Over the years instruction has evolved immensely not only transferring from disseminating knowledge (Ory, 2000, p. 13) but also fostering relationships to transform the learner socially, as well as cognitively the stress is on improving teaching. Hence, while taking heed to cost, availability, and quality, instructional designers have developed methods to foment more learning (Braskamp, 2000, p. 23). Similarly, Learning encompasses many facets: acquiring abstract principles, comprehending theorems, recalling factual data, mastering methods, recognition, reasoning, debating ideas, or developing behavior appropriate to specific situations” (Fry, Ketteridge, & Marshall, 2003, p. 9). Basically, learning engenders how people decipher reality, decoding the world to create meaning. Therefore, when instruction comprehensively delves into a topic, it transcends the superficiality traditional rote learning embraces. Design skill mentors should incorporate this in-depth learning in design studios where professors fashion curriculum and instruction to satisfy definite objectives, promoting active learning (Wiggins & McTighe, 2005, p. 13). Education must equip students to take their learning and use it to apply, generalize, judge, synthesize, and create innovatively (Fry, Ketteridge, & Marshall, 2003, p. 22).

Architecture curriculum offers hands-on, self-regulated learning, encouraging the student to reflect on experiences developing a well-versed professional (Iyer, 2018, p. 58). However, the learners must not lose focus and examine more closely what they are performing, not the professor, for comprehending their actions remains paramount

(Biggs, 1993). Even though postsecondary learners navigate and engage in learning, instructors must create educational experiences to promote this constructivist paradigm. Hence, teachers must examine the learning as transcending the rote learning innovatively designing coursework fomenting critical cognition (Fry, Ketteridge, & Marshall, 2003, p. 22). As designers begin to master these skills, they employ the critical learned skills to tackle issues, not backing down, exceeding mediocrity, and employing unconventional strategies (Wiggins & McTighe, 2005, pp. 6-7). Academics must instruct and evaluate according to learning paradigms (Fry, Ketteridge, & Marshall, 2003, pp. 22-23): constructivism, rationalism (or idealism), adult learning theory, experiential learning, and reflective learning. (Fry, Ketteridge, & Marshall, 2003, pp. 11-17). Following is a brief description of each of the theories:

- **Constructivism Learning:** Constructivism purports people make meaning from social experiences and context (Kanzian, Kletzl, Mitterer, & Neges, 2017); hence, it comprises a continual experience occurring everywhere (Vygotskiĭ, Luriĭa, Golod, & Knox, 1993). People amend the previous schema with each new experience, integrating actions and ideas; thus; learning personally transforms an individual (Fry, Ketteridge, & Marshall, 2003, pp. 10-11).
- **Experiential Learning:** Experiential learning epitomizes learning through experience requiring reflecting on the action, setting it apart from hands-on learning, where learner reflection is not essential. Although experiential learning bears many similarities to active learning, such as action learning, adventure learning, free-choice learning, cooperative learning, and service-

learning.” (Itin, 1999) Kolb (1984) pioneered experiential learning, laying the groundwork for teaching models, like work-based, placement, and action learning, teaching laboratory and practical work, role play, and small group teaching. (Fry, Ketteridge, & Marshall, 2003, p. 14).

- **Reflective Learning:** Reflective learning encourages learners to detach objectively from their educational experience to examine their experience critically to enhance performance. Basically, it engenders learning by thinking. Dewey (1933) seminally proposed continuously reexamining knowledge premises actively questioning its validity and direct action (p. 9). Dewey (1933) asserted experience cannot solely induce learning, for the individual must maintain mindful cognizance for learning to transpire. Reflection, fundamentally intersecting with metacognition and self-regulation (Chen, Chavez, Ong, & Gunderson, 2017; Lang, 2012; Walker, Sharma, & Smith, 2016), advances learner insights gleaned from life experience. This contemplation equips people to improve conclusions and learning (Rogers, 2001), creating a self-regulated learner. Self-direction, as defined by Hadwin (2008), constitutes behaviorally and affectively accomplishing an objective employing thoughtful, cognitive preparation, observation (Huang, 2017, p. 179).

3.1. Reflection and Experience as Learning Theories

Prevailing student learning theories in higher education, especially in medical and law schools, focus on experiential and reflective learning theories based on constructivism (Fry, Ketteridge, & Marshall, 2003, pp. 10-11; McDrury & Alterio, 2003, p. 11). This researcher used reflective and experiential learning theories within the design studio learning environment and as a design tool to improve student design skills.

3.1.1. Reflection and Learning

Leaners do not passively receive information from professors (Braskamp, 2000, p. 23), yet education incorporates diverse student cultures and goals into learning, for people to learn differently. Therefore, educational research cannot proffer the ultimate instructional for all actors (Fry, Ketteridge, & Marshall, 2003, p. 9).

Reflection in education has sparked expert debate. Reflection navigates students to learn to discover themselves and their studies. Since the educational drives learning, the university setting affects learning (McDrury & Alterio, 2003, pp. 19-20).

Polanyi (1967), strove to minimize the gap between dominant and practical theories, supporting reflection. Specifically, personalized application reflection unmask practitioner realities, not integrated into espoused paradigms, instigating new philosophies (McDrury & Alterio, 2003, p. 20). Reflection heightened tacit knowledge awareness, transforming “knowing-in-action to knowledge-in-action” (Schön, 1983).

Although they advocated reflection as a learning tool and have analyzed the processes of reflection, theorists and practitioners do not concur on a single reflective learning definition:

- Reflection involves taking intricate, amorphous thoughts with no evident answer and cognitively and purposefully processing projected results (Moon, 1999, p. 98).
- Reflective learning encompasses an experientially activated progression internally scrutinizing a matter to elucidate self-implication altering an individual's outlook (Boyd & Fales, 1983, p. 99)
- Reflection communally assists human interests while it politically communicates decision-making and social action reconstructing society (Kemmis , 1985, p. 140).
- Reflective learning generically depicts logic and emotion engagement investigating personal experiences generating novel viewpoints (Boud, Keogh, & Walker, 1985, p. 19).

These concepts converge where reflection comprises the self, and reflection consequences transform one's perspective conceptually. Academically defining reflection has proven elusive (McDrury & Alterio, 2003, p. 21) due to its arbitrary thought propagation intermixing information and conjecture. Markedly, for those who want to investigate a concept, theoretical reflection seems more natural to outline (Moon, 1999).

The reflective process constitutes various features:

- Reflection comprises metathinking where people thinking about thinking, prospectively instigating deeper contemplation and enacting change (Kemmis , 1985)
- Life reflection represents persistent autobiography navigating activities and choices, directing individual meaning depending on personal and social situationality (Dilthey, 1977).
- A person can reflect on and process experience using explanation and expression. Explanation categorizes, conceptualizes, and constructs standpoints using experience. Observed or derived concepts actively engage students to learn and develop self-regulation, theoretically attributing meaning to experience (Reason & Hawkins, 1988).

Mezirow's (1981) seven reflection levels and the three levels of Schön (1991) purported conscious reflection, criticism, and action. However, Hatton and Smith's (1995) five-level approach proposed methodical, expressive, discursive, and critical reflection, plus reflection-in-action, occurring in the professional environment during the incident. (McDrury & Alterio, 2003, pp. 22-23). However, most authors agree reflection epitomizes three stages, as Atkins and Murphy (1993) summarized. The first stage depicts internal uneasiness, the second stage entails the surprise, and the last stage transforms one's worldview, where a new perspective emerges. These integrated three stages demonstrate reflection epitomizes learning as a socially reflective process.

Notably, when processes incorporate others, they increase in productivity; thus, questioning remains imperative to fruitful reflection (McDrury & Alterio, 2003, p. 23).

Reflection intersects with three thinking elements: technical, practical, and critical (Kemmis , 1985). While technical cognition applies expertise in a constant setting, practical thinking holistically, and critical approaches reasoning. Critical analysis, the most complex, dialectically examines social and historical event experiences. As people moving change thinking modes, their perspectives and ideas reflectively transform from one stage to another (McDrury & Alterio, 2003, p. 22).

3.1.2. Experience and learning

Kolb's (1984) four-phased experiential learning cycle included four adaptive learning components: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Learning communities have employed Kolb's (1984) model extensively, noting experience does not assure learning. A student must experientially reflect, (extrapolating understanding to additional circumstances, translating knowledge into action, and assessing the action results) for meaningful learning to transpire. Although student performance at cycle points vary, these differences reveal personal learning styles. Students must complete each stage, and reflection quality profoundly influences student learning achievement. Primarily, reflective observation proves the most perplexing due to students, instruction, environmental, and reflection factors (McDrury & Alterio, 2003, p. 25).

The five schemes involved in experience relation to learning entail:

1. Experience founds and stimulates learning;
2. Learners actively formulate experience;
3. Learning portrays a holistic process;
4. Social and cultural factors generate learning;
5. Socio-emotional context impacts learning (Boud, Cohen, & Walker, 1993, pp. 8-14)

The architectural curriculum embraces learning by doing (experiential learning) (McDrury & Alterio, 2003, p. 14). Pundits have proposed models classifying student learning inclinations. Although no starting point is specified, the learning process represents a four-dimensional cycle; a person must experience to learn. Two of the four phases designate the way learners comprehend— concrete experience and abstract conceptualization (Kolb, 1984). Active experimentation and reflective observation, the other two, demonstrate how learners convert experience into learning (Lueth, 2008, p. 35). Since this philosophy embraces experiential learning, mavens have explored design studio architecture curriculum using Kolb's (1984) approach (Lueth, 2008, p. 36).

3.2. Reflection and Experience Learning Theories in Design Studio

Six features related to reflection and experience learning theories include emotional experience learning, meaningful learning, deep understanding, collaborative learning, isolation breaking, and using new learning tools.

3.2.1. Emotional Experience Learning

Reflective practitioners seek to connect thoughts and feelings, and experience offers the socio-emotional aspects needed in higher education, where teaching and learning strategies promote intellectual and practical pursuits. In other words, emotional experience, such as collaborative journaling, looking for patterns, examining cautiously, spontaneous drawing (McDrury & Alterio, 2003, p. 26), significantly enhances learning (Boud, Keogh, & Walker, 1985, p. 15).

3.2.2. Meaningful Learning

The unknown elicits reflection, prompting deep contemplation. Reflective practice stresses experience, minimizing theory (Schön D. A., 1983). Knowing and doing work synonymously, as practicing professionals confront multifaceted conditions; therefore, rational learning proves inadequate (McDrury & Alterio, 2003, p. 24). Reflecting on experience causes meaningful learning, making student, apply the experience to additional circumstances, interpreting learning into action, and appraising the action consequences (McDrury & Alterio, 2003, p. 25).

3.2.3. Deep Understanding

When reflective and experience theories unite, it relevantly links the learning process, transforming learning into a five-stage map: noticing, making sense, making meaning, working with meaning, and transformative meaning (Moon, 1999, p. 136). In-depth learning mandates the superior intellect to reason conceptually, linking the situation to previous knowledge, uncovering patterns and fundamental principles,

verifying evidence concerning assumptions, probing logic and argument vigilantly and critically, and actively maintaining interested in the course material (Entwistle, 1996). Students, thus, independently select measures needed to boost their subject mastery, creating an autonomy.

3.2.4. Collaborative Learning

Reflection, as an interactive, social process, cannot exist without action or context, especially involving others to question individual assumptions (McDrury & Alterio, 2003, pp. 23-24). Vygotsky's sociocultural theory situates context as vital to learning. Context setting allows students to uncover socially-derived meaning through interaction, empowering students to familiarize themselves with the circumstances and seek support with issues exceeding their capability (McDrury & Alterio, 2003, p. 28) (Lueth, 2008, p. 41). Hence, the zone of proximal development (ZPD) defined by Vygotsky (1987) the gap separating the independent problem solving (actual development) and problem-solving under adult guidance or in collaboration with more capable peers (potential development).

3.2.5. Breaking the Isolation

Reflective learning does not occur in isolation, yet it benefits from student background and culture. Learner perceptions drive learning; therefore, learning strategies unveil beliefs celebrating the cultures of all students to embrace diversity. Learning processes need to integrate, not assimilate (McDrury & Alterio, 2003, p. 27).

3.2.6. Using Innovative Learning Tools

Vygotsky's (1987) social thinking (1987) asserted situationality, the circumstances in which people interact pointedly influence learning potential. Individuals evolve (human development) when culturally inculcated (sociocultural theory) to learn to advance oneself and humankind (educational theory). Hence, educators must recognize how instructional design propels thinking, driving innovative learning paradigms (McDrury & Alterio, 2003, pp. 27-28). Vygotsky (1987) contended learning represents dynamic communal conceptions, advanced through social interaction, and underdeveloped when isolated. Social and cultural resources, like spoken and written language, demonstrate locale shapes people (McDrury & Alterio, 2003, p. 28). Scholars have principally focused on the language portion of his research, but recent experts have explored the social learning setting in instructional design, creating cooperative learning and PBL environments (Lueth, 2008, p. 41).

Finally, 15 reflection activities (aggregated to five categories) help students examine learning (Heick, 2018):

- Verbal Reflection: (feelings, expertise, or cognition) entails students articulating their knowledge, emotions, anxieties, and obstacles with the entire class or a few peers. Students intellectually connect education with experience, creating an objective, reflective, interpretive, and decisional experimental cycle: (Kolb, 1984).

- Journals: Journals (personal, highlighted, critical incident, and dialogue) enable learners to decipher issues and emotions critically, usually following a mentor-outlined format (Hatcher, 2019).
- Reflective Essays: Formalized journaling exemplifies reflective essays, promoting individual development, linking classwork to academics, or future goals (Hatcher, 2019).
- Directed Writings: When students deliberate an experience concerning course content, they engage in directed writing. The professor poses a question from the course material and asks learners to ponder their experience regarding the situation (Hatcher, 2019).
- Experiential Research Paper: A formal assignment, an experiential research paper, reveals and examines an experience or situation within the broader course context recommending change. Subsequently, the student explains the underlying discipline-specific problem, reading relevant empirical literature to investigate the social issue. Then, they compile the issue and research to suggest future actions. This reflection activity has proven appropriate for interdisciplinary topics and expertise regarding service site problems. Students, finally, present their experiential research findings (Hatcher, 2019).

3.3. Alternative Learning Tool in Design Studio: Storytelling

Learning through reflection and experience improves student design skills in design studio classes because it addresses the three points on how to enhance student

design excellence unifying design studio and practice, teaching students to be creative problem-solvers, and independent designers inside design studio classes. For this research, the next step applies this learning theory within the design studio curriculum.

The researcher is interested in finding a strategy,

1. Enhancing design excellence skills in design class course,
2. Adding to the current learning environment of design class,
3. Offering a design tool in the design process fomenting student creative, critical thinking towards design solutions.

Addressing this issue, the researcher channeled her design learning experience in design studio classes under the supervision of well-known architects, either locally or globally, successfully running businesses. She then combined it with her professional background built through years of working in different architecture firms and offices embracing a distinct design process philosophy. Adding to her professional experience, the researcher spent almost five years in the architectural education sector, where she ignited her curiosity on the topic— forming a creative design solution to sell it to clients.

The researcher recalls her well-established professor in a third-year design class, introducing telling something through design. He explained designing does not only embrace the practical and artistic but also design solutions creating mystery and surprise (Box, 2007, pp. 83-84). He declared designers must remain because if architects have passion, people will understand their designs enough to walk through design process harmoniously. Telling something or using narrative in design does not

pose a new idea. Civilization has used architecture historically to reflect its beliefs and traditions. The architect expresses oneself in architecture. As Alberti identify the new professional role of an architect From the Renaissance:

“Him I consider the architect, who by sure and wonderful reason and method, knows both how to devise through his own mind and energy and to realize by construction, whatever can be most beautifully fitted out for the noble needs of man.”

Architects’ buildings reflect how they perceive themselves (self- image). The architecture profession has progressed to understanding the architect behind the object. In the past, the architectural design had to be free from traditions, constraints, and limitations, but, recently, architects have moved from building monumental to bringing their expressive talents to the daily environment. Designing for everyday settings demands sharing values, incorporating changes while maintaining permanence, and distributing design responsibility to deliver an architecture design energetically revealing sophistication and wonder (Habraken, 2003). Using reflection and experience as a learning tool should foster a passionate design experience, and a deep understanding of its process since gleaning experiential knowledge requires narrative rendition for its grasp (Grillner, 2000, p. 214).

Student curiosity finding what they want to tell in their design, as the researcher refers to it as the wow factor, should happen when design studio students reflect on their experiences and outcomes because it creates individual identities relaying life stories. Language, symbols, cultural, and social context form narrate a lived experience.

Collecting what is impossible expresses a single image into a momentarily experienced whole. Representing a lifeform characterizing a time where horizons must be constructed from past, future, and physical reality (comprising both analogical and digital worlds) (Grillner, 2000, p. 215). Additionally, the researcher would like to complement prevailing reflection strategies using a new tool, storytelling.

3.4. Storytelling: The (Wow) Factor Creator in Design Studio

As architects gain real experience, they conquer intermediate language challenges, creating their product beyond representation to actualize architecture. Conversely, while mastering design, learners rigidly adhere to representation, speaking the standard professional dialect to convey their ideas. Since they master the language rudimentarily, students fail to express their intentions. In the beginning, the language syntactically obfuscates student conceptions where the code eclipses the novices' wishes and vision. Hence, perfect representation supersedes reality, diverting students to focus on imageries, not actual architecture (Corona-Martínez & Quantrill, 2003, p. 36) The researcher proposes to avoid compromising design language students must learn reflective skills in design courses using storytelling.

Storytelling as a learning tool stems from learning constructivist paradigms—learning via reflection (Fry, Ketteridge, & Marshall, 2003, p. 11; Saeid, 2001). Reflective theory in higher education has promoted storytelling in instruction. Inter and intradisciplinary faculty have implemented storytelling to inspire student critical

thinking, encourage self-reflection, and reveal practical truths (McDrury & Alterio, 2003, p. 8).

McDrury and Alterio (2003) explained why storytelling as a learning tool effectively achieved more in-depth learning for postsecondary education. While they used storytelling in the medical field, the researcher believed this tool significantly affect student design skills in architecture design studio classes. McDrury and Alterio (2003) played a significant role in forming the researcher hypotheses, adding, modifying, and creating new structures for a learning experience in design studio class and using it as a design tool building on (why? when? And how?) in the design process.

Storytelling generally engenders multiple definitions. “The activity of telling or writing stories” (Dictionary.com, 2019); “the art of telling stories” (Cambridge Dictionary, 2019). Moreover, storytelling depicts a distinctively human experience, conveying events, real or imagined, about a person or others, in words and images, employing improvised hyperbole (McDrury & Alterio, 2003, p. 31). Stories or narratives entertain, educate, maintain the culture, and inculcate morals. Plot-structured tales narrate characters shared with people (Chaitin, 2003).

3.5. Story Structure

Literature encompasses numerous story frameworks, like the three-part story with a beginning, middle, and ending, but a classic story structure comprises five segments: beginning (setting and exposition), conflict (problem), rising action (problem-solving),

highest point or culmination (touching the problem core), falling action (problem resolution), and outcome (how the problem is solved) (Bu., 2017).

3.6. Storytelling Usage

Storytelling epitomizes a powerful tool used for other purposes than entertainment (Fox Eades, 2006, p. 12).

3.6.1. Reflection and Experience learning Strategy

Although storytelling has been incorporated in learning (Fox Eades, 2006, p. 11), recently, it has transformed into a reflective strategy in colleges (McDrury & Alterio, 2003, p. 31), fomenting emotional, social and learning skills improving learning objectives. (Fox Eades, 2006, p. 132). Storytelling elevates intellectual aptitude engaging and complementing reflective reasoning (McKillop, 2005).

3.6.2. Deep Understanding and Meaningful Learning

Reflection, essential to the in-depth learning process, uses stories to relay entertainingly real historical and familial events. Furthermore, it describes a sequence of a learning experience (Fox Eades, 2006, pp. 11-12), reflecting on what the student learned to develop a mature course understanding (Fox Eades, 2006, p. 131). McEwan and Egan's (1995) illustrated a story as a narrative fundamentally makes sense of mind operations. The narrative handles not only fictional ideas and dreams but also reality facts and theories from a personal perspective connected emotionally. Such stories

situate events in narrative contexts, assigning them reflective meaning from which to learn (McDrury & Alterio, 2003, pp. 31-32).

3.6.3. Method of Teaching

When implementing storytelling in learning, prior student experiences, storytelling attitudes, and spirits particular stories entail, together with tales processing, affect how and what is learned (McDrury & Alterio, 2003, p. 47). Identifying the instructor as a listener and the student as a teller or vice versa in a collective learning forum. When the mentor transmits information to passive students in a large classroom, dilute the (Braskamp, 2000, p. 23) the educative and transformative effects stories possess (McDrury & Alterio, 2003, p. 36).

3.6.4. Tools Encouraging Active Imagination

Storytelling uses language as a learning tool to tell and share stories to develop speaking and listening skills, discussion ideas or philosophy, and thinking skills. Stories break student isolation, building social awareness employing an emotional vocabulary. (Fox Eades, 2006, p. 11). Educators use story and dialogue to help students connect with oneself and others, subjects and objects, and opinions and emotions (McDrury & Alterio, 2003, p. 34).

Stories also portray powerful research tools. Storytelling provides a research tool for education, looking beyond superficial data and explanations. Story creatively uses dialogue improving education and therapy because it expands comprehension richly contextualizing information about actors, purposes, and experiences (McDrury &

Alterio, 2003, pp. 34-36). Reason and Hawkins (1988) argued storytelling inquiry involves cooperativeness qualitatively incorporating holistic viewpoints. They also asserted storytelling can be used to elucidate or express; scrutinize or comprehend (McDrury & Alterio, 2003, p. 32). Storytelling about characters undergoing a particular event seeking a satisfactory result mimics investigating a paradigm (McDrury & Alterio, 2003, p. 33),

3.6.5. Emotional Audience Connection

In business and marketing, storytelling employs a factual narrative, commonly using hyperbole to emphasize the theme, to communicate to an audience (Decker, 2019). Business-oriented stories can range from a thirty-minute presentation to a single sentence; however, stories engender these components (Choy, 2017, p. 6):

- Structural: beginning, middle, and end
- Elemental: hero, challenge, journey, resolution, change, and call to action
- Authentic: genuine part of the teller, provoking audience emotion
- Strategic: audience imagination sparking, causing them to relate to the story situation, and motivating them to act.

Sentiments affect decision-making; thus, feelings remain critical to the targeted audience decisions. No matter how well a storyteller relays a tale, told, evoking emotion releases strengthens the purpose. Timing plays a vital role in satisfying the audience, eliciting reactions, and, ultimately, message success. Hence, a storyteller must

intimately know the audience to interject verbiage and emotional correctly, sparking audience attention, engagement, and empathy (Choy, 2017, pp. 7-32).

3.6.6. Tool in Design Thinking Process

Design thinking involves creative problem-solving, engendering a human-centered principle, inspiring institutions to emphasize people shaping, improving products, services, and internal procedures. Design thinking entails three pillars: empathy, ideation, and experimentation. Empathy constitutes comprehending client design goals while ideation spawns many concepts. Moreover, experimentation evaluates design via prototyping. (Nessler, 2017). Furthermore, design thinking epitomizes practice where designers, as well as others, gain understanding and creatively unravel an explicit matter, generally with a business bent (Pressbooks, 2018). Design thinking comprises two application: education, and product design— user experience design.

Educationally, both students and the teacher perform design thinking following this progression: (Pressbooks, 2018)

- Understand: research the topic and develop subject matter familiarity
- Observe: noting the environment, including physical surroundings and human interactions; gathering information about people actions and possible motivation through discussion
- Viewpoint: considering alternate viewpoints to understand the problem better and inform the next phase

- Ideate: brainstorming without criticism or inhibition, focusing on generating numerous ideas emphasizing creativity and enjoying the process
- Prototype: quick prototyping to investigate ideas generated during the ideation
- Test: testing ideas repetitively to determine practical design aspects and identify improvement areas

In product design—user experience design, design thinking is applied in product design, service and experience design, business design, leadership, and organizational change (IDEOU, 2018). The design thinking process creates a user interaction with an interface or project in five sages. Empathies develop a deep understanding of user needs and context. Define forms heterogeneous teams while ideating dialogues conversations. Prototype generates multiple solutions inspected through experimentation; and (5) Test uses a structured and facilitated (Siang & Dam, 2019)

Storytelling in design thinking represents a technique to gain insight from users, build empathy, and access them emotionally. It increases the appeal of what they offer and a rigorous user understanding. Stories epitomize the crux of activities, tools, and methods. (Siang T. Y., 2019) . Via storytelling, the design thinking process integrates user identities to generate possible user experiences to glean empathic insights, allowing the designer to view the user world when producing examples to satisfy expectations, build rapport, surprise with appropriate enhancements, and leave positive, lasting impressions. Eventually, the design should convey storytelling forecasted the target user's multifaceted activities. Story narratives reflect magic mirrors—representing fine-tuned compassion joined with user values—in which users determine

their unique outcomes (Siang T. Y., 2019) Storytelling elements in UX and UX process encompass:

- Reason for the story,
- Main character (hero),
- Start with a conflict,
- Structure,
- Creation of awareness,
- Virality (Nessler, 2017)

3.6.7. Presentation and Selling Strategies

Even if designers demonstrate excellent design aptitude if they do not garner concern for their designs, brilliant representations fail since designers did not market their projects effectively. Storytelling can help the designer develop this ability (Weaver, 2019). In (UX), storytelling offers and markets a product or a service using emotions to entice users. Storytelling intertwines the product into the personal story (Weaver, 2019). As a product designer, the goal remains to incorporate the item into a decisive narrative role. Successfully displaying an object lies in the story is constructed around the item (Siang T. Y., 2019). Finally, successfully demonstrating a product resides in how the designer appears to emit enthusiasm for the work, body language, chosen verbiage, and delivery affects the story others develop about the object, establishing the manner for the whole conversation. (Siang T. Y., 2019).

3.7. Storytelling Unique Characteristics

Storytelling as a learning and design tool within the design process engenders distinctive traits augmenting the learning experience for the learners in the design studio.

3.7.1. Storytelling is Enjoyable

Besides the educational and professional objectives for using storytelling, all-aged people from diverse cultures enjoy it because this activity crafts a jubilant environment positively, evoking feeling within the listener. (Fox Eades, 2006, pp. 13-14).

3.7.2. Stories Solidify Abstract Concepts and Simplify Complex Messages

Designers and enterprises simply and clearly offer effectively branded products and design value. Marketers relay stories to represent the complicated item abstractly. The story relates intangible notions using concrete concepts (Decker, 2019).

3.7.3. Storytelling is Creative

Story epitomizes art, and each artwork discloses its maker to the world (Fox Eades, 2006, p. 14). When developing a story, the creator produces new or recycled narratives, using resources and references gleaned from the maker's social network, culture, or experience (McDrury & Alterio, 2003, p. 36).

3.7.4. Storytelling is Responsive and an Active Process

Frequently, storytelling occurs in a group where spectators either assume the teller or listener role. Tellers and listeners both grow, especially during the dialog in the

processing phase (McDrury & Alterio, 2003, p. 52). The aware teller should tailor the storytelling style and the content in response to listener feedback (Fox Eades, 2006, p. 15).

Listeners do not passively receive the story, but they actively engage in creativity. (Fox Eades, 2006, p. 15), molding the storytelling and engaging tellers in reflective dialogue. Listeners can markedly affect dialogue through reflective questioning. Listeners transform into co-authors advancing from the activity. Multifaceted listener learning may transpire through involvement in various storytelling processes, listening to teller experiences (they may have encountered) and engaging in reflective discourse (McDrury & Alterio, 2003, pp. 51-52).

3.7.5. Storytelling is Inclusive and Flexible

Stories simultaneously work on multiple planes where listeners glean from them what they wish, achieving multilevel learning experiences ranging from superficial to comprehensive understanding (McDrury & Alterio, 2003, p. 45). Since a story varies depending on the listener and purpose, storytelling reusing a plot develops unique, unreplicable products (Fox Eades, 2006, p. 16). Even though storytelling resides on tellers and listeners, fundamentally the teller's perspective drives the narrative, for tellers choose the included and excluded components, determine the presentation, and control emotional involvement (McDrury & Alterio, 2003, p. 47). Furthermore, as a storyteller evolves, the master intuitively adapts seamlessly (Fox Eades, 2006, p. 16). Moreover, tellers and listeners can switch roles when the listener assumes the narration

to alter viewpoint and refine storytelling expertise (Fox Eades, 2006, pp. 20-21). Choosing story medium (printed, articulated, or drawn using images, audio, or digital animation) further represents storytelling's malleability. However, notably, storytelling precedes story composition (Fox Eades, 2006, p. 17)

3.7.6. Storytelling is an Emotional Event

Stories cover human emotions and happenings (Fox Eades, 2006, p. 16), sometimes powerfully liberating an individual, but not always. Impactful, engaging stories united the listener with personal experiences thematically, socially, or culturally (McDrury & Alterio, 2003, p. 47). Hence, significant learning materializes when a learner links factual data with emotions.

3.7.7. Storytelling is Transformative

Transcending the informal discourse, the student must focus on the learning process, formalizing storytelling. Formal storytelling encourages dialogue, valuing effective responses and investigating alternatives to practical issues. Listeners vitally affect progression (McDrury & Alterio, 2003, p. 51).

Thoughts on Storytelling: Storytelling, a versatile, multilayered and intricate human resource within individuals, surfaces throughout one's life (McDrury & Alterio, 2003, p. 59). Storytelling foments professional practice learning, inspiring reflective learning and reasoned practical change. When tellers and listeners work formally and collaboratively to construct knowledge using reflective dialogue, they encourage change. While mindful storytelling choices and goals empower learners to maximize

performance, the same storytelling experience may elicit different tellers and listener responses. What they bring to and glean from storytelling depends on many components, like how storytelling is presented as a learning tool and related management.

“In conclusion, storytelling as a learning tool emphasizes the way the story promotes self-understanding, reasoning, passion, and action to reveal cultural significance, as well as offers a research tool (McDrury & Alterio, 2003, p. 36). Moreover, stories empower people to experience others’ worlds and daily circumstances (McDrury & Alterio, 2003, p. 36). Since storytelling fosters learning to develop professional practice, mindful thinking can alter practice when tellers and listeners work collaborate formally to generate knowledge using processes encouraging reflective discourse (McDrury & Alterio, 2003, p. 59).

IV. CASE STUDY: DESIGN STUDIO

In this section the researcher will integrate the given analysis and literature review together to come up with a proposed teaching methodology addressing Storytelling as the main reference in designing the class assignments, tasks, submissions and evaluation. After the proposed teaching methodology is approved, the researcher will design a teaching methodology pilot for in-class testing. In this stage, the researcher will evaluate the proposed teaching methodology and analyze in efficiency and deficiency which later to be amended, changed and resubmitted again until a final version of the proposed methodology to be approved. The testing and evaluation stage will be conducted with agreement with Okan University.

4.1. Definitions and Factors of Experiment

The first stage is the data collection. This stage data is collected by two different approaches. The first approach is the observational part in which data is taken by researcher class attendance and the second approach is directional where students answer major questions based on the observation.

4.1.1. Observation Related Definitions

The following are Important definitions for this Phase, these definitions were put by the researcher after reading the literature reviews and connecting them to the experiment goals.

(1) Design Studio Shortcoming and Challenging to Observe

Referring to the literature review, the researcher divided these shortcomings into two sections, to facilitate the analysis process later. First Part is: Architectural Education Culture, and the second is: Student Design Skills.

- Part 01: Architectural Education Culture

Under this category, the researcher observes and documented skills are related to the learning process in design studio, like (1) Teaching Style and Communication, (2) Feedback and Discussions, (3) Student Verbal Skills presenting Ideas, (4) Students Written Skills for Presenting Ideas, (5) Design Project Schedule and Tasks , (6) Useful use of Data Collection and Analysis.

- Part 02: Student Design Skills

For this category, the researcher observed, and documented strength of skills related to design process learning, like (1) Design Process Understanding, (2) Creative Problem Solving, (3) Defining Project Problem, (4) Concept Creating process, and (5) Design Decision Making.

(2) Phenomenology Theory

A description of An Event, Activity, or Phenomenon, using a combination of methods to understand the meaning participants place on whatever's being examined. The researcher relies on the participants' own perspectives to provide insight into their motivations.

(3) Culture of Architectural Education

the culture of architectural education involves the use of the design studio to educate students and the use of a teaching pedagogy depending on the institution. Design studio is where a student learns to design; and design is considered the key activity for an architect

(4) Design Studio Environments

The physical environment, students explore a set of skills with or without the presence of the instructor. Students primarily taught three aspects of design education: (a) “a new language,” (b) “a number of new skills such as visualization and representation”, and (c) architectural thinking.

(5) Critical Thinking

the ability to think clearly and rationally, understanding the logical connection between ideas. And to be able to engage in reflective and independent thinking

(6) Creative thinking

Applying imagination to finding a solution. Creative thinking embodies a relaxed, open, playful approach and is less ordered, structured and predictable than critical thinking

(7) Design Thinking Process

Design Thinking Process refers to creative strategies’ designers utilize during the process of designing; it is a design methodology that provides a solution-based approach to solving problems which will help Taking Design Decisions

4.1.2. Observation Factors

(1) The Sample

After the researcher prepared the observation phase methodology. The researcher is interested in finding suitable sample of architect students to observe their learning of design process and design skills in design studio environment. After attending multiple design studio from different level for the first two week in the beginning of fall semester 2016-2017. The researcher focused on two design studio classes. The first class is design studio (03), there are 21 students, and the second sample is design studio (04), there are 20 students, both are in English.

(2) Tutors of this Design Studio

The tutors of these classes are faculty member and all of them are Turkish nationality, influence in English, their expertise vary from architect professors to established architects. The researcher herself is not involved in any level in design studio teaching process.

(3) Timeline of The Design Studio Course

The semester is (14) academic weeks before the final jury day for all design classes. The observation duration is for (9) academic weeks. In each week, there is two design studio classes, on Mondays and Thursday except, in total (16) design class before final jury day. Class hours are from 13:00 till 17:00 pm. This time schedule was provided by the architecture department in Okan university, the course outline activities were designed by classes tutor. The researcher has no input here.

(4) Communication Language

Most of the sample are Turkish nationality, although course language is English, the language that been used to communicate is Turkish except when the tutors had to deal with international students. The level of English proficiency- especially the verbal skills, varied significantly between students.

(5) The Learning Environment in the Class

these design studio classes to place in one large classroom, this is a tradition within the architecture department, which create chances for students from different levels to mingle. but in overall it in line with traditional teaching in design studio.

(6) Sketch Design to Evaluate Student Current Design Capabilities

One of the purposes in observation phase, is to evaluate current students design excellence skills within this sample. But for more detailed diagnose of this sample design capabilities, the researcher attended a design sketch exam designed by one of the tutors for both classes. The goal is to evaluate the current level of design capabilities of the students without any interference from the researcher. The exam was to design two story houses of 200 m², no project brief was provided. location was designed by the teacher for the purpose of this exam only.

(7) Sketch Design Exam Evaluation Questionnaire

The researcher prepared questionnaire (01) to evaluate the current level of design skills on students in these classes, the questionnaire consists of 12 questions. It was filled by students after they finished their sketch deign exam, then my some of their teacher, and finally by the researcher. This questionnaire covers :(1) Understanding of

Design Process, (2) Critical Thinking, (3) Creativity in Concept Finding & Critical Thinking, (4) Independent Thinking-Strong Design Decision Making, (5) Ability of transforming information in coherent manner throughout Design process, (6) Student Design Culture & Emotional Connection with Design. This same questionnaire will be used before starting phase 02 of this experiment.

Table IV.1. Questionnaire 01: Sketch Design Exam Evaluation

| | | |
|--|--|--|
| 01- The Student start working in clear design thinking process? <input type="checkbox"/> Y <input type="checkbox"/> N | 05- Design concept inspiration is <input type="checkbox"/> Functional <input type="checkbox"/> Everyday Life <input type="checkbox"/> Artistic <input type="checkbox"/> Theory <input type="checkbox"/> Symbolic <input type="checkbox"/> History <input type="checkbox"/> Narrative <input type="checkbox"/> Abstract Concepts <input type="checkbox"/> Functional with a Twist <input type="checkbox"/> Personal Experience | 09- it was easy for the student to defense his/her design decisions both in written statements and verbal discussions (Feedback & Jury)? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 02- Did the student benefit from provided information of project program and description to get initial design ideas? <input type="checkbox"/> Y <input type="checkbox"/> N | 06- Concept inspiration enrich design uniqueness? <input type="checkbox"/> Y <input type="checkbox"/> N | 10- it was easy for the student to express the concept visually? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 03- The Student started designing by referring to an Idea <input type="checkbox"/> Y <input type="checkbox"/> N | 07- Did the student present clear concept statement? <input type="checkbox"/> Y <input type="checkbox"/> N | 11- the final output (visual language) reflect the concept? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 04- the student knows the difference between "an idea" and "a concept"? <input type="checkbox"/> Y <input type="checkbox"/> N | 08- it was easy for the student to defense his/her concept choice? <input type="checkbox"/> Y <input type="checkbox"/> N | 12- the concept reflect the student Perspective of design? <input type="checkbox"/> Y <input type="checkbox"/> N |

(8) The Main Design Project

The Project outline was designed by class tutors within the guideline of the department goals, like urban transforming, protecting existing social fabric. All notes were collected within the given project scope offered by the teacher. The project focused on the urban design rehabilitation sector for social life and physical environment in the historical district of Kadikoy, Istanbul. Students were asked to conduct a full site analysis in addition to information gathering of the chosen area. The

exercise aimed to present ideas of what new functions and ideas the area needs and what serves the inhabitants in there. The outcome of the exercise was to suggest a proper design solution.

(9) Data collection

In the phase the researcher collected quantitative and qualitative data by using the following method tool:

- Written Description of Students behavior in Design Studios 03 and 04 and their design progress development
- Photos of Students Design Progress submissions, models, design works and sketch design outcomes.
- Informal One to one interview with Students
- Class Tutors feedback
- Questionnaire 01: Sketch Design Exam Evaluation (Done by researcher and tutor, then by Student after the exam)

(10) Data Collection Analysis

In reference to the research goals, the researcher aims to help students get ready for professional design practices and the same time, to learn to create design solutions. (Corona-Martínez & Quantrill, 2003, p. 170) The researcher believes in the possibility of connecting architecture as a practice-based industry to the studio design class and frameworks within. As a result, the analysis focused on the similarities among both the

practice of architecture design skills and learning architecture design rather than marking the differences and problematic results. (Fisher, 2000, p. 119)



Figure IV.1. Videos of Design Studio 01 Jury- Okan University

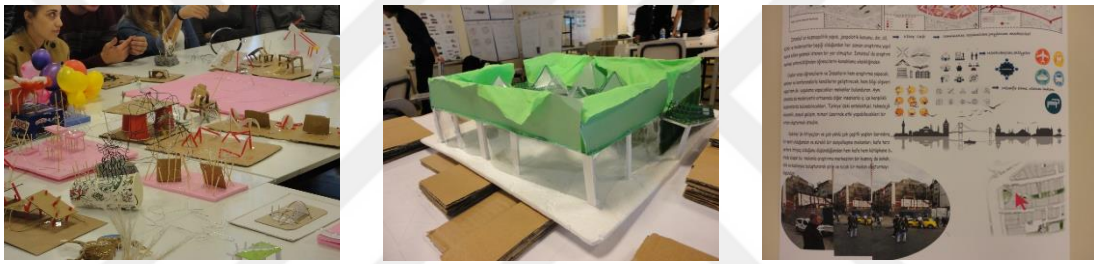


Figure IV.2. Work Samples - Architecture Department – Okan University

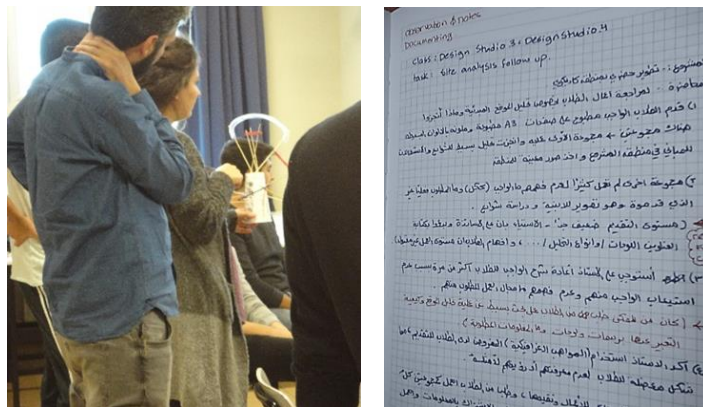


Figure IV.3. Attending Design Classes in Okan University and Taking Notes by Researcher

4.1.3. Applying Storytelling Related Definitions

These definitions were put by the researcher after reading the literature reviews and connecting them to the experiment goals.

(1) Models of Storytelling application in Design Studio

As mentioned before regarding the multiple uses of storytelling in different sectors and how this tool should be flexible to be used within the design studio learning environment, the researcher puts storytelling in use in two models: the first model is regarding the teaching of design skills and process in the studio, this means some extra exercises will be implemented in the course outline and design task. The goal here is to achieve better understanding and learning experience. The second model of applying storytelling is in the design process. The researcher should use storytelling as a design tool that will help students to be more connected to their designs and creative in their problem-solving approach, then to improve their presentation skills regarding defending their project and connect to their jurors.

- *Model One: Teaching and Learning Model*

The researcher designed a general teaching model built on literature readings and previous design tasks she conducted in other universities she taught design courses in. the model criteria are: a) creating a design task that has a brief from a client, b) the location of the project should be unified between all students, c) the function of the project should be unified too, and finally d) no architecture style should be forced on them . the reason behind unifying some of the major elements of the design project, is it will give the juror and the student a fare judgment relating their design outcome by

minimizing the changing factors. In this way, students will be forced to work harder to distinguish their project from each other, on the other hand, the tutors with the jurors can focus more on the project design outline after passing a certain stage in the design process, and then they can compare between the outcomes for evaluation.

One of the storytelling tools the researcher implemented in the class routine was the personal notebook. The researcher gifted her student small but colorful notebooks, to be filled with thoughts during the first phases of the design process. These notebooks were included in the final evaluation of student improvement. The students were guided on what to write in these notebooks and when. Their observations, experiences (good or bad), first impressions, personal feelings, ideas, events or any information they were interested in while being part of an event. They had the freedom to express these notes with sketches, photos, writing notes or paragraphs.

Another teaching tool related to storytelling in the design studio is to use it as a medium of transforming information from the researcher to her students within the class. By sharing stories from her work experience and to listen to their thoughts about what they heard and if they have related experiences they can share. In this way, the researcher builds a positive interaction in the class.

The researcher guided her student to use storytelling to reflect on their experiences, personal or in general when they finished participating in an event related to the class, students as storytellers and the researcher as the listener, to answer her questions which covers the (why? What? and how?). Students will reflect in many stages, verbally then written then by drawing sketches. In each stage the researcher's questions will focus in

more details or emotions they might experience, then to lead them to explain some facts by connecting different notes and data together. Most of the above exercises will take place in form of an open discussion and one to one. By doing so, the researcher helps them to practice their verbal and presentation skills to overcome shyness and build their self-confidence toward their ideas and to learn how to connect with their audience.

The researcher was interested to know the design skills background of her students before starting the experiment, so the researcher prepared a sketch design test for the class and a questionnaire, both of which will cover skills that the researcher is interested to address for this research. This will give the researcher ideas related to what skills they already have, their definition of design process and how they decide on designing and where the improvement should happen.

To evaluate the expected improvement of students, design excellent skills, the same questionnaire will be presented at the end of the semester, and another questionnaire will be presented to juror members to fill after discussing each student in their final jury. The researcher here will have no input in any of these questionnaires or as a design juror in the final jury day.

- *Model Two: in Design Process*

It is important to point out the role of the researcher in design process will be minimized, the researcher will play the role of the listener and the students will be the storyteller. The researcher will give her opinion regarding if the student as a storyteller convinced her with their design reasoning and design decision. In this way, any

undesired design culture transitions between the researcher and the student that might affect their creativity will be prevented. In the other hand, when the researcher minimize her involvement in design process to just follow up the development and just to insure that the students are in the right path within the process according to their stories choices, the students will rely on them self to finds design solutions and to take design decision, in this way they will be responsible for their designs and the final outcomes.

Another point the researcher is interested to achieve by using storytelling is to teach her student to think in critical way with some creativity towards their design solutions , this can happen if the student were able to reflect freely on an experience within a social and culture context and alter their point of view. But, for the purpose of this research, the resources should have some limitation, this does not mean to put boundaries on design inspirations, but rather to control on factors that can affect the design evaluation.

As mentioned, storytelling is used in design process, but it is used after the creation on the product and sometime only as a selling strategy. if we reflect this to design process, we can see that the same problem happens by using storytelling to sell the design rather to create it. The researcher is interested in using storytelling as a design tool that helps in creating the object, not justifying it after it finished. storytelling should create the wow factor in the project and helps the students to reflects their design preferences, backgrounds, and values in clear messages and point of view regarding their community or culture.

(2) Design process

There is different definition of design process and its phases. understanding the design process is usually accomplished through a hands-on learning process, through project-based assignments. Where this process allows students to think, learn, and do at the same time. the researcher thinks of design process definition, after referring to literature readings and connecting it with design thinking process, should be the invention of a new object and to think of it as creative problem solving. It can be divided to main stages in reference to the creator design thinking, to request for information, inspiration, artful resolution, and a means of expression.

(3) The Teller and the Listener

The teller is who organize the ordering contents of a story, and the listener who response to it. this way, the rolls between these two parties can be changes according to the circumstances related to the design process and its teaching. But mainly, the role of the teller with be performed by the students.

(4) The story

“story is presented from the teller's perspective. Motives, ideas, words or events depict their point of view and are substantiated through tone of voice, points of emphasis and gestures. Tellers choose which elements will be included and excluded and how they present their stories. Tellers also determine what level of affective involvement they will reveal.” (McDrury & Alterio, 2003, p. 47) Students as storytellers will decide on what story they want to tell and then to build their design on. The researcher will help them in finding their stories by engaging with them in deep

discussions regarding their findings and fact. In this way, the researcher will lead her student to explore different stories and their set of characters and what the outcome might be , this will improve their creativity in finding solutions and because it will reflect their design preferences in indirect way , will be unique it terms that the approved story for each student will have his/her design personality and emotional connection.

(5) The Process of Finding a Story

Best stories are built on facts. The researcher wants to utilize this step to break the isolation that happen in design process between the designer and the culture and social context to lead students for better understanding of the design process and its requirement from professional point of view to avoid the problems mentioned before. Finding these stories will come from research, data collection and other sources that is related to the design task.

This step is important to improve students design creativity, the goal here is to teach the students who to look and find stories that will add to their design and not just fix it. to ensure that students will learn from this step, the researcher will add exercises that will achieve deep understanding and meaningful learning of this step and its relation to other elements of design process, and it will be presented in many forms.

(6) Storytelling Process in Design Studio learning

For the purpose of this researcher, the researcher will use Janice McDrury and Maxine Alterio (2003) the five-stage learning through Storytelling approach, which are: (1) story finding, (2) storytelling, (3) story expanding, 4) story processing, 5) story

reconstruction. but, redefine these stages to be used within the design process and as a learning environment tool.

(7) Storytelling as a Design Tool

Storytelling in design process as a tool, student will use to : (1) reflect on an experience related to design process, (2) to tell a story s/he choice to use in design process , 3) Which elements of the story will be included and excluded , 4) will help in creating a unified theme for the project, and 5) a communication strategy to sell and defined their product.

(8) Storytelling: Concept Creating in Design Process

storytelling is a creative process and it helps in broaden students' point of view. The researcher wondered in what stage in design process storytelling as a design tool have the greatest impact on improving student creativity towards problem solving. To achieve this, the student should learn to thing in a critical way. This happens when the student dismembers then reconnect these findings from a learning event. If we looked to the UX and business uses of storytelling in design thinking, they use it after the existing of the product or the service to market it to their targeted audience. This is not the case here; the researcher wants to use it to create the object too. So, the first conclusion is, that storytelling should be implanted in the early stages of design process.

The next question was, before or after what in the early stages. As it's known design process can be divided to many phases, generally, can be categories in simple 4 phases: (1) programming, (2) Schematic Design, (3) design development, 4) construction documents. (Jenkins, 2018). Relating what the researcher concluded the

previous paragraph, storytelling should be used in the first two stages. programming in all about building needs, laws, zone regulations and project program, so, storytelling might be used as a tool of processing these dates and understanding, it should be used in the second phase the schematic design.

But, in schematic phase, “the focus in the architectural design process shifts from what the problems are to how to solve those problems.” (Jenkins, 2018) in another words, the (concept) of the design. “Here, minor details should be ignored to instead focus on creating a coherent solution that encompass the project as a whole.” (Jenkins, 2018).

The researcher then addresses, what relation will be between project concept and storytelling. To answer this question, the researcher needed to identify what concept is and how designer create and used them.

“What is a "concept"? in general, a glance at Webster's dictionary confirms our suspicions: 1. A thought, an opinion. 2. In Philosophy: A mental image of a thing formed by a generalization from particulars; another definition is concept is an idea of what a thing in general is to be; and in Design concept means ‘an abstract idea’, The ability to think in terms of abstractions is one of the most powerful tools man possesses (Hunt, 1962, p. 1)

for a designer, it is a broad umbrella of steps of how to ‘ideate a design’. It involves research, analysis and thorough understanding of end user. In another words, concept is a general idea used to formulate a plan, and in architecture a concept is 'an approach' to the design which translate the non-physical design problem into the physical building

product. It's how you plan on solving the design problem in front of you. It's the underlying logic, thinking, and reasoning for how you'll design the project "Conceiving a design requires both conceptual skills and basic knowledge." (Box, 2007, p. 89)

The role of (Concept) in Design Process as Smith and Medin explained it allows us to go beyond the information given; and we can infer some of its non-perceptible attributes (Machery, 2009, p. 153), and developing it needs time, research, exploring and understanding the framework the project will be part in (Box, 2007, p. 112) Therefore "The concept is designer most important design decision. Verbalize it and write about it under the concept sketch, a simple list of adjectives can give direction. As designers work on the design and make decisions about it, keeping the chosen concept in front of him/ her mind. It will help to make coherent decisions. Visualize it as a completed building rather than a design on paper." (Box, 2007, p. 85) How does designer choose a concept? what inspiration they might use to create a creative design concept? Concept, next are the major source of inspiration for design concepts:

(a) Symbolic Logic Traditions

Symbolic logic can be taken from "particular traditions: social traditions and lifestyles, construction traditions, dwelling types, patterns of urban life, and, of course, available local materials and crafts that are both practical and visually appropriate for the region." (Box, 2007, p. 36) Such factors create "The realities of structural systems, mechanical and electrical systems, as well as the physical aspects of the site, are assimilated into your concept. These realities are expressed in lists or narratives, or as you begin to get visual in your process, these facts can

become diagrams that might relate well to your physical planning. Testing it in a sketch, a drawing, a cardboard model, or a computer model.” (Box, 2007, p. 86)

(b) Abstract Concepts from Built-up Experience

“Abstraction leads to a different philosophical interpretation of the meaning of concepts and their relationship to the world.” (Radder, March 2002) Abstracting from “hard-earned knowledge from study, travel, and experience to the creative process and you approach the edge of beauty.” (Box, 2007, p. 70)

(c) Theory and History

Another supply for new ideas is “Theory and history which gives an intellectual basis for design. Architectural theorists give designers guidance and new challenges. Philosophers, as well, have given designers a lot to think about. All of this is in support of the creativity and sensitivities of pure art. (Box, 2007, p. 157)

(d) Narratives / Story Telling

“In many cultures of the past as well as in some present ones, myths, particularly those of a spiritual nature, have been the dominant form-giver. Architecture is intrinsically romantic. Myths of a spiritual tradition were expressed in architecture. Buildings can tell common stories that create a level of extra meaning that would enrich the experience of living in it or use it. The hypothesis is that a connection can be made between the architecture and the person experiencing it, provided they are open to it. Architecture's form, space, and iconography can communicate ideas, tell histories, evoke emotions, enhance spirituality, and create

a sense of place. The stories have beginnings, middles, and ends. They help give form to the building.” (Box, 2007, p. 124)

So, the power of Concepts in design it helps the designer to define the form, the spaces, the light, the movement ... etc., which will become a schematic design that the designer develop and refine. The goal from developing the concept is to satisfy the client's program of need, desire, and budget in a way that will enhance rather than damage and make the client, user, and public grin with pure pleasure. (Box, 2007, p. 84) and, “Myths embedded in architecture give information, communicate ideas, explore mysteries, provide guidance, imply meaning, and provoke thought, even awe.” (Box, 2007, p. 125) story and storytelling through design elements will be reflected in symbolism, iconography, color and mood, composition, style and typography. (Pixar in a Box , 2017).

(9) Application Storytelling within Design Process

Storytelling as a design tool will be added between programming and schematic design as it will generate project concept creation.

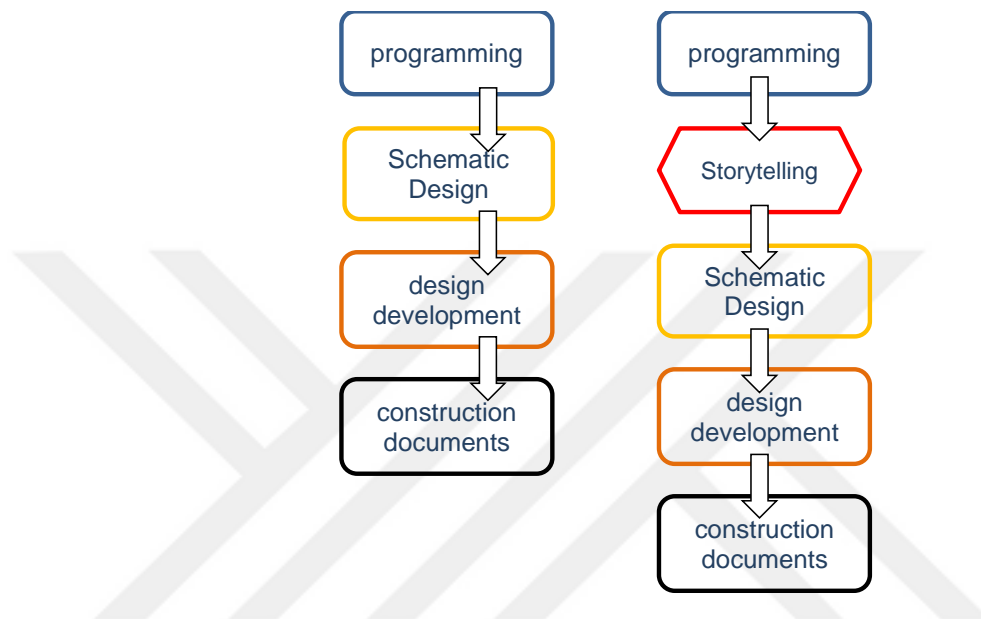


Figure IV.4. Design Process Before and After Adding Storytelling as a Design Tool

(10) The Five-Stages of Storytelling for Concept Creating (by researcher)

The new definition of the five- stages of storytelling as a design tool in design process will be as follow:

- Story Finding: Feedbacks, data, emotions, past or current experience, motive, ideas, words or events students feel urgent need to tell about after engaging in related design event, then they conduct deeper research to collect data and related information to analyze and reflect on them.

- **Storytelling:** Student organizing and ordering which elements, ideas, or events to include or exclude in their story that will help them to express verbally their memories and their perspective
- **Story Expanding:** making meaning of the stories being shared. Questions are asked repeatedly, important aspects expanded on, details and feelings clarified. “Why?” this story important
- **Story Processing:** Deeper understanding – working with meanings, words, ideas to develop, through reflective dialogue, multiple perspectives of (Characters, worlds & references) to explore and use in building design visual language.
- **Story Reconstructing:** asking (What if?) to convey words visually. What if questions invite the imagination into How the story references, characters and worlds will be interrogated to become a creative solution of the project



Figure IV.5. Storytelling Five Stages to Create Project Concept

4.1.4. Applying Storytelling Factors

(1) The Sample

After finishing the first phase of this experiment (the observation) stage of architect students in design studio from different levels in Okan university, faculty of art, design and architecture department of architecture, the researcher concluded that there is shortcoming in student design excellent skills. So, the researcher was interested to apply her theory on real sample of student in design studio course to see if using storytelling in design studio will improve their design skills.

Having prepared the teaching methodology, the researcher for this phase, focused on one sample of students from the previous sample of student in the observation stage. the chosen sample were 12 students of architecture design studio (04), in their second year, spring semester 2016-2017, English class and the Classroom number is (501). This group will be introduced indirectly to storytelling as an education tool by using an interactive approach. Students will be subject to design tasks and exercises that they will apply research theory in different stages of design process. Many expectations are drawn in early stages of this phase; however, these expectations have been reviewed and updated according the student's responses.

(2) Tutors of this Design Studio

The researcher herself and a tutor from the department, the tutor and will be referred later as juror number 01, in time of this research was a Ph.D. student, in final stages of her dissertation. she is Turkish, but influence in English, her experience is largely built through the academic sector. She enjoys researching and experience new

design ideas, she played a great role in helping the researcher conducting the experiment.

The researcher is from Jordan and living in Istanbul, Turkey for the last five years. The researcher been involved in the practice sector of architecture since 2001. Then combining practice with education experiences since 2010, when she became member in the architecture faculty and the manager of an architecture office in one of Amman well-known private university.

(3) Timeline of The Design Studio Course

The experiment duration is for whole semester (17 weeks), 14 academic weeks and one week for midterm holiday and 2 weeks for final exams. For design course it will be 14 weeks in total before the final jury day for all design classes. In each week, there is two design studio classes, on Mondays and Thursday except one class for a holiday, in total 27 design class before final jury day. Class hours are from 13:00 till 17:00 pm. This time schedule was provided by the architecture department in Okan university, the researcher only modified the course outline activities.

Table IV.2. First 8 Weeks- Design Studio Course for Spring 2017

| #No of Weeks | Day | Date | Design Studio Activities | #No Of Classes | Notes |
|--------------|-----|-------------|--|----------------|------------------------------------|
| WEEK 01 | Mon | 30.01.2017 | Beginning of spring semester - General meeting | 2 | all students attended |
| | Thu | 02.02.2017 | General Meeting with students | | |
| WEEK 02 | Mon | 06.02.2017 | Discussion of Class Design 04 Project | 1 | Project program provide by faculty |
| | Thu | 09.02.2017 | Sketch Design Exam + Questionnaire | 1 | For current skills evaluation |
| WEEK 03 | Mon | 13.02.2017 | Site Visit | 1 | Dividing students to groups |
| | Thu | 16.02.2017 | Presentation of First Analysis | 1 | |
| WEEK 04 | Mon | 20.02.2017 | Students choose of project lot, project facilities, area studies (in general), bubble diagram and zoning | 1 | |
| | Thu | 23.02.2017 | case study analysis (international & domestic 3 each. Site Analysis conclusion (constrains and Potentials) | 1 | |
| WEEK 05 | Mon | 27.02.2017 | First Concept Proposal (3 concepts), developed project areas program | 3 | |
| | Thu | 02.03.2017 | Approved Concept Development & site model | | |
| WEEK 06 | Mon | 06.03.20187 | Concept Development with related program areas, bubble diagram & zoning | 1 | |
| | Thu | 09.03.2017 | First Conceptual design on site layout and plans 1:200 | | |
| WEEK 07 | Mon | 13.03.2017 | Developing Conceptual design on site layout and plans 1:200 & conceptual model_ schematic design | 4 | |
| | Thu | 16.03.2017 | development of Schematic design- site plan, plans, program & model (all 1:200) | | |
| WEEK 08 | Mon | 20.03.2017 | Project Plans, Section & elevation | | |
| | Thu | 23.03.2017 | Developed Project Plans, Section, elevation and model | | |

Table IV.3. Last 7 Weeks-Design Studio Course for Spring 2017

| #No of Weeks | Day | Date | Design Studio Activities | #No Of Classes | Notes |
|--------------|-----|------------|---|----------------|-------|
| WEEK 09 | Mon | 27.03.2017 | Mid Term Jury | 1 | |
| | Thu | 30.03.2017 | revision of feedback from jury day | 1 | |
| WEEK 10 | Mon | 03.04.2017 | First presentation of Plans, section & elevation in (1:100) scale | 2 | |
| | Thu | 06.04.2017 | Plans, section & elevation (1:100) | | |
| WEEK 11 | Mon | 10.04.2017 | Spring Break | 0 | |
| | Thu | 13.04.2017 | Spring Break | | |
| WEEK 12 | Mon | 17.04.2017 | Development Plans, section & elevation (1:100) | 2 | |
| | Thu | 20.04.2017 | Developing Plans, section, elevation & model (1:100) | | |
| WEEK 13 | Mon | 24.04.2017 | detailed plans, sections & elevations (1:50) | 2 | |
| | Thu | 27.04.2017 | detailed plans, sections & elevations (1:50) | | |
| WEEK 14 | Mon | 01.05.2017 | Holiday | 0 | |
| | Thu | 04.05.2017 | Final Design Development and representation Technique | | |
| WEEK 15 | Mon | 08.05.2017 | Final Design Development and representation Technique | 3 | |
| | Thu | 11.05.2017 | Final Design Development and Questionnaire | | |
| WEEK 16 | Mon | 15.05.2017 | semester final exams | 0 | |
| | Thu | 18.05.2017 | semester final exams | 0 | |
| WEEK 17 | Mon | 22.05.2017 | semester final exams | 0 | |
| | Tus | 23.05.2017 | Design Studio Final Jury Day for all Design Classes | 1 | |

(4) Communication Language

The sample is consisting of twelve students (12), the majority are Turkish nationality (10) and two international students, one is Iranian and the other in Palestinian. As the researcher herself from Jordan, the language that been used to communicate is English. The level of English proficiency- especially the verbal skills, varied significantly between the Turkish students, this causes some extra work from both the researcher and the tutor to ensure that all her students understand what has been explained or what homework's required by them. Sometimes this process was time consuming. Students where always Encouraged to speak and present their ideas in English, especially if they were weak in it, the researcher and the tutor insisted on this.

(5) The Learning Environment in the Class

The researcher working experience gave her great advantage in knowing what design skills to focus on in design leaning, and how business works in architecture firms. "There are two ways of approaching the cross-curricular use of stories. One is to start with each subject and then look at how stories and storytelling might add richness and depth to students learning. there are discussions of stories and thinking skills, the other way of thinking about the use of stories across the curriculum is to start instead with the story itself and to think about how a story might enrich each subject in turn." (Fox Eades, 2006, p. 105). To do so, the researcher applied storytelling within an alternative learning environmental context, that reflects the real realm of practicing architecture.

The researcher introduced her students from the beginning of the semester the idea of design studio becoming as an architectural office. where she and the tutor represent the client / manager of this office and her students are the employees. This led the researcher to adopt strict but fair approach of teaching in design studios. professional working ethics, like attendance on time, professional communication, data research and project brief, student responsibility towards their work, and scope of design work become necessity. in the same time the researcher gives her student full freedom of choosing their design ideas or styles, expressing their thoughts or complains to be discuss openly in class, and provide continuous follow up and thorough submitted work revision.

Storytelling was used by the researcher as a Transformative method to achieve better learning experience and deeper understanding of the work environment in an active dialog, where the researcher becomes the storyteller and the students become the listeners. When asked by her student profession related question like, solution of a design problem or taking design decision or how to present themselves. The answer where embedded in stories the researcher shared with them, either from her personal experience or from her imagination. after sharing the story, the researcher starts to ask the student if s/he can relate to what they just heard, and if the answer was yes, the researcher asked them what the answer was and why?

Another way for using storytelling to answer their question, is by asking them to imagine themselves in the opposite side of things. if you where the client or the user, would you approve this design? Can you understand my presentation of the project?

Here, the student will try to seek the answer from different point of view by rotating between the storytelling two parties.

(6) Data collection

In the phase the researcher collected quantitative and qualitative data by using the following method tool:

- Sketch Design Exam – Before Starting Design Teaching
- Written Description of Students behavior in Design Studio 04 and their design progress
- Photos and samples of Students Design Progress submissions and design works
- Informal One to one interview with Students
- Students Notebook
- Tutor / juror 01 Notebook
- Student progress report by researcher and juror 01
- Questionnaire 01: Sketch Design Exam Evaluation (Done by researcher and tutor, then by Student after the exam)
- Questionnaire 02: Jurors Feedback (Done by Other Tutors not the Researcher)
- Questionnaire 03: Students Feedback on Applying Storytelling in design class (filled by researcher during informal discussions with students in Final classes)

Table IV.4. Questionnaire 01: Sketch Design Exam Evaluation

| | | |
|--|--|--|
| 01- The Student start working in clear design thinking process? <input type="checkbox"/> Y <input type="checkbox"/> N | 05- Design concept inspiration is <input type="checkbox"/> Functional <input type="checkbox"/> Everyday Life <input type="checkbox"/> Artistic <input type="checkbox"/> Theory <input type="checkbox"/> Symbolic <input type="checkbox"/> History <input type="checkbox"/> Narrative <input type="checkbox"/> Abstract Concepts <input type="checkbox"/> Functional with a Twist <input type="checkbox"/> Personal Experience | 09- it was easy for the student to defense his/her design decisions both in written statements and verbal discussions (Feedback & Jury)? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 02- Did the student benefit from provided information of project program and description to get initial design ideas? <input type="checkbox"/> Y <input type="checkbox"/> N | 06- Concept inspiration enrich design uniqueness? <input type="checkbox"/> Y <input type="checkbox"/> N | 10- it was easy for the student to express the concept visually? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 03- The Student started designing by referring to an Idea <input type="checkbox"/> Y <input type="checkbox"/> N | 07- Did the student present clear concept statement? <input type="checkbox"/> Y <input type="checkbox"/> N | 11- the final output (visual language) reflect the concept? <input type="checkbox"/> Y <input type="checkbox"/> N |
| 04- the student knows the difference between "an idea" and "a concept"? <input type="checkbox"/> Y <input type="checkbox"/> N | 08- it was easy for the student to defense his/her concept choice? <input type="checkbox"/> Y <input type="checkbox"/> N | 12- the concept reflect the student Perspective of design? <input type="checkbox"/> Y <input type="checkbox"/> N |

Table IV.5. Questionnaire 02: Jurors Feedback

| | |
|---|--|
| 01-(site analysis and findings) was enriched by student personal experience in the location <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 06-Strong / clear storytelling by student leads to strong / clear concept explaining <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 02-Reflecting student personal experience in the site analysis helped achieve deeper understanding of project location and characters <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 07-clear creative concept , achieve clear creative design solutions <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 03-The student deep understanding of site- personal experience analysis helped in finding unique story which is connected to this specific project location and characters (story finding) <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 08-The student has his/her own creative design solutions which reflect his/her own story-concept <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 04-Student telling the story then draw it(storyboard), helped to understand the story merits that will be reflect in the next phase _ concept finding <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 09-The relation between story finding , concept development and the final design is strong unique <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 05-Creative story merits ,creates creative concept finding <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 10- The stronger the Storytelling, the more creative is the concept <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| <input type="checkbox"/> Y Yes <input type="checkbox"/> M Maybe <input type="checkbox"/> N No | 11- Storytelling lead to unique design concept that is related to student preferences <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| | 12- storytelling help in achieving Connection between concept merits and the final design product <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |

Table IV.6. Questionnaire 03: Students Feedback after Applying Storytelling

| | |
|--|--|
| 01- did story finding technique help you to be more aware of useful data that you can use in finding ideas and concept creating ? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 06- when applying storytelling as a design tool , did that help break the ice and encourage you to present your design decisions in complete confidence? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 02-when applying storytelling as a design tool in your concept creation, did that help you in thinking outside the box with more ways of problem solving (creative critical thinking)? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 07- writing down your story then draw it and share it with your colleagues and tutors as a story teller in different stages, strength your design presentation skills (writing & verbally)? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 03- when you write down your story then draw it then share it with your colleagues and tutors visually & verbally in different stages, did that deepened your understanding of your concepts merits ? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 08- using storytelling in design thinking , Helped the final output (visual language) to reflect the concept you chose ? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 04- did using the “what if?” As a concept statement technique in concept creation phase help you to present clear concept outline for future design developments? | 09- storytelling help to create emotional connection and bond between you and your design? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |
| 05- “clear storytelling leads to clear concept explaining”. Did storytelling prepare you to present your concept and ideas easier and simpler than before? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N | 10- storytelling as a design tool help reflecting your own design culture and style in project design ? <input type="checkbox"/> Y <input type="checkbox"/> M <input type="checkbox"/> N |

(7) Sketch Design to Evaluate Student Current Design Capabilities

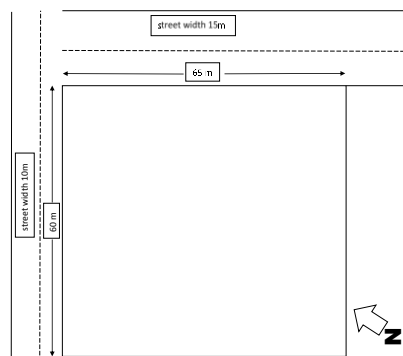
Although problems have been identified from Observation phase, and the current students were part of the previous sample. But for more detailed diagnose of this sample design capabilities, the researcher decided to conduct a design sketch exam designed by the researcher in the beginning of the semester and to evaluate the result using Design Thinking & Concept Finding Evaluation Questionnaire. The goal is to evaluate the current level of design capabilities of the students. For this purpose, sketch design exam was held in the beginning of the course. The exam was to design a kindergarten, this project brief and location are designed by the researcher for the purpose of this exam only. The researcher provided information from design book

referring to child day-care centers be used for analysis of space connection and Hierarchy and to help the students to calculate areas and to understand function relation between different related facilities.

(8) Sketch Design Brief

| | | | |
|---------------------------|--|------|----------------|
| Project title | : Designing a kindergarten | | |
| Project Client | : The Municipality of Mono Mono City | | |
| Project Total Area | : Max. 1000 m ² (not included the plot area) | | |
| Plot Area | : 3900 m ² | | |
| Project description | : the municipality of "Mono Mono" city would like you to design a kindergarten that is focused to enhance children's social life and fostering them. 80 children (40 girls, 40 boys) who aged between 1-3 years will be joining this kindergarten in the first year of the opening. Another 20 children will be added the second year. | | |
| Project plot | : Location is surrounded by two streets (see the site plan below) | | |
| Project Program of spaces | : 3 classroom and nurseries | - | - |
| | Group room and playing area | ~ 45 | m ² |
| | Toilets for children | 60 | m ² |
| | Multi-purpose room (s) | - | m ² |
| | Class for performance activities * 3 | - | m ² |
| | Children's playroom (s) | - | - |
| | Playground (s) | - | - |
| | Lunch area | - | m ² |
| | Kitchen/ Food service room | - | - |
| | Nurse room | ~ 25 | m ² |
| | Faculty room with lounge area and toilets | | |
| | Administration office- manager and secretary | ~ 48 | |
| | parking spaces: 6 cars, 1 school bus | | |

(Note: 1 teacher for each 20 child, and ~ 15 m² space per teacher)



The site plan of the project

(9) Sketch Design Exam Evaluation Questionnaire (01)

The same questionnaire the researcher filled in the observation phase is used here. This questionnaire has been filled to two ways: (1) by the researcher and the tutor to evaluate sketch design outcomes. 2) design class students to reflect on their sketch design experience.

(10) Main Design Project

Although project outline was decided by the department and the nature of the project should address design goals like sustainable architecture and preservation. for the in order to find a common ground for the output evaluation and to give each student the same fair judgment criteria, all students where given the same design program and building function which is a (Musical and Cultural Centre Design Proposal).

The researcher designed a project brief. this brief was written in form of international competition of design that is sponsored by international company - (creating an event for a story), providing design vision of the client for this contest, and who are the targeted sample and how this project will play role in reflecting the hidden

talents in Istanbul. Then, Initial functional schedule with area calculation was provided to help the students in their research phase. But this brief was cut short and the competition approach was objected by the other tutor, as it never done in this way before and the students might not understand it. as a result, a simpler project brief was provided but keeping the idea of a competition and related client.

(10) Project Brief

| | | | |
|---------------------------|---|---|--------------------|
| Project title | : | A Design Competition for New Musical and Cultural Centre | |
| Project Client | : | Save music and culture organization | |
| Project Total Area | : | 2500 m ² (this included the plot area) | |
| Project description | : | A Competition for the realization of a New Musical and cultural Centre in Istanbul, this centre be the new place for musicians (professions or students) to practices, study, and to perform to live audience. Another goal for this centre is to be the new cultural hub for the chosen neighbourhood in specific and to Istanbul people in general, to gather, enjoy experience new things and events and to learn new hobbies. | |
| Project Plot condition | : | Location should be accessible by vehicles for services and fully served by utilities. | |
| Project Program of spaces | : | Main theatre of performance and music concerts | - - |
| | | (500 -1200) person with all utilities | |
| | | Cafeteria | |
| | | Public toilets | 60 m ² |
| | | Music class * 3 | 150 m ² |
| | | Class for performance activities * 3 | 150 m ² |
| | | Classes for total 45 student to attend courses in the same time. Minimum 4 Classes | - - |
| | | Library and internet lab (20 seat) | - - |
| | | workshop room _ multipurpose | 450 m ² |
| | | gallery (s) | - - |

| | | |
|--|----------|----------------|
| Administration Department: Centre Director Office, Marketing Department, Events Coordinator, Offices for staff (4 persons) and secretary. | 100- 150 | m ² |
| Offices for Teachers (6 persons) | - | - |
| Seminar Room (16 person) *3 | - | - |
| Meeting Room (10 person) * 2 | - | - |
| Security office and monitoring room | 12 | m ² |
| Toilets and building utility room | - | - |
| Parking area for Administration staff and some visitors | 10 cars | - |

(note: Project design exercise timeline is the whole semester)

(11) Project Location

Student had the freedom to choose a location- which also where decided from the department, from three of these neighbourhood in Istanbul: (1) Galata neighbourhood, (2) Kuzguncuk, and finally (3) The Princes' Islands - Adalar. The last location was replaced by the Karakoy neighborhood, to have more freedom regarding building regulation.

As the researcher suggests an in-class learning tool, it will be in the research best interest and reliability to start the data observation in real design classes. In this regard, the researcher will attend two design classes on regular bases. The criteria by which the design classes are chosen are as follows:

- Design studio classes where traditional lecturing is the core curriculum.
- Student understanding of design process is initially established.

- Students are familiar with basic architectural terminologies, design elements and principles of design.
- Student with basic knowledge of presentation skills.
- Students with basic knowledge in technical drawings.
- English language classes.

Since the proposed is a new learning tool, the observational data requires different approaches and applications, depending on the level of the design classes agreed on; which by following the previous criteria, it is proposed to be Design studio (4), spring semester 2016-2017. For instance, the researcher will use representative images of the class workplace, physical models, 3D prototypes and sketches of design development (Cowdroy, 2000, p. 25), all to be later analyzed in reference to the students' collective and individual performance.

However possible, the researcher will have to practically pay visits to the class upon projects submission to observe and instantly evaluate students' work submissions, presentation boards, verbal defense and any other medium offered in place. These visits will also casually be paid to other classes outside the selected ones as to overcome any differences in the outcome and to help the researcher collect an overview of how teaching in other classes can be compared and studies in the future.

The researcher will later identify and document each of the collected notes along with photographs of each observation either by visuals, writing or film following a theoretical mechanism by which data collection and analysis is guided; here learned to

be the “Three Stages Guidelines” (Wiggins & McTighe, 2005, pp. 14-19). Moreover, in-depth solo conversations to be carried out with students and lecturers to opt out any misguided observations.

4.2. Experiment Phase One: Observation Data

From this point forward, the researcher will now describe the observation phase and its outcomes and elaborate on the impressions she built upon. The researcher observation covered these points and divide them to two section: (A) Architectural Education Culture, and (B) Student Design Skills. In this phase, the researcher attended these classes to observe only.

4.2.1. Design Studio Learning Environment

(1) Teaching Style and Communication Language

In the class teachers preferred an open verbal communication to explain design process and vocabulary and to describe design process. At the same time teachers gave students the freedom of asking and expressing their design concerns and values (Corona-Martínez & Quantrill, 2003, p. 56). As student “learning requires space for thinking or reflecting 'in your head' and for interaction with others, and learning from and with peers and experts. (Fry, Ketteridge, & Marshall, 2003, p. 22)” which, in Architectural firms, is a must-learn channel. Given the opportunity, students will pass breaking-the-ice stage and immediately learn the office requirement as architect who has to communicate with office colleagues (Wasserman, Sullivan, & Palermo, 2000, p.

15), and to explain designs to the client and to the contractor. (Wasserman, Sullivan, & Palermo, 2000, p. 3) This will help them go through internship smoothly.

The issue here was the spoken language in design studio class. Although the architecture department in Okan university offers English-based courses hoping to attract international students and at the same time giving local students the opportunity to learn other nationalities approaches and languages. Unfortunately, in the design class where English was the base teaching language, most of the time Turkish language was used and only those who do not speak Turkish were expected to ask and demonstrate in English. Foreign students not fully understand public discussions or feedback between the teachers and local students in juries, but also they will force the teacher to explain again to them all the major points as most of the teacher feel responsible towards students (vice versa when using English in class). As a result, more time will be consumed, and ideas must be given twice at least, and the cost of this time loss will affect other students to get the best of what it is expected.

(2) Feedback and Discussions

From a teacher's perspective, education is a two-way ticket. In these classes, teachers gave what they have in separate points and left a space for discussion. One way of discussion happened to be between the teacher and the students. The other way was leaving students to discuss their ideas and interact constructively with any given argument in an orderly fashioned way. This two-way interaction will help empower students on a professional level, most of the modern architectural firms would rather invest in group collaboration and teamwork as it widens the company's capabilities in

providing a wide range of interrelated concepts. Although the idea of teamwork and collaboration was well presented by teachers in classes and time was very critical for teachers to spend for peer to peer discussions, unfortunately many students did not respond to this given opportunity.

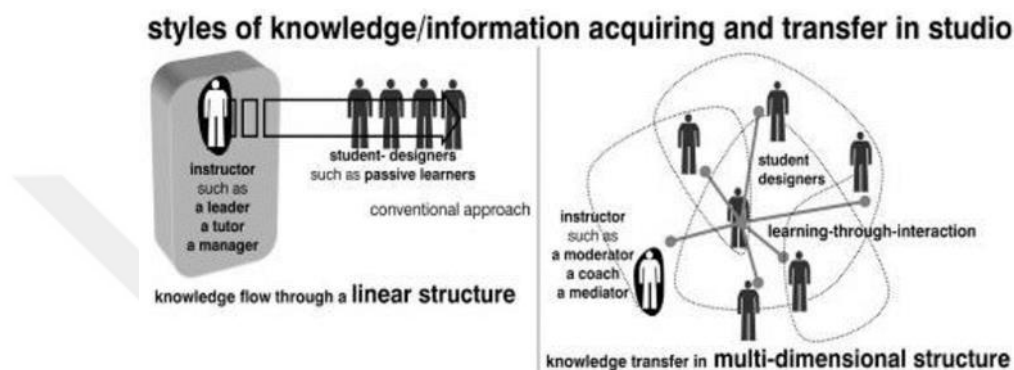


Figure IV.6. Styles of knowledge acquiring and transferring and roles of students and studio-instructor in the studio. (Kahvecioğlu, 2007, p. 20)

The researcher believes that this negligence to such an important communication channel is due to the fact that students give their ultimate attention to their own submission details rather than learning from others, as “students prefer seeing the face(s) of their tutor(s) during tutorials and review sessions” to address their concerns and ideas (Corona-Martínez & Quantrill, 2003, p. 173) and wanted to “see the faces of the critics but were indifferent to the possibility of seeing their remote design partners. These partners were apparently sufficiently represented by their production (Corona-Martínez & Quantrill, 2003, p. 173)”.



Figure IV.7. Group discussion_ Design Studio 01

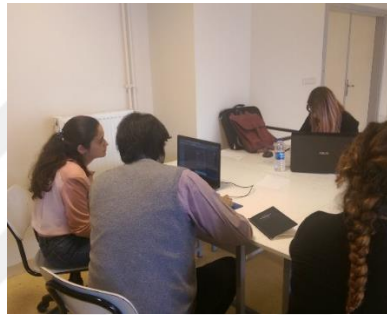


Figure IV.8. One to one Feedback _Design Studio 03

(3) Presentation Skills

Presentation skills is as important as the project itself “The final decade of the twentieth century has given a new strength to the identification between architecture and its representation (Corona-Martínez & Quantrill, 2003, p. 59)”. Many architectural firms now hire graphic designers with architectural background to design the presentation boards because “architects seldom considered working drawings to be creative (Corona-Martínez & Quantrill, 2003, p. 176).

Software like InDesign is used to prepare reports and digital presentations and huge 3D visualization render farms established their business upon the need of

architectural studios to quickly deliver a hyper realistic visual. Yet, architects play the supervisor role of graphic clarification, even if they don't do the job themselves as they are the only ones to decide what to show and what not emphasize on. If the presentation graphic is weak, the project will fail to sell.

Teachers try to boost student's skills to achieve graphic clarification in their submission because project drawings must finally be of the same kind as those conventionally used for representing buildings, that will help the juror to be more "objective" about the design (Corona-Martínez & Quantrill, 2003, pp. 53-54). This method of task orientation is very helpful for students, who are intern architect to be, as it prepares them to be oriented to presentation skills like: boards selecting, size; and many other factors architects should take care of. All must be contextually balanced when a project mood boards are for projects to impress clients, mood boards representing similar projects and ideas are very effective and this job is usually given to intern architects as researchers.

Surprisingly, most of the final submissions lacked the mood boards and referencing. Many students lacked the basic presentation skills and thus weakened their project. Other used unreliable organization of plans and sections. And few students could demonstrate primitive presentation boards. The final submissions of most of the students did not meet the expectations. Many projects lacked the very basics of presentation skills that already been discussed thoroughly in the class. In this regard, the researcher believes that presentation skills are a must-learn criterion in early design

classes. Moreover, architectural presentation structure could be part of the design curriculum.

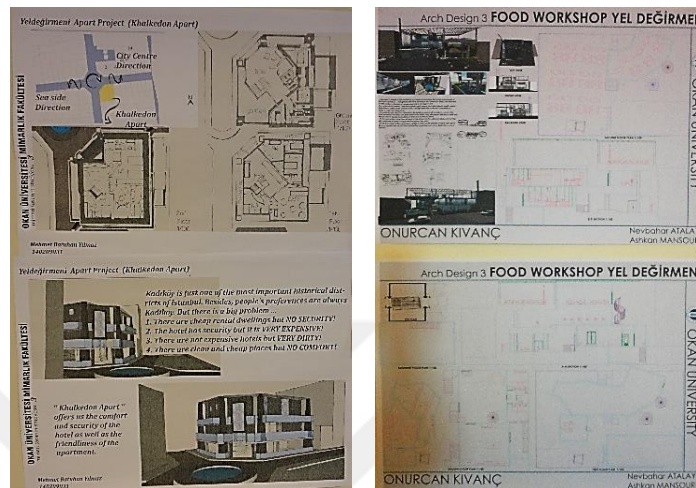


Figure IV.9. Different projects Midterm presentation _Design Studio 03 - Architecture Department – Okan University

(4) Sketching, Drawings, Modeling and Computer Skills

In “Large offices run by established architects make their basic design decisions by hand-sketching and passing these sketches on, as always, to assistants, who are now computer draftsmen. These assistants in turn employ software developed for engineering, for high-definition technical drafting (Corona-Martínez & Quantrill, 2003, p. 172)”. The researcher argues that in order for fresh graduate architects, given the name “Intern Architects”, to achieve a good standing work opportunity, they must graduate in the first place ready to work rather than software professionals (Fisher, 2000, p. 16). Software on the other hand is a tool to be learned due time and should not be dealt with as an investment over the true bases of Architecture.



Figure IV.10. Using computer _Design Studio 03 Architecture Department – Okan University

With the development of software engineering, architecture became more powerful. Architects now differ in their ability to demonstrate quick solutions and with the help of architectural design software, architecture as a service is now available for everyone (Corona-Martínez & Quantrill, 2003, p. 46). Architectural and design programs are helpful, and It will be unfair not to respond to technology. In fact, most of the design firms use programs like Revit, AutoCAD and Sketchup. It is now a major requirement in job applications. However, this doesn't eliminate the fact that students must learn how these programs automate their designs.

Revit for instance is the most demanding software in the market and it became an essential reference for any architect whether they are concept designers or BIM specialists. Revit asks you to provide one aspect of the design and it will analyze the rest for you. An architect can extract elevations, sections, plans, 3D model, schedules and final sheets simultaneously without bothering to change all every time (Corona-Martínez & Quantrill, 2003, p. 177). A minor change in the plan will reflect all the other

design features. Yet, students should know how each of these features was reflected even if automation is available.

While resistance to technology has become a long debate among modern and traditional architects, many would rather suggest a transitional phase where automation is a result of the basic understanding of the function itself. In design classes, if automation is taught without the basic principles of each function, students will have to justify their lack of technical understanding of the project itself and how elevations are interconnected with plans or how roofs work as floors.



Figure IV.11. Computing in Design Studios - Okan University

The researcher believes that the lack of manual skills will lead to a less creative architect and will narrow their understanding of space design and work areas. “space of the problem” happens when design consists of putting on paper what little designer know and, by contemplating the marks they have made, learning more about the solution. Students learn about the possible shapes of their design; learn of the mutual dependencies of parts of all kinds and giving sense to the gaps left between the shapes

designer intended to compose. We will learn more about the object that we are creating, but only indirectly about the problem we are supposed to be solving” (Corona-Martínez & Quantrill, 2003, p. 178) “The computer is not a drawing instrument like a pencil. The pencil is an extension of the mind-hand system. The computer is an intermediate system drawing according to our indications provided by the pressure on the button of a mouse, which in turn responds to the feedback from our sight of what appears on a screen” (Corona-Martínez & Quantrill, 2003, p. 176).

Another disadvantage of using software over manual hand tools that teacher will find it easier to read a student’s project but at the same time more difficult to transmit their own ideas through the student’s hand” (Corona-Martínez & Quantrill, 2003, p. 54). “The role of the teacher in the first studios consists precisely in guiding students to “read” their program graphics as possible architectural representations. Students are making tentative drawings or models; the instructor “interprets” these sketches, suggesting the next step that the students should take to “clarify their ideas.” (Corona-Martínez & Quantrill, 2003, p. 15)

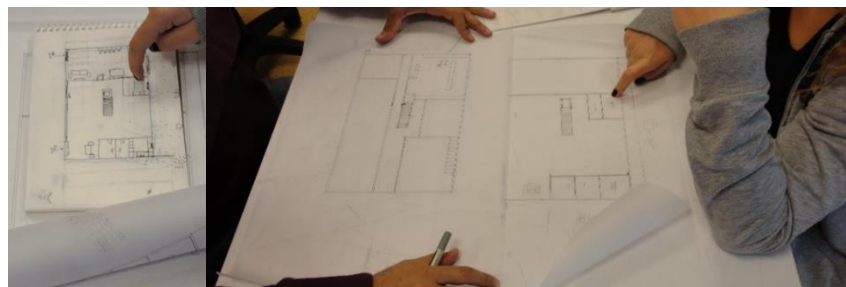


Figure IV.12. Manual Conceptual Sketch in Design Studio 03_ Architecture Department – Okan University

As a result, students will lose their ability to connect the dots in a dimensional design space and thus fail to respond to contextual requests by their superiors and clients who still prefer the manual visualization of ideas. “The first sketch, the first imprecise model, what is sometimes called a “gesture of the designer.” It is an arbitrary object invading the blank sheet, bestowing new and equivocal meanings to the next stage of the design. (Corona-Martínez & Quantrill, 2003, p. 178)”

However, while most of the design firms rely completely on software to design, conceptualize and visualize their projects, many traditional architects still prefer the hand tools to achieve the same goals. The debate is controversial, and many researchers adopted it as their topic; the main argument is whether to teach students directly on computer or rather teach them the basic hand design work and give them the opportunity to choose their own way of expression. In the design classes, most students preferred working on computers and design software rather than using hand sketching or physical design tools.



Figure IV.13. Different types of 3D modeling techniques in design studio 03 –
Okan University

(5) Printing and Documentation

Teachers pay a close attention to assignments documentation as a critical request for student to take into consideration. Plans, elevations, sections and concept studies are always to be printed and submitted accordingly. As an experienced architect, the researcher gives this request a great value especially when it comes to drawing of sketch or printed works.

As architects to be, students must be held responsible for what they print, submit and supersede (Corona-Martínez & Quantrill, 2003, p. 57). Moreover, practicing documentation will help improve their ability to learn from themselves which in return will reflect in their internship in design studios. A good way to impress your boss at work is to always take notes and retrieve previous information when asked to. Students do pay attention to this request. However, a few students still argue that the digital image has taken over the printed one. While this argument is valid, the market deals with the digital image as to-be-printed medium. Unfortunately, students yet need to learn that the market demands, and client requirements do not always pay attention to the digital-printed argument.



Figure IV.14. Manual drawing of plan and 3D virtual model in Design Studio 03 - Architecture Department – Okan University



Figure IV.15. Printed plans and 3D images in Design Studio 03 – Architecture Department – Okan University



Figure IV.16. Digital Images_ no printout_ Design Studio 03 Architecture Department – Okan University

(6) Design Project Schedule and Tasks Required by Students

The classes' schedules were given in details to students. Not only this will help students learn design process and time control, but also it will enforce the sense of responsibility and accountability. In Architectural design studios time is as valuable as any other factor, "forming general ideas into specific requirements is the Predesign process of programming - perhaps the most important set of decisions the architect will make (Box, 2007, p. 59)". In this sense, the researcher believes that teachers are giving the ultimate enforcement to students to learn how to adapt to critical submissions and how to work under time-pressure; which is most of the design studios in the market adhere and how projects and submissions are tailored.

While this is understood to be an important method in teaching design classes, most of the students on the other hand are not paying attention to its importance. The researcher argues that the students' absence of commitment to schedule is due to their lack of understanding of design stages and time as a major factor in active design studios; an issue to be addressed in all other classes if the same pattern prevails.

4.2.2. Student Design Skills

(1) Student Design Process Understanding

In architecture, "How do we make comparable the work of different students in order to evaluate them? This is a consequence of the freedom of design accorded to each student in the studio to solve a problem in his or her own way. People who have different prejudices about the problem will produce designs with different emphasis. In

theory at least, the relative success of each student's proposal will be measured by its adequacy to address the requirements set out in the brief. It will also be measured by the quality of the representations the student shows to communicate the design; those deemed adequate to represent buildings change very much in time, giving rise to "styles" well beyond the simple technical representation of objects." (Corona-Martínez & Quantrill, 2003, p. 47)

(2) Case Studies Research

Architectural firms expect graduates to employ their fresh blood in their designs and to implement their trendy understanding of the market in the details and the rationale behind their approach, let alone the essential forms of basic technicalities such as building entrances, ramp orientation, light directions and façade treatments. It is the architect's responsibility is to widen their visual experience, perspective and acceptance of contrast (Fisher, 2000, p. 67), here comes the importance of case study research.

Teachers in classes were generously responsible for providing students with different case studies, design scenarios, architectural terminology, references and design trends with each given assignment to study and look for. Although, case studies help building the visual experience which is one skill students should possess and practice, understanding selected case studies design process and programs critical because it works mainly in two direction. The first one is to teach student about "Design Research". Design Research in the field of architecture and architectural experimentation, covers a large field of activities from artistic design to strictly controlled experimentation of new forms of building (Niklaus Kohler, 2000, p. 272).

Collecting and analyzing data is a way to support the researched project or to verify a research findings (Cowdroy, 2000, p. 30) .

The second direction is to build acquired skills and knowledge students need to be successful architects “Design Culture”; The Importance of Design Culture “It provides a sense of identity, both individual and communal, something in which to believe.” (Fisher, 2000, p. 69). This way design culture not only effect the designing process, it can affect architects to be behavior, their view of the world, even personal choses and preference (Fisher, 2000, p. 67).

While teachers paid a great attention to this point, empowering students with a reward-based system to learn about the market trends, basic treatments, human experience and users scenarios, as “Sometimes knowledge is expected to be manifest in the design in the same way that other cultural content appears in the work of an artist, who is considered an interpreter of culture. (Corona-Martínez & Quantrill, 2003, p. 47) it was hardly noticed in the final submissions how oriented the students were. The researcher urges that this has to do with Students weak transferability of cumulated data from phase to phase and no knowing how to use it (Fry, Ketteridge, & Marshall, 2003, p. 22).

(3) Problem Solving

Architecture designers are both problem-starter and problem-solver (Adams, 1986, p. 23), with each design assignment architect students finds out about a “real” design problem and undertakes a design process; this will produce the description of the building that would “solve the problem.” (Corona-Martínez & Quantrill, 2003, p.

43) The issue in design class here that students became “problem starter” and depend on the teacher to be “problem solver”, in design studio classes, the students have “their teachers who helps, as if the student were intended to face the prospective client. In fact, the teacher is in a way the client- who would be confronted with representations of objects quite far from what they imagined. The design responds to the dialog between the student, who is learning architecture, and the teacher, who knows a lot about the subject.” (Corona-Martínez & Quantrill, 2003, p. 43) This common problems in design studios is linked to how much care a student would provide defining problems for each of the design stages, poor visual problem solving, and details before Mass.

(4) Defining the Problem

The Difficulty in isolating the problem is often due to the tendency to spend a minimum of effort on problem-definition in order to get to the important matter of solving it.” (Adams, 1986, p. 23) The weak implementation of accumulated information leads to critical imbalance in project submission. In early stages of the design, as architects begin to outline the project design, problems come out.

If the problems were not taken care of simultaneously and consistently, other problems will build over and hide early problems. As a result, more difficult and complicated problems will come out later. This overlap of problems becomes a burden as these problems will be difficult for students to solve and teachers will have to waste their time and other students’ time solving unplanned issues. Design classes follow university rules and time schedules and must not be wasted over unwanted personal misconception of problems.

(5) Visual Problem Solving

Strong visual problem solving is a must skill to learn, “With site, program, and budget in mind, you can begin to place each part of the project in a hierarchy and give it preference in size, orientation preferences, location, and functional proximity. Soon architect will begin to see possibilities for actual physical form and develop a progression of spaces. From the sketch diagram in plan form, visualize moving through the spaces; find axes that can help you organize spaces (Box, 2007, p. 82). In design studio, because students uses 3D modeling programs from the early stages of the design process to visualize mass and material (Corona-Martínez & Quantrill, 2003, p. 172), they become more cornered about the image they creates, Leads to a trend to disregard exact functional fitness - forcing spaces in the selection of shapes become (Corona-Martínez & Quantrill, 2003, p. 177) .

(6) Detail before Mass

“Every design assignment is done starting with a problem conceived as a whole: from this intuition of the whole, the project has to be created. Very seldom will we find parts of a building as a design subject. That would not be adequate, as the new project is considered proof of the student’s creativity. His or her artistic personality is reflected in it. Self-realization as an artist is a strong component in the student’s selection of this career.” (Corona-Martínez & Quantrill, 2003, p. 43). “Beginning from the whole product—the complete design of a building—means that the student is expected to produce a model of a building that would satisfy a real program in the real world. (Corona-Martínez & Quantrill, 2003, p. 43)” A common mistake in architectural design

classes is to mind the details and material selection before deciding on the mass and the main layout. Design character and language are subject to change as per client request and budget and must not be the total reference of a building.

In architectural firms, architects follow a certain step with the help of others. Most of the time they start with researching and site analysis followed by brainstorming, preliminary sketches and concept outlining. Later when they decide on a few design options, they start to mass the project in reference to the storyboard and concept outlining. After a few masses comes the light and wind studies, traffic and movement chart and many human studies. Later when they solve all the functionality studies, detailing starts to take place. It's a built-up procedure that can be flexible but not backward. In design classes, many students jumped into material selection and coloring as to characterize their design. Other students started to detail windows and staircases. While it's a very important stage of the design, an architect must follow basics of building hierarchy and think from top to bottom and from the big to the small.

As architect to be, student should be able to solve a complex problem with clarity, making something happen that's better than what it thought to be. (Box, 2007, pp. 96-70) If students learn how to solve their design problems from the beginning, they will graduate with a built-in solution-based design skill (decision making). Time is money at the end and architectural firms pay close attention to intern architects when they fail to perform accordingly. Project challenges can "best be handled with visual problem solving, in which diagrams of program requirements are made and solutions are tried. As architect work with the diagrams you can see relationships emerge and patterns form

into a composite that can be made into a building.” (Box, 2007, p. 83) “It’s the designer visualization of what the building seeks to be. It can be a sketch of the floor plan idea, or a small sketch model, or a sketch of the building sitting on the site, or any other means of describing the building in their mind—even a written description of the concept.” (Box, 2007, p. 84)



Figure IV.17. Problem Solving _Design Studio 03 - Architecture Department – Okan University

(7) Creating a Concept

The term architecture normally refers to objects, buildings; and/or to processes in which the buildings are designed, built, renovated and operated. This dual meaning reflects the complex nature of what architects do and what they produce. (Niklaus Kohler, 2000, p. 270) However debatable, problem solving is a key requirement for architects, the trick is “the originality of the design, because the design really will be evaluated by its similitude to other designs serving similar functions.” (Corona-Martínez & Quantrill, 2003, p. 47) “Architect Designers are always looking for ways to help determine the form of their work, be it a function, a style, a theory, a structure, a precedent, a geometry, a sustainability issue, a moral imperative, that helps create

form. Architect seek to validate their newly created forms visually, intellectually, and emotionally to be stamped [special] (Box, 2007, p. 123). In the same time, “have to take into account their client's desires and the planning and technical problems within the finite resources available.” (Wasserman, Sullivan, & Palermo, 2000, p. 3).

“Many professions are in a way or another connected to design. Some of them are pure technical while others are pure science. In between, some professions, like architecture, are more connected to feelings, Art, design, market, personal preferences and demand. However, “Thinking like an architect differs from thinking like most other professionals because the architect is a generalist seeking to produce an art that is in service of people's needs. Its range of activity is broad.” (Box, 2007, p. 81) “Design of architecture is complex because there are always so many competing variables—and, tougher still; they all seek to be reconciled simultaneously and artfully. Each individual designer makes decisions with each variable have a value judgment placed on it.” (Box, 2007, p. 83)

Intern architects would rather pay attention to both approaches as interconnected solutions. Problem solving is as important as the concept behind the problem and the very given solution. In design classes, architects learn how to develop a concept while solving many sorts of problems. While functionality is an ongoing problem that requires ongoing solutions, concept development is as problematic as any other function as it is a selling point among function.

In the design classes attended, frame of functionalism became both as a statement of principles and as a call to action. (Corona-Martínez & Quantrill, 2003, p. 48) And

was taken care of over other concept finding factors- manifestation of this conclusion can be seen in students design works on sketch design exam.

“Thinking beyond the functional needs of the building and beyond the current manner of architectural expression involves serious questions. Bright minds continue to search for answers at drawing boards and computers and in articles, books, seminars, and public forums, far beyond bricks and mortar.” (Box, 2007, pp. 49-50) The researcher believes that students carry the burden of working as a whole team where they should occupy research, architecture, interior, graphic design, draftsman and administration.

(8) Understanding the Concept

Another problem was noticed by researcher is the absence of “concept diagrams”. In every project submission, delivery package must be complete according to the stage of design. In conceptual submissions, the package components vary according to the given requirement. However, there are minimum requirements that architects should always submit inline without being asked to. Concept diagrams is one major component that should not be missed. It tells everything the client (teacher) should learn about the project. Architects should not rely on the verbal description of the concept development, instead they must refer to every stage of the design with a diagram study representing their way of thinking, let alone the technical diagrams featuring the project sketches, plans, elevations, sections and environmental studies.

As a teacher, the researcher emphasizes on the concept development diagrams as the visual description of the project. In design classes 1 & 2, architects would rather

focus on the conceptual and theoretical part of the project. In design classes 3 & 4, although students must focus on the practical part of the submission and but concept creating is essential to learn how to sell their idea in a complete package.

(9) Decision Making

Many projects that offer great ideas and concepts fail to sell. Unlike Art, to design is to solve problems and Architects should be held responsible for their solutions and decision making. The importance of clear, stronger concepts, they explain: Each physical action or operation that we make to solve a problem can be seen in terms of a more general conceptual approach, useful in solving any problem. It is the rationale or purpose behind your actions: the "why" as opposed to the "what." This general, conceptual approach call a "strategy." Clear strategy should help in design decision making to solve all kinds of problems. (Adams, 1986, pp. 73-74)

Designing is a continuous decision making, and “trying to decide what ought to be done, the right thing to do, to determine the best “good” solution, are value-driven quests, ethical quests. Many of the activities that the architect engages in require judgment, respect, and trust among the community of people participating in and affected by a building project.” (Wasserman, Sullivan, & Palermo, 2000, p. 5) If architects cannot rationalize their design, it becomes difficult to convince the audience and will result in a complete submission failure (Fisher, 2000, p. 68). The first step to solve a problem is by making design strategy simply to put and easy to understand. Whether the submission is written, visualized or verbally presented, it should be given with the simplest forms of terminology and language. In design classes, decision

making is a practice-based curriculum in which students learn how to express their approach to different mentalities and backgrounds as a marketing tool. Learning how to achieve this skill will help them pass multiple practice requirements in design firms.

Of the many class submissions, few of them offered solid description and explanation of how and why a decision was made. Vaguely put, many students who have wonderful visual and physical concepts failed to demonstrate design rationale and thus far failed to convince their teachers (Adams, 1986, p. 23)”. And many of those who could convince their teachers, would hardly pass convincing clients as the latter is less acknowledged with the design terminology and the logic behind decision making.

Table IV.7. Summary of Observation Data Analysis

| 1 | Design Studio Learning Environment | 2 | Student Design Skills |
|---|--|---|------------------------------|
| | Teaching Style and Communication | ■ | Design Process Understanding |
| ■ | Feedback and Discussions | ■ | Creative Problem Solving |
| ■ | Student Verbal Skills presenting Ideas | | Defining Project Problem |
| ■ | Students Written Skills for Presenting Ideas | ■ | Creating Concepts Process |
| | Design Project Schedule and Tasks | ■ | Design Decision Making |
| ■ | Useful use of Data Collection and Analysis | | |

■ Existing Shortcomings and challenges Noticed by the Researcher in Design Studio Sample (need to be addressed in this research)

4.2.3. Questionnaire Analysis and Finding

The purpose of this questionnaire is to find another source of data collection to confirm the researcher observations notes scientifically. The researcher uses quantitative method. This questionnaire (1) is divided into two section as previously, all of which will cover the below diagram six concerns.

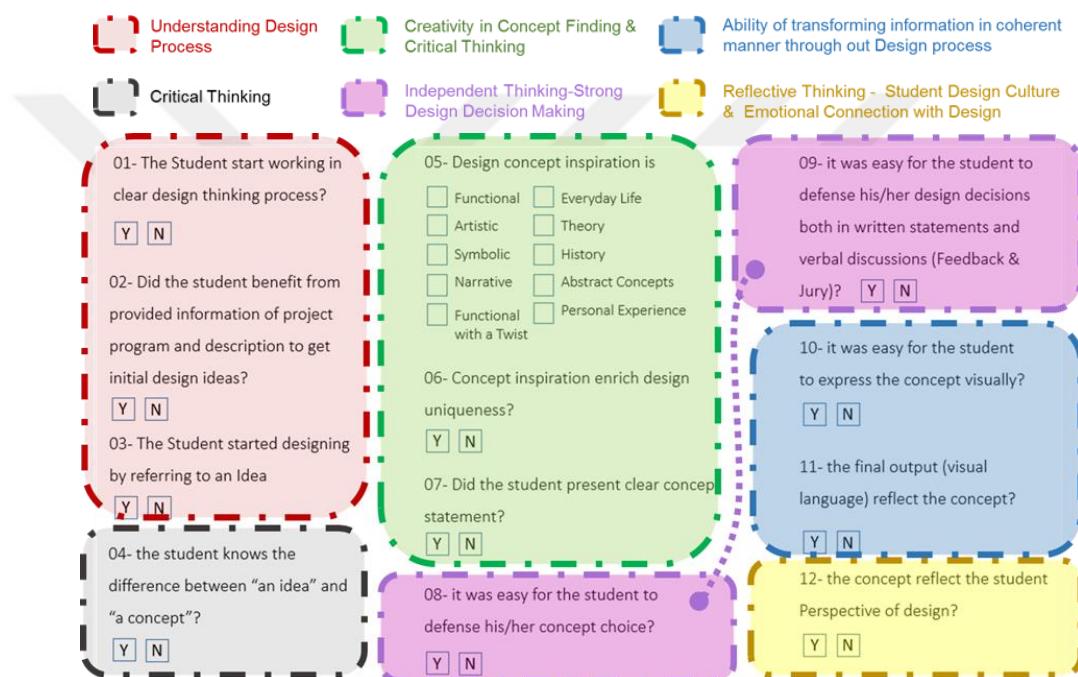


Figure IV.18. Questionnaire 01 Diagram Analysis

Questions number 01,02,03 are for understanding of design process. question number 04 for critical thinking. Questions number 05,06,07 are for creativity in concept finding & critical thinking. Questions numbers 08,09 are for independent thinking-strong design decision making. Questions number 10,11 are for ability of transforming information in coherent manner throughout design process. Question number 12 is for student design culture & emotional connection with design.

Table IV.8. Questionnaire 01: Design Exam Evaluation Findings

| No# | Question | Why I chose this question? | Answers (41 Students) | | What does the Finding indicate? |
|-----|---|---|-----------------------|--------|--|
| | | | YES | 100% | |
| 1 | Student starts working in clear design thinking process? | Hierarchy in design thinking helps build a solid understanding. | 17 | 41.5 % | Teacher will have to focus more on how to enforce students to refer to an idea while starting the design and moving forward from this point |
| 2 | Did the student benefit from provided information of project program and description to get initial design ideas? | To measure the student understanding of project provided data and benefit from it in their design. | 14 | 34% | Teacher will have to emphasize on the importance of given data in design process and the layout formation of the project |
| 3 | The Student started designing by referring to an Idea | Hierarchy in design thinking helps build a solid understanding | 27 | 65.8 % | Teacher will build on this right-thinking hierarchy and enhance it in a more coherent way |
| 4 | Student knows the difference between “an idea” and “a concept” | Differentiating between an Idea and a Concept is a major step into the implementation of design thinking. | 9 | 22% | Teacher will need to revive students’ knowledge about the difference between the idea and the concept and build better understanding of the usage of each in design process. |
| 5 | Design concept inspiration is? | To evaluate how student finds the concept after the idea was developed | 9 | 22% | Teacher will pay extra attention to teaching students how to find suitable concepts for their designs in a broader approach. |
| 6 | Concept inspiration enrich design uniqueness | To measure how students, develop their concept based on given inspirations and enrichen it further | 5 | 12% | Teacher will create a link between students and surrounding inspiration to help them use all the possible data available. |

| | | | | | |
|----|---|---|---|-----|---|
| 7 | Did the student present clear concept statement? | To tell whether students truly understand what they offer rather than scattered ideas that don't help create an understanding of the concept itself | 9 | 22% | Teacher will coherently help students become more self-critical in their thinking and help them become more direct. |
| 8 | It was easy for the student to defend his/her concept choice | To tell how confident and clear the students are in defending their ideas. | 7 | 17% | Teacher will help build a self-confidence and strong decision making among students through all the project design process |
| 9 | Student ability to defend his/her design decisions both in written statements and verbal discussions (Feedback & Jury)? | To measure the self-independency of the students when they present their ideas professionally | 5 | 12% | Teacher will thoroughly introduce professional practice methods to students to help them prepare for the market |
| 10 | It was easy for the student to express the concept visually | To measure student's presentation skills and information - transformation through stages of design | 7 | 17% | Teacher will work one-to-one with each student to help them build a strategy on how to always present and transform their ideas visually |
| 11 | the final output (visual language) reflect the concept | To measure student's success on moving from a stage to a stage in design process with the minimum obstacles. | 7 | 17% | Teacher will critically help students learn how to reflect their concept into a fresh winning product |
| 12 | the concept reflects the student Perspective of design | To measure student's engagement of oneself into their designs on a personal level | 5 | 12% | Teacher will help students on how to uniquely project their personality on their designs which will help personalize their designs to leave a fingerprint |

4.3. Experiment Phase Two: Applying Storytelling

Following is the researcher's own narrative description of this experiment. This will include observations regarding what happened (facts, events, interactions, etc.) and the researcher's conclusions regarding what modification should be considered in order to maintain the viability of this experiment. She will cover in detail the first eight weeks of the semester, because these weeks are the basis upon which the rest of the work was built.

In this phase the researcher applied storytelling as learning and design tool. The goal is to create a storytelling culture in design studio environment. As storytelling in this research is a strategy of reflection and experience learning. The researcher divided the application of storytelling model into two part, one for learning purposes and the other to be used in design process.

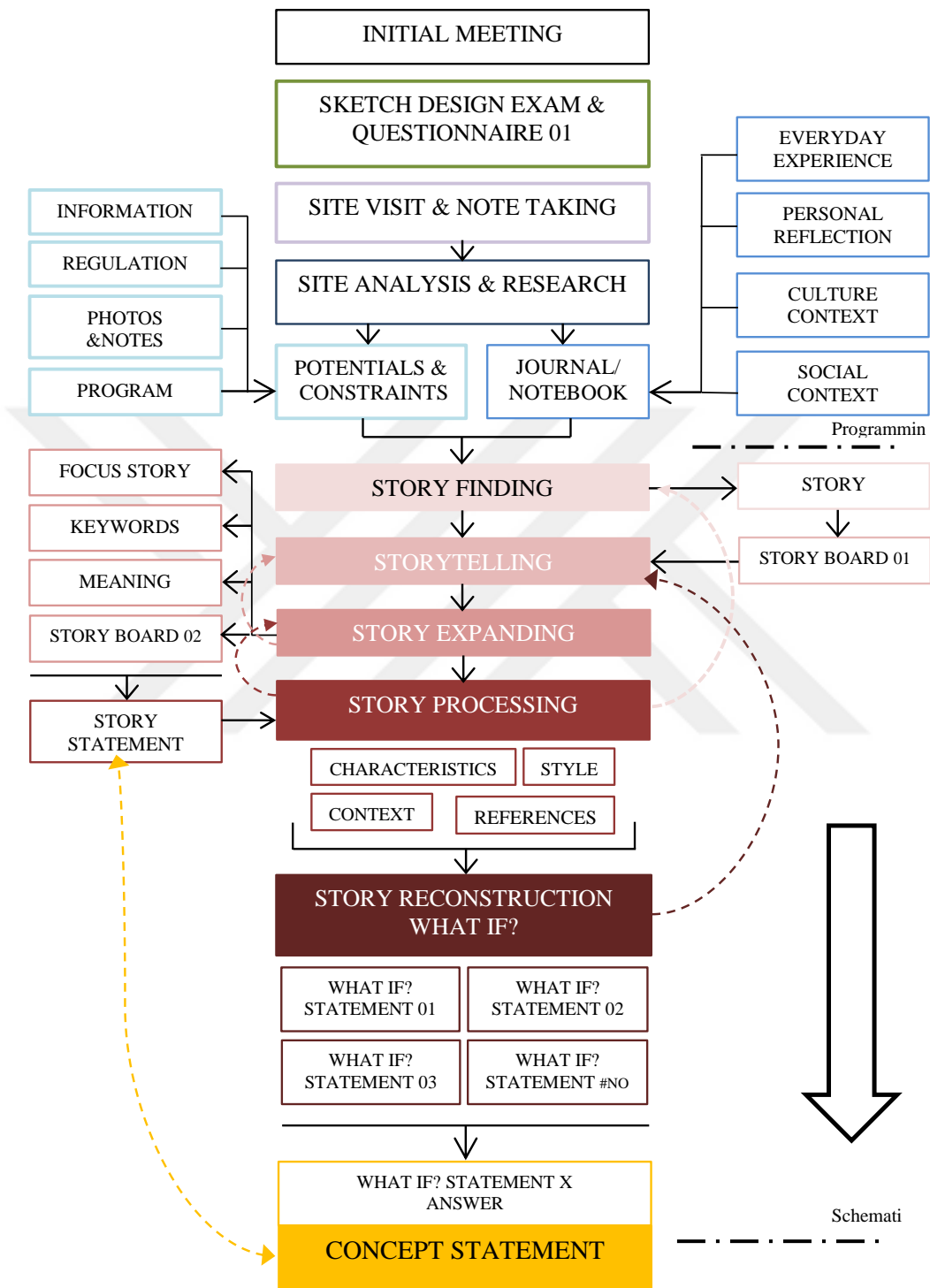


Figure IV.19. Storytelling Application Methodology in Design Studio (04) Diagram

4.3.1. Week 01: Meeting Everyone

Upon my meeting the students for the first time, I was interested in knowing about their personal backgrounds and their academic achievements. I therefore asked each student to introduce himself or herself to me and to their fellows, and to tell us something about their culture, family and friends, and any relevant details they could think of to present themselves. This was my first indirect effort to introduce storytelling into the class. By doing so, I gained a general sense of the students' individual personalities and of each one's verbal presentation skills. At the same time, I sensed some anxiousness from some of them when I introduced myself as their teacher. The tension resulted mostly from the fact that I would be conducting the course in English. To ease this initial strain between us, I began repeating some funny Turkish words that I know, and I tried to explain myself in Turkish sentences; my students thus had the fun of correcting me. I then told them that I would work to improve their English if they would help me to improve my Turkish. I ended class by asking students to bring copies of their previous design works to our next class. I did this so that I would be able to assess the students' current design skills and also so that I could gain some idea of the types of projects on which they had previously worked, and how they might have responded to demands made of them.

Meeting my teaching colleague for this class proved to be a surprise for both of us. I thought that I would be teaching this class by myself, and she, in turn, didn't know that I would be attending her class. My colleague was informed only minutes before the start of the first session that she would have to share her design class with me. This

confusion made us both uncomfortable during the first part of the lesson. I had to explain to her in some detail what I was studying and how participation in her class was contributing to my PhD research, and it was necessary to describe for her the specific research plans for this class, etc. Although my colleague wasn't particularly excited to share her class with anyone else, she became interested in knowing more about my experiment of using storytelling in design classes, and she offered to help. I suggested that we work together in re-programming some design activities and that we discuss the course schedule later. As I mentioned before, her positive role in the experiment contributed significantly to the experiment's results.

4.3.2. Week 02: Heated Discussions and Evaluation of Skills

The second week was important for setting some of the experiment's criteria and for modifying others. The first important considerations involved the nature of the project and its timeline. My colleague and I began to explain to the students the nature of the project and what adjustments needed to be made to suit this experiment, although without explaining why. The first adjustment to be made was to unify the project building type and use for all students. The second adjustment was to replace the Princes' Islands location with the Karakoy neighborhood. The third adjustment was related to the learning environment in the design studio. These changes faced pushback by some students, because, as the students informed me, they had always enjoyed the freedom to choose their own project type and function, no questions asked -- and by our unifying the project function, wouldn't they end up all designing the same building? Of course,

this was not their true objection. As I discussed their concerns further with them, it became clear to me that they simply did not want to change the process that they had become used to, which is a perfectly normal human reaction in the face of sudden and significant change. So, after heated arguments on their part about why we should keep everything the same, I gave them a copy of the project brief that I had already designed and the course schedule that my colleague and I had agreed on.

Referring to the course schedule, I noted that the next week there would be site visits. We decided that the students should be divided into three groups; each student was free to choose his/her teammates. One group was assigned to each location: Group 01, Galata Area; Group 02, Karakoy; and Group 03, Kuzguncuk area0). I then conducted a lecture to explain the process of site visits and site analysis for architectural projects. We provided different examples of site analysis studies (printouts, digital copies) from an architectural company for students to use as references. At the end of the lecture, I gave the students a quick in-class exercise related to how site characteristics can affect design solutions and decisions (open-discussion format). Before ending the class session, I shared some stories from my own professional experience, related to site visits and the data collection phase, emphasizing the importance of this as a stage of the design process.

The lesson that followed this lecture was sketch design exam day. I had forewarned my students of this exam and told them to prepare themselves with presentation tools and materials to use on the exam. My evaluation of the students' design submissions made it clear to me that they tried to solve it only functionally. I

found no presentation of design concept (written or simple sketches) in most of the submissions. I kept moving around, taking notes and pictures of their design outcomes. After a while, I began a quick, private conversation with each student to ask: “Why you are designing in this way?” Five out of ten responded: “I don’t know.” Three of the ten answered: “I like this shape; I used it before.” And only two had a design concept along with their general-project designs.

After students submitted their designs, I asked them to fill out Questionnaire 1; in this way, I was able to record their reflections on this experience. Then, their classroom instructor and I filled out the same questionnaire, in order to evaluate each design submission.

4.3.3. Week 03: Journey Begins: Site Visits and Creating New Memories

It was a rainy day as I waited for my students to meet me at a café that looks directly on Galata Tower. I would be meeting Groups 01 and 02; my colleague would be with Group 03. As the students began arriving, I invited them to join me for coffee before starting the site visit. We began talking about different things like the weather and whether they were excited to see the area. For some of them, this was an interesting adventure, as they were visiting the area for the first time; others were quite familiar with the neighborhood and started telling us about their favorite nearby places. I had a Google map of the Galata and Karakoy neighborhoods, and so we started to plan our investigative route, starting from Galata Tower and ending with the Karakoy Bridge. As we began walking down the road, I asked the students to do two things: Take as

many photos as you can and write or record observational notes. They asked me what they needed to write down, and I responded: “Whatever catches your eyes and looks interesting from your own point of view”.

While the students were taking photos and notes related to their site visit experience, I was observing them and what triggers their attention. I wanted to know more about their personal preferences and their documenting skills, as these are important considerations during the next phase of the design process. I encouraged them to chat with the locals, and to get to know something about the neighborhood from them. Such casual conversations with local residents allow the students to connect with the area at a deeper level, and to collect data in informal ways. As for the third group, I had already asked my colleague to ask these students to do the same site-visiting activities. At the end of the day, each group concentrated on a specific part of the neighborhood for detailed analysis and data collection.

The next class meeting after the site visit day was supposed to be the first site analysis and data collection presentation. We expected to see full site analysis drawings and research data related to the project, but, in the event, we were disappointed. So, in order to lose no more time, we asked the students to start working in class on preparation of their analysis drawings and collected data. Before the students began this work, however, I asked them to hang on the walls whatever documentation they had brought with them that was related to the site-visit day. We then conducted a one-on-one discussion with each student, just asking each one to tell us everything about that day (verbally), from the moment they left their house, through arriving at the site, and

then ending with their leaving the site. As each one started telling us her/his story, I began to probe with deeper questions, such as: “Why you are choosing this information?” “What new thing did you learn there?” “Can you describe your feeling in this particular moment?” etc. Of course, they didn’t answer some of these questions directly, as they were wondering why I was asking such things.

My colleague and I agreed that the students would need to spend more time on this stage, in order to learn the correct ways to study and analyze these data, and to then present the information in proper drawings and media. In the second half of the design class, I presented a lecture explaining what function the site analysis and research phase performs in the design process, and why a designer should really care to understand the data that we are collecting and studying. Then, I began to describe for them a time when this phase had entirely shaped all design process outcomes in the later stages of a heritage renovation project that I had worked on for one of Amman’s old neighborhoods, when I had been a member of a design team assigned to the project. As my description continued, I showed them class digital examples of the project documentation and analysis drawings.

At the end of the lesson, I asked them to prepare their drawings for the next class, and told them that the class would present them with their first jury day-group work, and would include:

- Formal information on the site, such as site infrastructure, zoning, history, social context, and surroundings; taking photos; solid and void views; etc.

- Full-Site analysis drawings to reflect the data they collected, such as environmental elements, site infrastructure, solid and void, vegetation, visual analysis, elements of the city, and site topography section. All these drawings should be color-coded and annotated
- Site Photos

This stage was still group work, but I told them that from the subsequent class onward, each student would be working alone. And at this point we modified the project design schedule in order to push the site-analysis findings presentation to the next class.

4.3.4. Week 04: Story Finding: More Analysis, Research and Digging

This week involved the students' first jury presentation as groups. It was interesting to see how much work they delivered. They told me they enjoyed coloring the drawings and learning about site analysis graphics and layout. That real question was: Did they understand what they had analyzed? This is what I needed to know.

Each group posted its drawings and pictures on one side of the classroom. I asked them to divide themselves according to their presentation order. I wanted each student to participate in this jury. Now, as I said before, the classroom would serve as our office, so I instructed the students to consider us, the tutors, as clients, and to assume that we knew nothing about these areas or about they themselves. We were meeting for the first time. The goal was to push them outside their comfort zone and to improve their presentation skills (body language and verbal skills). Each student was to introduce him/herself for us, tell us about his/her experience on site-visit day, and to then proceed

with the details of the relevant information to be presented; they were starting to learn how to be storytellers.

As mentioned before, some of the students had difficulty expressing themselves in English, so I wanted to use storytelling as a practice tool for these students to improve their language skills, both spoken and written, as they used English as a communication tool to connect to their juror and tutors ;And because each presenter was, at some level, emotionally involved in his or her own reflections, each was interested in learning how best to express these emotions and ideas in correctly constructed sentences and was also interested in learning related vocabulary words.

To make sure that they benefited from these exercises, I asked them to prepare:

- Analysis drawing of site Potentials & Constraints facts
- Case study analysis: Three case studies of projects (domestic and international) of the same building function to study their designs, programs, zoning, and a bubble diagram
- Project bubble diagram
- And, finally, a written paragraph about their day on-site and what they experienced there; as they had done in class, they should write the paragraph in their notebook

The last request is a written homework assignment: Journals writing. After site note writing, data collection, and site analysis, students were asked to write their memories from the site visit in story form, in their own way, and from their own point

of view. They were asked to describe generally their adventures and observations from the site visit: How was the day? Whom did they meet? What did they find interesting? Had they known about this location before or had they previously visited it? Did this experience add something new for them? This step is a repetition of the verbal story they had shared before, although it is a more-detailed version of the verbal story.

The following class, the discussions were one-on-one. Each student presented the drawings that were asked of them, the three-case-studies examples, and their notebook. I was interested to see their site Potentials & Constraints drawings and the story they wrote in their notebooks, and how they picked the case studies examples.

For the first part, I asked them to elaborate more about site Potentials & Constraints drawings, and about how they decided which facts to focus on and which to ignore, and I then asked for their reflections on how this experience could affect their design solutions in the future. It was nice to see that there was some improvement and a better sense of combining information from different sources to create a coherent approach. As for the case studies, they had to explain to me what criteria related to their analysis, helping them as they selected these case studies.

Finally, as I listened to them reading their stories from their notebooks, some of these stories were interesting and some others read as if they were mundane daily reports of tasks. I gathered those students who had failed to write the story as asked, around my table, and started to tell them about a site visit that I had experienced during my school days. Then, I asked them what they noticed about my way of telling the story, and if they could imagine that day, and if there were a certain part of my story

that they want to know more about. As they started answering my question, I began comparing my story structure to theirs, and the level of personal emotions that had been reflected in my story. Each student figured out what was missing from his/her journal and was assigned a re-write of the story for the next class.

For the next class, beside continuing to work their analysis and documentation of data, I asked all students (even those whose stories had been successful as prose narratives, and who had not been part of the above-described “re-write group”) to re-tell -- for the third time -- their stories, but now in a storyboard form. The students were to create a graphic organizer, in the form of illustrations or images of their site visit, displayed in sequence. The purpose was to visualize the sequence that formed their stories. Each student was also to give their story a title. I informed them that these stories would be discussed in a group session.

4.3.5. Week 05: Becoming Storytellers and Expanding Story Horizons

This week marked the first time that students presented their work to be evaluated by the jury on an individual basis. Each student presented the following documents: (1) Summary of site analysis and data collection drawing; (2) Site Potentials & Constraints; (3) Case study analysis; (4) Project bubble diagram; and (5) Story and Storyboard. My colleague and I in this jury focused on: (1) The quality of student understanding and connections between different project data; (2) Improvements in presentation skills (oral and visual); (3) Storytelling skills; (4) Originality of narrative; (5) Storyboard; and, finally, (6) Overall assessment of improvement.

At this stage, each student had been indirectly practicing storytelling skills and had been reflecting different levels of understanding of their learning experience by being part of multiple activities related to the first stage of the design process. Their stories were reflected in three media: (1) verbal; (2) written; and (3) visual (storyboard). By using this variety of media, their stories evolved to reflect a deepened understanding and emotional maturity between the student and the experience.

My colleague and I noticed that some of our students who had generally been shy in previous group discussions became increasingly confident in expressing their thoughts, and we likewise noted an improved ability to connect with us as jurors. Another interesting fact we noticed as we evaluated their stories was that the majority of these stories reflected the personality of the student on a human level. This observation is a valuable factor to consider for the next stage of the storytelling process, which is story expanding.

To prepare for this next stage, after we had completed the jury evaluation, I asked my students to develop their stories by focusing primarily on the reason or the emotion that they believe their story is about, that makes this story especially meaningful for them, and I asked them to explain why it was important to them to express this. As a corollary to this re-focus, I asked each student to re-write his/her original story and to re-draw the storyboard in a more focused manner: to re-work the story's prose using direct, shorter sentences and simpler words that build clearer story structure. Then, I asked each student to give his or her story a new title that we will call a "Story Statement."

The subsequent class was dedicated to the stage of expanding the story. Students brought the re-focused versions of their stories and storyboards, after writing their focused story in shorter sentences and clearer words and giving their story the title that we called a Story Statement. Words such as *love, nostalgia, grid, void and mass, outside, inside, visible, hidden, childhood, rigid, flow, music, techno, gathering, religion, and freedom* were used by students in their stories. Any student who had failed to find inspirational keywords was required to go back to the storytelling stage and to freshen things up.

In the story-expanding stage, story keywords may take on somewhat different and deeper meanings than these same words would convey in an ordinary, straightforwardly descriptive context. Students started to explore the meaning of these keywords, and to experiment with ways to express the varieties and depths of the words' meaning in a visual way. To help them do so, I asked them to find inspirations related to these words – inspiration that could be drawn from any source, so long as the student felt that it was related to his/her words and would create project design references, characteristics, context, and style: patterns, literature, music, symbols, narratives, everyday life, history, and so on. Abstract concepts from built-up experience are among many sources of inspiration.

4.3.6. Week 06: What Comes Next is Going to be Tough

We had, during the sixth week, reached the toughest two stages of this experiment: story processing and story reconstructing. The difficulty inherent in these stages is that

all the information the student had gained during previous stages, and all of the data the student had collected, should start to connect to each other. In other words, it is an exploration phase of ideas. Based on instructions from previous lectures, each student was to introduce us, the tutors, to a matrix that connected words and their meanings with the sources of their inspirations. When these inspirational sources are identified by the student as the cornerstone of design, they become project design references, characteristics, context, and style.

In the beginning of this lesson, I began by explaining to my students' what design references, project characteristics, context, and style mean. Design reference is a final source[s] chosen by the designer in order to ascertain his/her design criteria and design decisions. Project characteristics refers to how the design should look (big, small, clustered, free, etc.). Context and style here mean the environment or set of rules that will control the physical and visual outcome of the project (old, new, wild, etc.) (urban, gothic, minimalist, etc.).

I then had to clarify an important point: Although design context and style can be reflected literally or figuratively in project designs, we can't do the same with design references. Students must not literally follow the references they collected; instead, they must follow their own critical thinking when they represent an idea in their design. To elaborate on this point, I showed them example of projects that share the same inspirational references, but for which the outcomes vary in representation according to each designer's critical thinking and according to the references used. So, for the next class, I asked the students to print out examples of references, project

characteristics, context, and style that would help in transforming their story keywords from just words and feelings on paper into a 2D or 3D physical object.

For the following design studio class, each student brought printed materials for the design references, project characteristics, context, and style they thought related to their story. During one-on-one discussions with each student, my colleague and I evaluated these materials. We were considering the following points: (1) Uniqueness of the material; (2) Flexibility regarding change; (3) Is it useful? (4) Strong correlation with the story; and (5) Could it be altered and interpreted by the student? Some of the students encountered some trouble in finding the right materials, and others brought overused materials. So, these students had to complete the assignment again and again. Materials discussion and evaluation was conducted during one-to-one sessions.

4.3.7. Week 07: What if? Explain, Please!

After approving the materials of design references, project characteristics, context, and style, students were asked to reconstruct the relationships between them, and how they were integrated together into one whole design (visually, functionally, and in terms of content). To phrase it another way: the idea is to create abstract ideas or the design concept from the reconstruction of the relationships described above. To create a concept, the students were to start story reconstruction through conducting reflective dialogue, from multiple perspectives of design references, project characteristics, context, and style, to explore and use that to build design visual language. This process starts when the student asks: “What if?”

To help the student to convey words visually, I told my students to write down multiple *What if* statements. In this way, these question statements invite the imagination into *How* the story references, and characters and worlds will be interrogated to become a creative solution of the project. By answering this question, the student will create *The Concept Statement*. In the class, I instructed my students to write down at least four *What if* statements and I instructed them on *How* to do so. Then students were directed to answer all these questions, and to provide their reasoning for each answer. This exercise involves researching and learning from previous similar design solutions, although the goal is to then produce a design that is different from what has been done before.

We sensed confusion among the students regarding the difference between an idea and a concept in the designing process. Thus, I had to elaborate regarding what a design concept is and regarding the role it plays in the design process and in decision-making. I started a game in the class that involves the students suggesting a concept for an idea that I share with them, and then discussing why this concept is acceptable or not, good or bad. The roles are then reversed: The students will suggest an idea and the goal is to find a matching concept. Some of their answers were funny and refreshing, because they were little naïve. This game broke the ice and eased the atmosphere after two tough classes.

For the next class, I asked the students to prepare three *What if* statements for their project, the answers to be written as one-sentence statements, that we would call

Concept Statements. These statements were to be discussed and evaluated during the next class.

During that next class, each student presented three Concept Statements, each one based on its own reasoning. One concept was finalized after discussion between us and the student. The most successful concepts were realized when the final Concept Statement reflected the Story Statement in the highest degree. After assuring myself that each student had an approved design concept, I asked them all to draw a second version of their storyboard that explained their final Concept Statement and Story Statement, how they connected it and how they achieved it. Each student was to then start designing and preparing conceptual drawings (plan, site plan, one elevation, one section) and a conceptual model for the project, to be discussed next design class.

4.3.8. Week 08: Putting All Things Together: Conceptual Design

Each student now having his/her unique design concept, this concept now would be used to start designing the project and to transform it from words and mental images to an actual product. Students were instructed to start the design process by reflecting on Concept Statements and reference[s], to create multiple abstract conceptual designs that would be evaluated by us in one-on-one juries. Students had freedom in choosing how to start to work at this stage, according to their preference: drawing sketches or 2D plans or creating 3D mass or imagining elevations or sections. The important point is that each abstract conceptual design[s] was to be positioned on the site plan, and in line with their design statement, findings from site Potentials & Constraints analysis, and

project program. After multiple discussions and pursuant to conceptual design options, each student got the green light to start preparing a conceptual site plan, plans, elevation, section, and model

The next class was a jury day to evaluate the final concept statement and conceptual design suggestion. Drawings and conceptual models were prepared by the students.

4.3.9. Weeks 09, 10, and 11: She Keeps Asking “Why?!”

After the mid-term jury day and feedbacks that the students received from us and another juror, they started the schematic stage in the design process. During this stage, I started to apply the *Why?* questioning process, over and over throughout the class, and I continued to do so until the design was sufficiently developed. This step is important in teaching the student to think by her/himself with respect to finding design solutions according to their Concept Statement and Story Statement; this helped them to become independent in their design decisions; this also helped students learn how to defend their approaches and decisions in the proper way. I informed my students of a new discussion rule: If I asked a *Why?* question regarding any design solution or decision that student presented, and the student didn't give a clear answer, then we, the tutors, would reject their design solution.

This new rule caused some students to be afraid to make a design decision, due to their fear of rejection by us. They thought that our evaluation would be built on liking or hating, rather than on logic and reason. To ease their worries and to address their

need for our approval of their every step, I explained that if their decisions were backed up by their own concept statement and by the design criteria that we had already agreed on, they should not have any problems with us. Our involvement as tutors at this stage was to make sure that students remained true to their concept, and to ensure that their schematic designs worked.

When a student faces difficulty in choosing what solution to follow, or in determining if the solution is truly okay, I answer the concerns by means of storytelling. I ask an apprehensive student to imagine him or herself from the other side, as if he or she were the client or the user of this building: Would they approve this design? What experience would the user gain from arranging spaces this way or that? Would they understand the presentation? Here, the student learns to seek the answer from a different point of view by being on the other side of things.

Continuing to ask *Why?* caused the students to give me a nickname, “The Why Teacher,” and in certain cases resulted in frustration and anger on the part of some students. But we kept encouraging them to work more and to review their work together, going two or three steps back to figure out what went wrong or what point they might have missed. When they got it right, we could sense joy and a feeling of pride and accomplishment from them.

This stage extended until Week 10, and the next week, 11, was spring holiday break. So, we asked them to work on developing their plans, sections, elevations, and models for evaluation during the first class after the holiday.

4.3.10. Weeks 12, 13, 14, and 15: Design Development

The first lesson after the holiday was a jury day, to evaluate the progress of students' schematic designs. Students were asked to show us their design progress from the concept-finding stage through this date. During the jury, my colleague and I focused primarily on students' verbal presentation skills and drawing graphics. We wanted to see if they had improved in expressing their ideas and if they were able to respond to our questions with good logic and reason.

After finishing our evaluation of their work and of their presentation skills, we asked the students to modify their designs according to jury notes and feedback and to keep working on project design and program. This continued until the beginning of Week 15. Pre-final jury was held during the last lesson in this week.

4.3.11. Final Evaluation

The final jury day was held after nearly two weeks, as each student presented full documentation and architectural works of their final product, and a model. The jurors were drawn from the faculty. I prepared a questionnaire (02). The questionnaire consisted of 12 questions to be filled by jurors. It was intended to evaluate each student work and progress after his/her presentation to the jury. I did not fill out this questionnaire, nor was I part of the jury committee.

I as a researcher or teacher of these students hadn't any jury activities in this day, I was interested in observing student skills in presenting their designs and how they conduct their discussion with the juror members. Most of the students were relaxed

when they explain their stories and concept findings, and how they construct their concept statement, then how this concept developed to their final design. They were enjoying this process and mentioned how in some parts of design details or decision was personal to them.

Another observation was their chosen language to use in the jury, most of them- except 3, chose English to communicate and to express them self to the jury member. They were confident in using their own words and design expression, this was notice immediately by the jurors and was one of the complements they give to them before starting discussion the design.

Questionnaire (03) was prepared by me, so that I could record student reflections and evaluation regarding the use of storytelling in design studio. I completed the questionnaire based on my informal conversations with students after they finished their jury presentations. This questionnaire consists of ten questions.

4.4. Questionnaires Analysis and Findings

To measure student's improvement after applying storytelling in design studio class. A comprising among the three different findings is conducted: Sketch Design Evaluation by Teachers, Final Jury Evaluation by Jurors (Medial Calc.) and Performance Self Evaluation by Students. In addition, all the 6-Criteria Based questions in any of the three questionnaires was brought to the closest to other questions in the comparison; the results of this comparison are in the next chapter.

4.4.1. Questionnaire 01: Design Exam Evaluation (Before)

As mentioned before, this is the same questionnaire that been used in phase one, so it will follow the same analysis, but the sample is smaller (12 student) and been fill by the tutors of this class not the student. Questions number 01,02,03 are for understanding of design process. question number 04 for critical thinking. Questions number 05,06,07 are for creativity in concept finding & critical thinking. Questions numbers 08,09 are for independent thinking-strong design decision making. Questions number 10,11 are for ability of transforming information in coherent manner throughout design process. Question number 12 is for student design culture & emotional connection with design.

Table IV.9. Questionnaire 01: Design Exam Evaluation (Before) Results

| Questionnaire 01: Design Exam Evaluation (Before) | | | | | |
|---|---|---|--------------------------|------|--|
| No# | Question | Why I chose this question? | Answers (12 Students) | | What does the Finding indicate? |
| | | | YES | 100% | |
| 1 | Student starts working in clear design thinking process? | Hierarchy in design thinking helps build a solid understanding. | 5 | 42% | Teacher will have to focus more on how to enforce students to refer to an idea while starting the design and moving forward from this point |
| 2 | Did the student benefit from provided information of project program and description to get initial design ideas? | To measure the student understanding of project provided data and benefit from it in their design. | 5 | 42% | Teacher will have to emphasize on the importance of given data in design process and the layout formation of the project |
| 3 | The Student started designing by referring to an Idea | Hierarchy in design thinking helps build a solid understanding | 4 | 33% | Teacher will build on this right-thinking hierarchy and enhance it in a more coherent way |
| 4 | Student knows the difference between “an idea” and “a concept” | Differentiating between an Idea and a Concept is a major step into the implementation of design thinking. | 3 | 25% | Teacher will need to revive students’ knowledge about the difference between the idea and the concept and build better understanding of the usage of each in design process. |
| 5 | Design concept inspiration is? | To evaluate how student finds the concept after the idea was developed | 4 | 33% | Teacher will pay extra attention to teaching students how to find suitable concepts for their designs in a broader approach. |
| 6 | Concept inspiration enrich design uniqueness | To measure how students, develop their concept based on given inspirations and enrichen it further | 4 | 33% | Teacher will create a link between students and surrounding inspiration to help them use all the possible data available. |

| | | | | | |
|----|---|---|---|-----|---|
| 7 | Did the student present clear concept statement? | To tell whether students truly understand what they offer rather than scattered ideas that don't help create an understanding of the concept itself | 4 | 33% | Teacher will coherently help students become more self-critical in their thinking and help them become more direct. |
| 8 | It was easy for the student to defense his/her concept choice | To tell how confident and clear the students are in defending their ideas. | 4 | 33% | Teacher will help build a self-confidence and strong decision making among students through all the project design process |
| 9 | Student ability to defend his/her design decisions both in written statements and verbal discussions (Feedback & Jury)? | To measure the self-independency of the students when they present their ideas professionally | 2 | 17% | Teacher will thoroughly introduce professional practice methods to students to help them prepare for the market |
| 10 | It was easy for the student to express the concept visually | To measure student's presentation skills and information - transformation through stages of design | 3 | 25% | Teacher will work one-to-one with each student to help them build a strategy on how to always present and transform their ideas visually |
| 11 | the final output (visual language) reflect the concept | To measure student's success on moving from a stage to a stage in design process with the minimum obstacles. | 4 | 33% | Teacher will critically help students learn how to reflect their concept into a fresh winning product |
| 12 | the concept reflects the student Perspective of design | To measure student's engagement of oneself into their designs on a personal level | 3 | 25% | Teacher will help students on how to uniquely project their personality on their designs which will help personalize their designs to leave a fingerprint |

4.4.2. Questionnaire 02: Jurors Feedback

Understanding Design Process (Red)

Creativity in Concept Finding & Critical Thinking (Green)

Ability of transforming information in coherent manner through out Design process (Blue)

Critical Thinking (Grey)

Independent Thinking-Strong Design Decision Making (Purple)

Reflective Thinking - Student Design Culture & Emotional Connection with Design (Yellow)

01-(site analysis and findings) was enriched by student personal experience in the location Y M N

02-Reflecting student personal experience in the site analysis helped achieve deeper understanding of project location and characters Y M N

03-The student deep understanding of site- personal experience analysis helped in finding unique story which is connected to this specific project location and characters (story finding) Y M N

04-Student telling the story then draw it (storyboard), helped to understand the story merits that will be reflect in the next phase _ concept finding Y M N

05-Creative story merits ,creates creative concept finding Y M N

06-Strong / clear storytelling by student leads to strong / clear concept explaining Y M N

07-clear creative concept , achieve clear creative design solutions Y M N

08-The student has his/her own creative design solutions which reflect his/her own story-concept Y M N

09-The relation between story finding , concept development and the final design is strong unique Y M N

10- The stronger the Storytelling, the more creative is the concept Y M N

11- Storytelling lead to unique design concept that is related to student preferences Y M N

12- storytelling help in achieving Connection between concept merits and the final design product Y M N

Y Yes M Maybe N No

Figure IV.20. Questionnaire 02: Design Final Jurors Feedback Diagram Analysis

This questionnaire is filled by juror 01 and juror 02 in the final jury day. The researcher did not participate in this jury committee or filled this questionnaire. Questions number 02,07,12 are for understanding of design process. question number 10 for critical thinking. Questions number 01,03 are for creativity in concept finding & critical thinking. Questions numbers 05,06 are for independent thinking-strong design decision making. Questions number 04,09 are for ability of transforming information in coherent manner throughout design process. Question number 08 is for student design culture & emotional connection with design.

Table IV.10. Questionnaire 02: Jurors Feedback Findings

| Questionnaire 02: Jurors Feedback | | | | | |
|-----------------------------------|---|-----------------------|------|---------|------|
| No# | Question | Answers (12 Students) | | | |
| | | Juror 1 | | Juror 2 | |
| | | YES | 100% | YES | 100% |
| 1 | (Site analysis and findings) was enriched by student personal experience in the location | 10 | 96% | 8 | 67% |
| 2 | Reflecting student personal experience in the site analysis helped achieve deeper understanding of project location and characters | 11 | 92% | 7 | 64% |
| 3 | The student deep understanding of site- personal experience analysis helped in finding unique story which is connected to this specific project location and characters (story finding) | 11 | 92% | 10 | 83% |
| 4 | Student telling the story then draw it(storyboard), helped to understand the story merits that will be reflect in the next phase - concept finding | 10 | 83% | 9.5 | 79% |
| 5 | Creative story merits, creates creative concept finding | 11 | 92% | 7.5 | 62% |
| 6 | Strong / clear storytelling by student leads to strong / clear concept explaining | 10 | 83% | 7 | 58% |
| 7 | Clear creative concept, achieve clear creative design solutions | 7.5 | 62% | 8 | 67% |
| 8 | The student has his/her own creative design solutions which reflect his/her own story-concept | 8.5 | 71% | 8 | 67% |
| 9 | The relation between story finding, concept development and the final design is strong unique | 6.5 | 54% | 7 | 58% |
| 10 | The stronger the Storytelling, the more creative the concept is | 11 | 92% | 8.5 | 71% |
| 11 | Storytelling lead to unique design concept that is related to student preferences | 10 | 83% | 9.5 | 79% |
| 12 | Storytelling helps in achieving Connection between concept merits and the final design product | 8.5 | 71% | 9 | 75% |

4.4.3. Questionnaire 03: Students Feedback after applying Storytelling

Understanding Design Process **Creativity in Concept Finding & Critical Thinking** **Ability of transforming information in coherent manner through out Design process**

Critical Thinking **Independent Thinking-Strong Design Decision Making** **Reflective Thinking - Student Design Culture & Emotional Connection with Design**

01- did story finding technique help you to be more aware of useful data that you can use in finding ideas and concept creating? Y M N

02-when applying storytelling as a design tool in your concept creation, did that help you in thinking outside the box with more ways of problem solving (creative critical thinking)? Y M N

03- when you write down your story then draw it then share it with your colleagues and tutors visually & verbally in different stages, did that deepened your understanding of your concepts merits? Y M N

04- did using the "what if?" As a concept statement technique in concept creation phase help you to present clear concept outline for future design developments? Y M N

05- "clear storytelling leads to clear concept explaining". Did storytelling prepare you to present your concept and ideas easier and simpler than before? Y M N

06- when applying storytelling as a design tool, did that help break the ice and encourage you to present your design decisions in complete confidence? Y M N

07- writing down your story then draw it and share it with your colleagues and tutors as a story teller in different stages, strength your design presentation skills (writing & verbally)? Y M N

08- using storytelling in design thinking, Helped the final output (visual language) to reflect the concept you chose? Y M N

09- storytelling help to create emotional connection and bond between you and your design? Y M N

10- storytelling as a design tool help reflecting your own design culture and style in project design? Y M N

PH.D. RESEARCH PRESENTATION
Danah Tuffaha

Figure IV.21. Questionnaire 03: Students Feedback on Applying Storytelling in Design Class Analysis Diagram

This questionnaire is filled by the researcher in informal discussion with her students after they finish jury discussion. Questions number 06,07,08 are for understanding of design process. question number 10 for critical thinking. Questions number 01,10 are for creativity in concept finding & critical thinking. Questions numbers 02,05,09 are for independent thinking-strong design decision making. Questions number 03,04 are for ability of transforming information in coherent manner throughout design process. Question number 10 is for student design culture & emotional connection with design.

Table IV.11. Questionnaire 03: Students Feedback After Applying Storytelling
Results

| Questionnaire 03: Students Feedback after applying Storytelling | | | | | |
|---|--|---|-----------------------|------|--|
| No# | Question | Why I chose this question? | Answers (12 Students) | | What does the Finding indicate? |
| | | | YES | 100% | |
| 1 | Story finding technique help you to be more aware of useful data that you can use in finding ideas and concept creating | To measure the student understanding of project provided data and benefit from it in their design. | 11 | 92% | Teacher will have to focus more on how to enforce students to refer to an idea while starting the design and moving forward. |
| 2 | When applying storytelling as a design tool in your concept creation, did that help you in thinking outside the box with more ways of problem solving (creative critical thinking)? | Hierarchy in design thinking helps build a solid understanding. | 8 | 80% | Teacher will have to emphasize on the importance of given data in design process and the layout formation of the project |
| 3 | When you write down your story then draw it then share it with your colleagues and tutors visually & verbally in different stages, did that deepen your understanding of your concept's merits | Hierarchy in design thinking helps build a solid understanding | 10 | 83% | Teacher will build on this right-thinking hierarchy and enhance it in a more coherent way. |
| 4 | Did using the "what if?" As a concept statement technique in concept creation phase help you to present clear concept outline for future design developments | Differentiating between an Idea and a Concept is a major step into the implementation of design thinking. | 11 | 92% | Teacher will need to revive students' knowledge about the difference between the idea and the concept and build better understanding of the usage of each in design process. |

| | | | | | |
|----|--|--|----|-----|--|
| 5 | “Clear storytelling leads to clear concept explaining”. Did storytelling prepare you to present your concept and ideas easier and simpler than before? | To evaluate how students, find the concept after the idea was developed. | 10 | 83% | Teacher will pay extra attention to teaching students how to find suitable concepts for their designs in a broader approach |
| 6 | When applying storytelling as a design tool, did that help break the ice and encourage you to present your design decisions in complete confidence? | To measure how students, develop their concept based on given inspirations and enrichen it further | 11 | 92% | Teacher will create a link between students and surrounding inspiration to help them use all the possible data available. |
| 7 | Writing down your story then draw it and share it with your colleagues and tutors as a storyteller in different stages, strength your design presentation skills (writing & verbally)? | To tell whether students truly understand what they offer rather than scattered ideas that don't help create an understanding of the concept itself. | 11 | 92% | Teacher will coherently help students become more self-critical in their thinking and help them become more direct. |
| 8 | Using storytelling in design thinking, Helped the final output (visual language) to reflect the concept you chose? | To tell how confident and clear the students are in defending their ideas. | 9 | 75% | Teacher will help build a self-confidence and strong decision making among students through all the project design process. |
| 9 | Storytelling help to create emotional connection and bond between you and your design? | To measure the self-independency of the students when they present their ideas professionally. | 8 | 67% | Teacher will thoroughly introduce professional practice methods to students to help them prepare for the market |
| 10 | Storytelling as a design tool help reflecting your own design culture and style in project design Figure? | To measure student's presentation skills and information transformation through stages of design | 9 | 75% | Teacher will work one-to-one with each student to help them build a strategy on how to always present and transform their ideas visually |

V. EXPERIMENT FINDINGS AND RESULTS

After finishing all research experiment phases, the researcher studied the results of questionnaire (01), (02) and (03) to detect if improvements occurred to student's design learning curve and design skills after applying Storytelling in design studio as a learning and design tool. To achieve this, the researcher conducts a comparison of questionnaires results between phases (before and after). As mentioned before, there are 6 factors to be evaluated before and after applying storytelling in design studio. any changes in results will affect the student level of improvement. These factors are:

- Understanding design process
- Critical thinking
- Creativity in concept finding
- Independent thinking and design decision making
- Ability of transforming information
- Student design culture & emotional connection with design



Figure V.1. Improvement and Evaluation Factors

To evaluate and analyze these results, the researcher connected between the shortcoming and challenges in design studio with the research improvement strategies, then connect each strategy with a factor to evaluate.

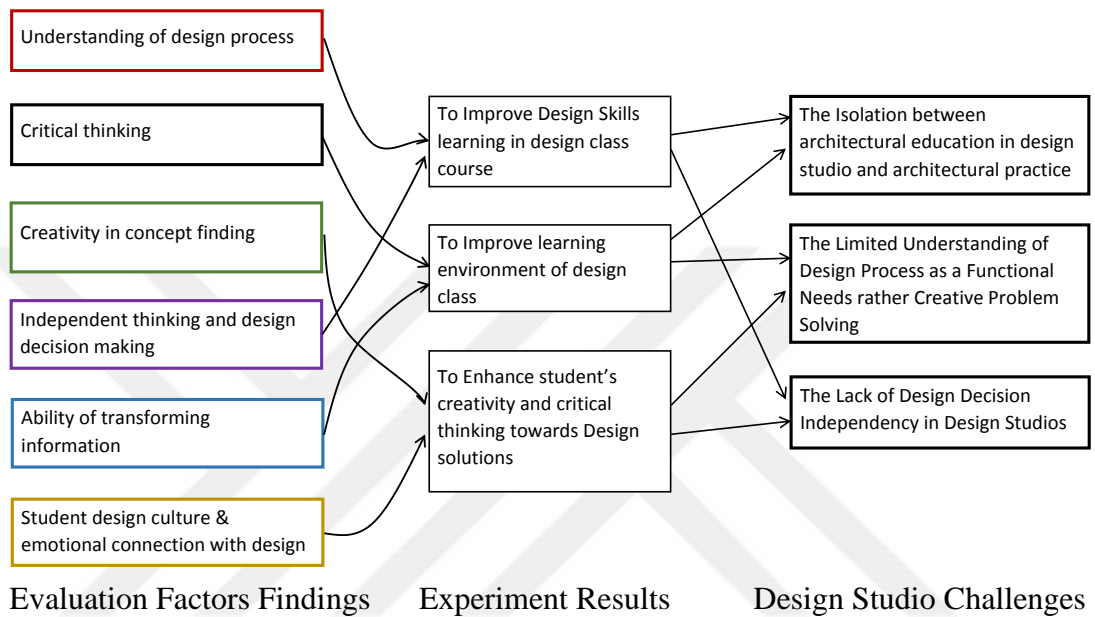


Figure V.2 Connection of Research Design Studio Challenges Points with Improvement strategies and Factors to Evaluation

5.1. Understanding of Design Process

Understanding design process is important to improve student design skills. To evaluate progress for this factor, findings of (before / after) for Figure V.3, Figure V.4, and Figure V.5 are examine.

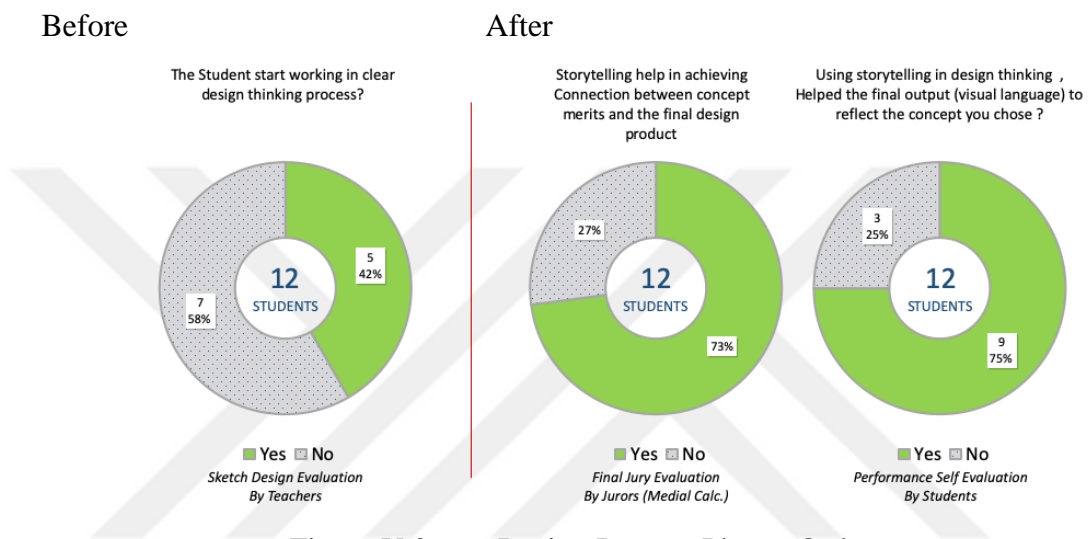


Figure V.3. Design Process Phases Order

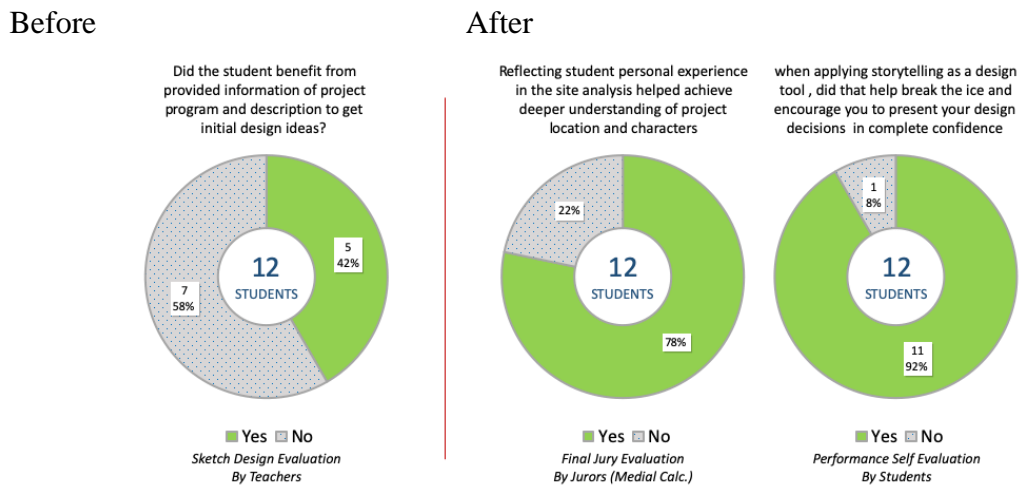


Figure V.4. Information Analysis benefits

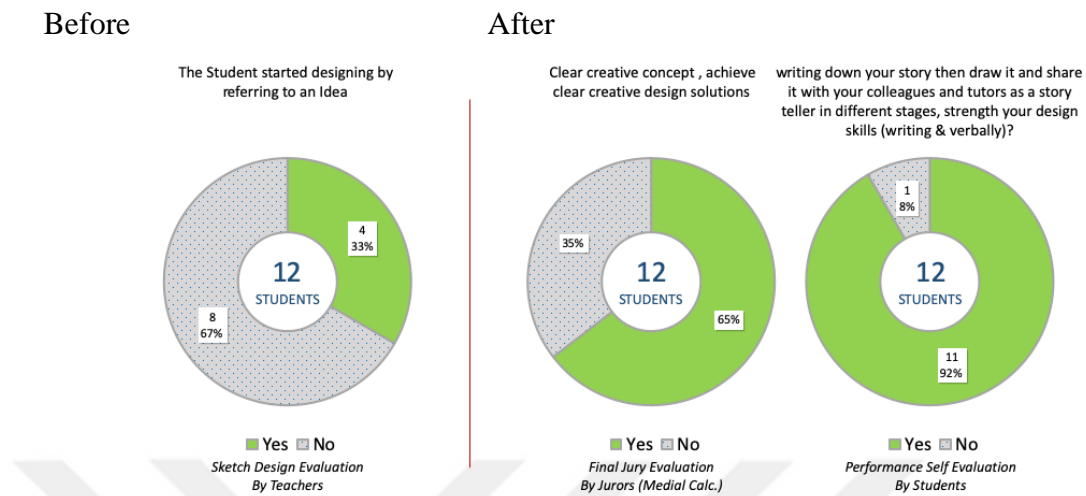


Figure V.5. Starting with Project Related Ideas

Studying Figure V.3 regarding understanding the design process order, before applying storytelling in class, 5 out of 12 students know the importance of moving from one phase to another in designing, and what to do in each phase. But after applying storytelling, 9 out of 12 understand the importance of following the order of design process, and to give each phase the proper effort especially in project design initial phases. This is connected to the next Figure V.4 which is related to benefiting from project data and information they collect in the beginning of the design process.

Before the experiment, 7 out of 12 students did not benefit from the provided information and data they had when designing, and they didn't know how to use them and when. But after the experiment, 11 of 12 students, understood that provided data regarded any project should be collected, research and analyze in manners that will help them to achieve better design choices. And these data are important in all design process. Saying this, the third Figure V.5 is about starting design with proper idea or

concept for the project. before only 4 of 12 students started design with a concept, but after applying storytelling, 11 of the 12 understand that when they start designing they should have clear, related design concept in the beginning of design process, as it what will keep them focus on what they are trying to create throughout the process.

Referring to these figures, an improvement in result can be detected related to students understanding of design process after applying storytelling in design studio, these improvements are reflected in the juror's feedback too. Students better understanding of design process order and how should they start the process and benefit from each phase especially in the initial stages, help them not to jump to design conclusion without studying and analyzing the different project merits like, clients demands, zoning laws, social fabrics,...., etc. and by using storytelling as a tool they combined these data with their personal feedback from actual experiences to guide them to create suitable design solution/ concept for any project task they might deal with in the future.

5.2. Critical Thinking

Referring to Figure V.6 Enhancement of Creative Critical Thinking , only 3 out of 12 students knew the difference between an idea and a concept of design , as ideas usually are direct problem solving like the need to have direct connection between two spaces, concepts are connected to how this problem solution will be implemented in a way that is related to the design as a whole. This factor is connected to understanding of design process factor, especially regarding finding creative and proper concepts to work with at the beginning of the design process. By using storytelling as a tool to improve the learning environment in the studio, by becoming a tool to practice critical thinking by reflecting on research and analysis findings time after time, and each time to reconstruct these findings from different point of view will generate different outcomes of design.

After the experiment, 9 out of 12 knows the difference between an idea and a concept. This result shows they understand the relationship between an idea and a concept, were design concept is the tent that all the design ideas falls under it, and learned to understand collected data and research findings in a deeper level by reflecting repeatedly on them using different approaches, then try to look beyond what is in front of them until they build the final story structure . This improvement was noticed by the final jurors too. This factor is related to the next factor which is Creativity in Concept Finding.

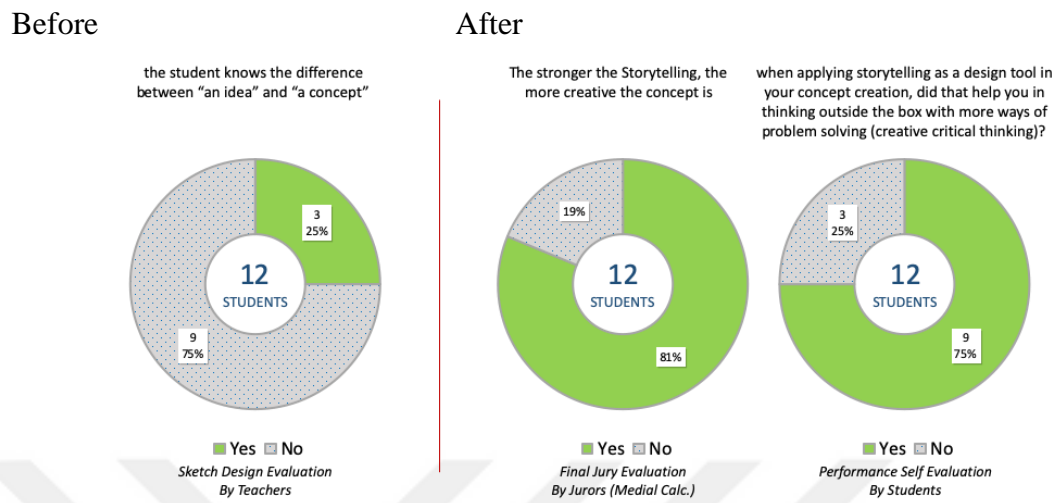


Figure V.6. Enhancement of Creative Critical Thinking

5.3. Creativity in Concept Finding

This factor is related to enhance student creativity toward design solution. As mentioned above in design process phases, the initials phases usually are the hardest ones because concept finding is within these stages. Students may get lost in this stage and might don't know how to find concept inspiration. Referring to Figure V.7, 8 out of 12 students before the experiment their concepts -if found- was direct functional. This was reflected in tier jury discussion as they start explaining their design by pointing to construction elements and tier location in plans or elevation. Other students may present 3D sketches that has no connection to the project program or location.

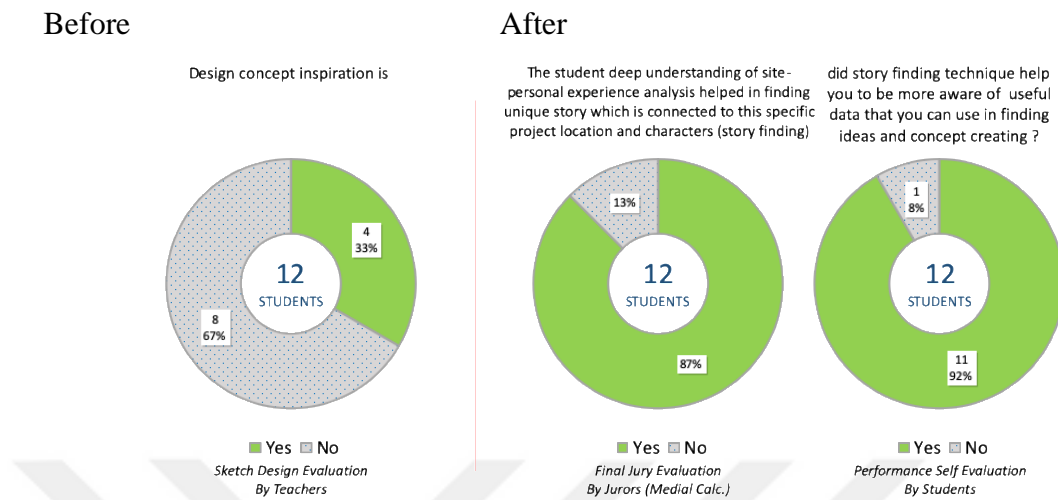


Figure V.7. Inspiration References

Referring to the previous factor, using storytelling as a tool to practice critical thinking when approaching design problem-solving give them the chance to look for inspiration from different sources related to their project like program, location, social and cultural elements, user, myths, etc. this is reflected in Figure V.7 after findings, 11 out of 12 students found that practicing story finding can help in concept finding. We don't want them to literally copy/ paste what they found, but to reconstruct their findings in a creative way, and to push them self to think out of the box. Applying storytelling help to do this, as Figure V.8 shows that 9 out of 12 students agreed that using storytelling in design process helped them to think in broader ways to create their design concepts, and these concepts has some originality to them, as they reflect what they understand from the collected data and ideas, but had the chance to reflect their personal preferences into the design without losing the project original purposes and values. These analyses agreed with the improvement percentage from jurors as Figure V.9 shows.

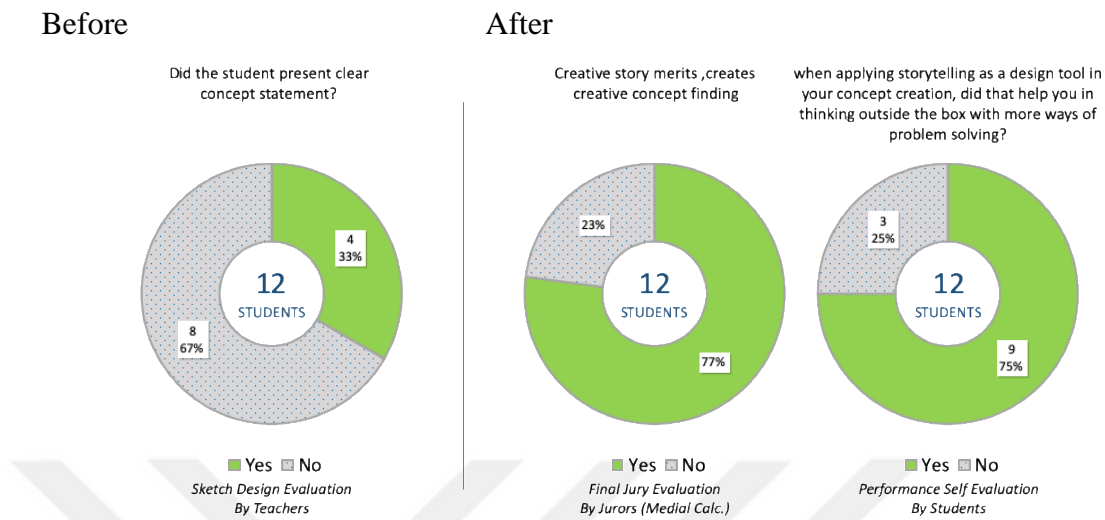


Figure V.8. Thinking Outside of The Box

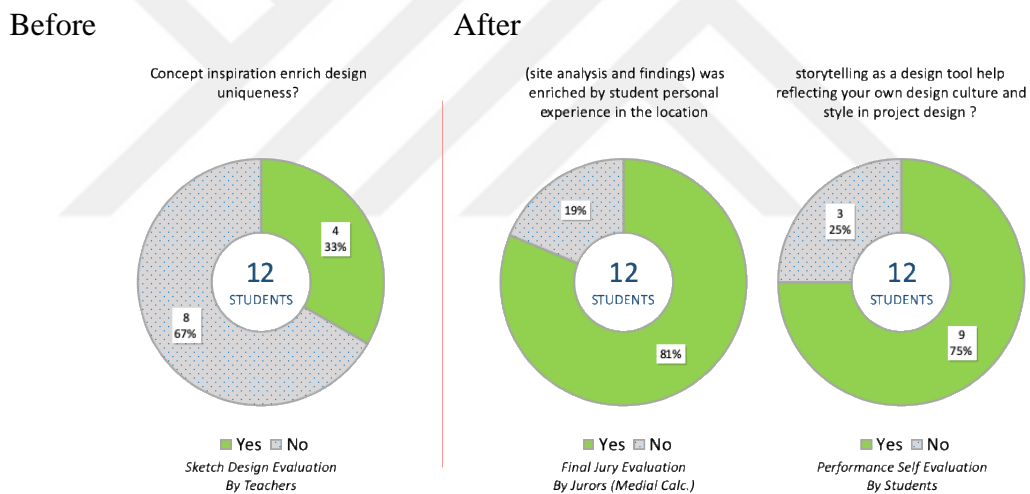


Figure V.9. Originality of Concepts

This factor has connection to improve design skills for architect design students. After the student learn how to find a concept and from where, then to reflect his/ her experience in it, they become more aware why they chose their design concepts, as Figure V.10 findings shows that 10 out of 12 students benefit from using storytelling to advance this skill.

5.4. Independent Thinking and Design Decision Making

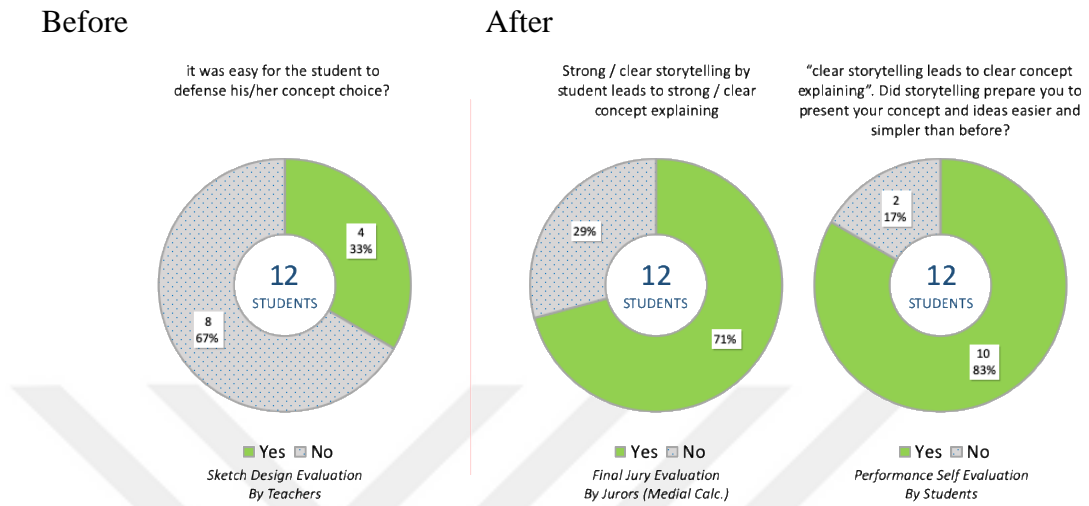


Figure V.10. Concept Selection Process

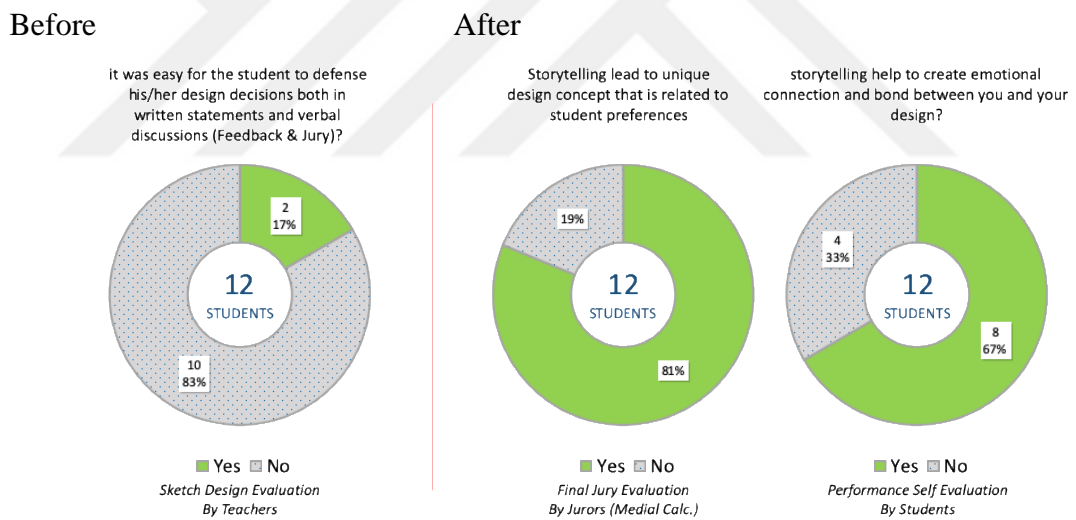


Figure V.11. Strong Decision Making

When student have clear concept statement, they can defend their design solutions in front of juries or to their colleagues in clear and simple sentences verbally or written , as Figure V.11 findings shows, because they learn to take design decisions throughout

the design process by keeping referring to their final story and emotions that created the concept statement. The improvement in this factor was noticed by jurors in the final jury day, each student was responsible to present design concept and design development and decision by them self without any help from their teacher.

5.5. Ability of Transforming Information

The ability of transforming information in a coherent manner between stages is one of many ways to improve the learning in design studio. Student ability to move from the verbal and written presentation of concepts to physical design elements and configuration is a long process to master, but using storytelling help them to start learning this skill. As Figure V.12 and Figure V.13 shows, keeping expressing the story they created in different stages with different mediums deepened student understanding of her/his concepts merits and unique characteristics, then to choose the proper references or design compositions. This was a good improvement for student design skills as before the experiment only 3 out of 12 students know how to do this, but after the experiment 10 out of the 12 learned how to so. This improvement can be sense from juror feedback as most of the final designs output can be traced back to the beginning of the design process.

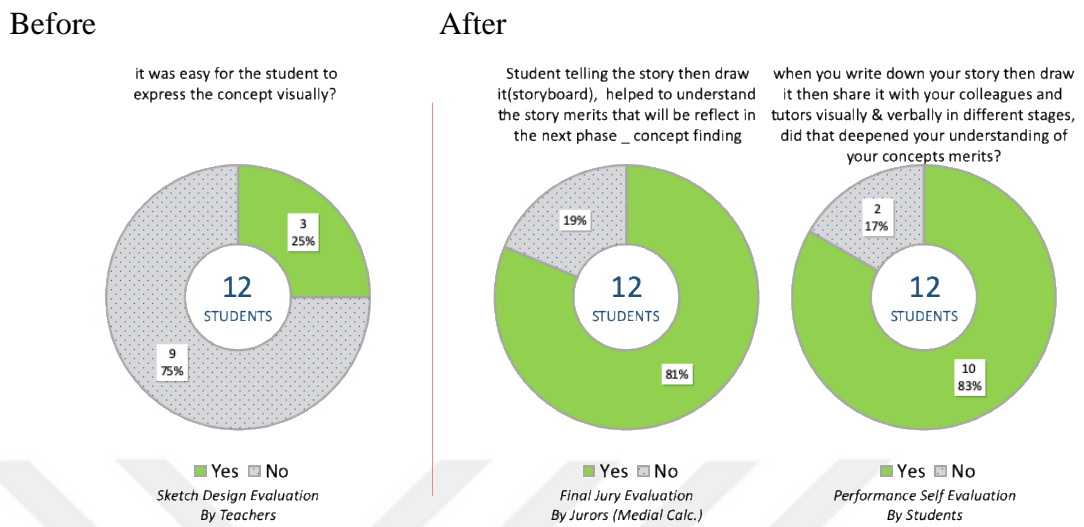


Figure V.12. Coherent Manner Throughout Design Process

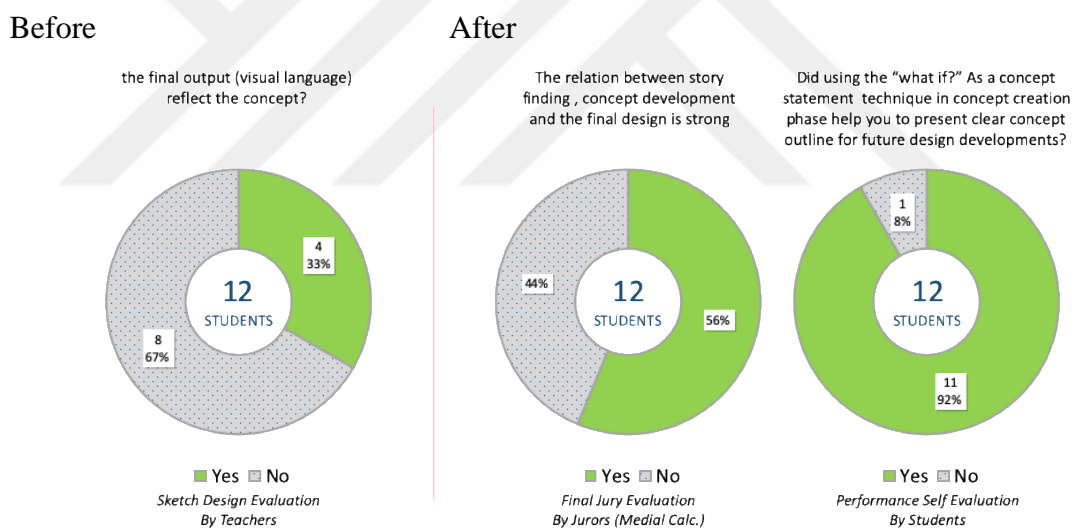


Figure V.13. Successful Transformation of Concept Between phases

5.6. Student Design Culture & Emotional Connection with Design

This factor connected to enhancing student creativity, as mentioned in previous factors, the idea of using storytelling in as design tool to achieve a level of emotional connection between students and their designs. These emotion connections are built on students experience regarding an event related to the project and their personality as designers. Figure V.14 shows that before the experiment, 9 out of 12 students had no emotional connection to their designs and they didn't think it reflect them as designer. As they learned how to reflect their experiences and personality with project findings and data analysis, 8 out of 12 managed to build a level of emotional connection with their designs, and as teachers we could sense their designer's personality in their design's outputs. Another advantage of this factor is, emotional connection between student and her/his design make them aware of their design decisions and can do it by them self because these designs reflect their preferences, as shown in Figure V.15.

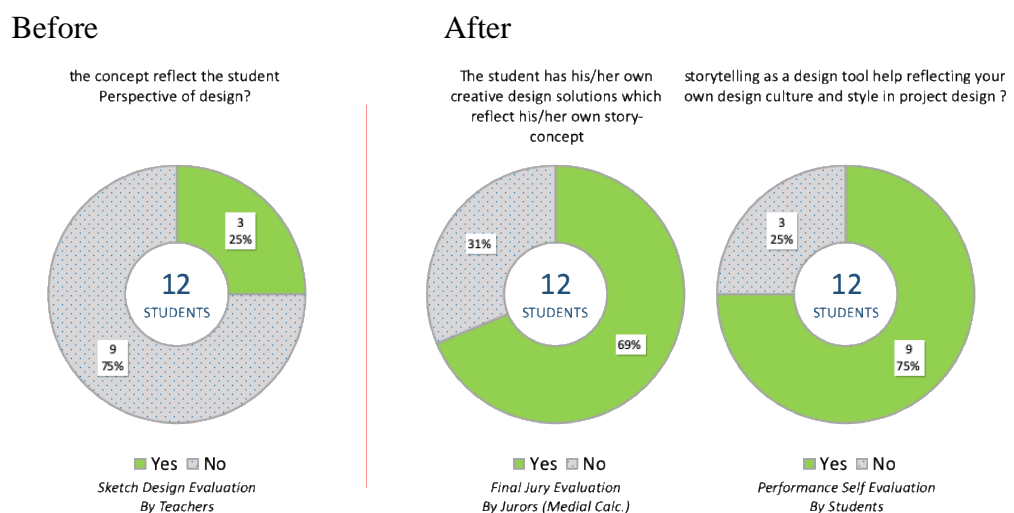
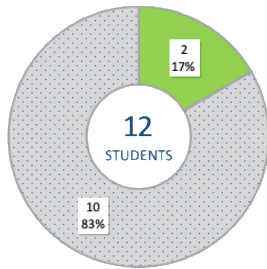


Figure V.14. Student Design Culture Reflection

Before

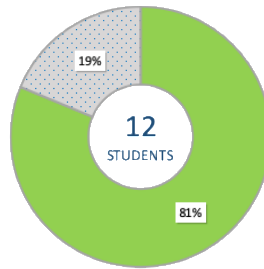
it was easy for the student to defend his/her design decisions both in written statements and verbal discussions (Feedback & Jury)?



■ Yes ■ No
Sketch Design Evaluation
By Teachers

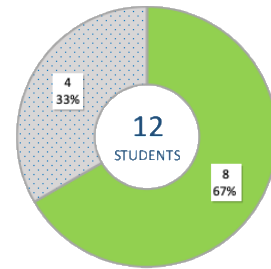
After

Storytelling lead to unique design concept that is related to student preferences



■ Yes ■ No
Final Jury Evaluation
By Jurors (Medial Calc.)

storytelling help to create emotional connection and bond between you and your design?



■ Yes ■ No
Performance Self Evaluation
By Students

Figure V.15. Student Emotional Connection with Design

Table V.1. Findings Changes Comparison

| Improvement & Evaluation Factors | | Criteria | BEFORE | AFTER | | Comparison ratio |
|----------------------------------|---|---|--------|-----------------------|-------|------------------|
| | | | Q1 | Q2 | Q3 | |
| | | | Yes % | Yes % Medial Calc. | Yes % | |
| 1 | Understanding of Design Process | Design Process Phases Order | 42% | 73% | 75% | 32% |
| | | Information Analysis benefits | 42% | 78% | 92% | 43% |
| | | Starting with Project Related Ideas | 33% | 65% | 92% | 45.5% |
| 2 | Critical Thinking | Enhancement of Creative Critical Thinking | 25% | 81% | 75% | 53% |
| 3 | Creativity in Concept Finding | Inspiration References | 33% | 87% | 92% | 56.5% |
| | | Thinking Outside of The Box | 33% | 77% | 75% | 43% |
| | | Originality of Concepts | 33% | 81% | 75% | 45% |
| 4 | Independent Thinking and Design Decision Making | Concept Selection Process | 33% | 71% | 83% | 44% |
| | | Strong Decision Making | 17% | 81% | 67% | 57% |
| 5 | Ability of Transforming Information | Coherent Manner Throughout Design Process | 25% | 81% | 83% | 57% |
| | | Successful Transformation of Concept Between phases | 33% | 56% | 92% | 41% |
| 6 | Student Design Culture & Emotional Connection with Design | Student Design Culture Reflection | 25% | 69% | 75% | 47% |
| | | Student Emotional Connection with Design | 17% | 81% | 67% | 57% |

DISCUSSION

An experiment related to applying Storytelling as an alternative learning tool in design studio to improve student design learning environment and to help them to enhance design skills. To examine storytelling effect on student learning, the researcher conducted an experiment on a sample of architecture student in design studio class at Okan University, Istanbul. The course has been designed to apply storytelling in two ways, as a learning tool to improve the learning environment of the design class, and as a design tool in design process to enhance student design skills. As shown in Findings Chapter, the findings have been divided into six factors, each factor is connected to a research result. Which are supposed to fix a challenge of learning design skill in design studio as shown in Figure V.2 in chapter [V].

The experiment outcomes are from two phases: (1) Observation and Data Collection, and (2) Applying Storytelling. In the experiment phase one, beside the thorough data collection process and the questionnaires both verbal and written, the researcher agreed with Okan university to participate in some of the design studios classes as an attendee to evaluate the current student situation. The collected data and observation not only helped the researcher define the requirements but also paved the road to learn exactly how to conduct the second phase of the experiment. Most, if not all, the observations combined with the questionnaire noted in phase one were graphically visualized and described for analysis in Design Studio Chapter. The

findings and results in return determined the areas and criteria for which the researcher paid all the attention in phase two, applying storytelling.

In order to organize the collected data, the researcher has categorized the analysis in two main categories where the first category deals with the design studio learning environment and the second category deals with the design skills learning. In addition to the observation properly categorized, the questionnaire was analyzed as a whole point as the methodology of collecting the data was quantitative while in the observation section it was qualitative. The analysis shows the strong and weak points in design studio class at Okan university. As this research main goal is to help student improve their design skills, the researcher in the second phase mainly focused on the weak points.

Some of are weak points signals the existence of challenges of learning design skills in this design studio sample in varied percentages. some of the results showed the existing of isolation between student designs solutions and to whom and where they are designing for; they didn't relate to the data that was presented to them either by their tutors in the project program or data analysis. This caused some of the project outcome to be problematic designs rather than outcomes of responding to the design requirements.

Another isolation form was between the students themselves and their designs; this can be sensed in their discussions with their tutors or other students. Some result showed that some of the students preferred rather to dominate their individualism over the design requirements while others showed no deep interest in the subject which in

both cases, the disconnection was obvious. These symptoms caused the tutors to be more than a design development supporter, but to be the designer in some cases, or just keeping fixing and solving design problems student keep creating throughout the design process. This made the tutors exhausted and directed them away from enjoying the process of creating something new with their student.

Given the previous notes with other observational results reflected in a major challenge for both the teacher and the students which is the lack of independency of design decision skills; as mentioned above, students emotional connecting to their design was slightly unbalanced. This caused the tendency of not taking design decision between students, as they aimed for their tutor to help them find solutions for the problems they encountered with. This puts more pressure on the tutors and is time consuming.

The last factors results are reflection of the limited understanding of design process as a design approach, phases purposes, hierarchy and transmission of information. In my opinion, this challenge has direct effect to the other two. As reflected in the results, when students don't know how to use the data they collected and analysis in the initial phases, they will most likely to fail in responding to the design task requirement, plus they will not be able to clearly establish an emotional connection because they will start the design process in the mentality of fixing rather than creating, especially if they did not have proper background regarding concept creating and critical thinking. In some cases where students have background regarding creating concept design, they presented concepts that are incoherent with project program or merits like, social and

culture characters, users, regulation...etc. this contribute to the isolation between the academia and practice, student will be designing only according to their preferences.

After finishing phase one, the researcher conducted an on-site experiment to apply storytelling as a learning tool in design studio class. The student sample in phase two included some of the students who were in the sample of phase one. The semester course the researcher tailored a strategy on how to apply storytelling on this group. This strategy was based on reflection and experience learning theories; which were previously explained in the literature review. This strategy comprises two main approaches: (1) Model One: Teaching and Learning Model and (2) Model Two: in Design Process.

The first approach dealt with the researcher as a teacher using storytelling and narratives as an interactive teaching style in design studio environment. Reflecting on phase two results, using this approach helped students in return to use storytelling as a learning tool as well. This ensures that both the teacher and the students are on the same page using storytelling.

According to the experiment findings and results, students design skills learning has improved. They became more aware of the importance of taking some time to study and understand project information that was presented to them or the information they found through research and analysis. The outcome of using this teaching approach is to move students from surface learning to deep learning. Furthermore, students now understand the importance of what they are learning and reflect on it.

The first approach results have also prepared the students for using the second approach which was to use storytelling as a design tool within the project design process. According to the diagrams and the results explained in the experiment chapter, students learned a new method on how to use narratives in finding and developing their concepts. Not only this helped students give meaning to the tiniest details in the project, but also, they became aware of the importance of concept creation in decision making, creative problem solving and selling the design.

As shown in experiment findings and results chapter, applying storytelling as a design tool between programming and schematic design phases has proved this method to leave a positive impact and significant improvement on student design skills. A written illustration of this improvement can be sensed from the moment students go on a site visit and collect information about the project site. Each student has their own personal interpretation of the site information based on their previous experiences and preferences. This interpretation combined with the experience resulted in an initial story board in their mind. These stories kept developing and evolving into better stories until one final story is focused on for next step of design. Building up stories each time gives the students a space for critical thinking as they are introduced to different beginnings and endings of their stories. Critical thinking gives the student the ability to see the prospect design from different angles and in peer-review feedback. On a personal level, students learned how to collaborate with peers and classmates as storytelling requires engagements with the surroundings. Communication with the teacher and structuring feedbacks has become more effective. This in combination with the student emotional

and cultural input will later widen student's imagination to create design concepts that reflect the project site and information.

As the concept and story develop, students became critically attached to their designs. They start to independently criticize what they do and make better decisions when they are encountered with a problem. It will also develop their ability to transform their ideas into both digital and verbal presentations which will result in a more profound submission. Eventually, and this is a very important note of the process, students learn step by step how their concept, design process and development are being taken care of from the early stages of design until the final submission. This eliminates any unexpected or unwanted problem at the submission phase. Thus, they become more confident and aware of what they do when confronted with a jury or third party.

Although the two approaches put together relatively helped overcoming most of the challenges in design studio class, it would have shown more improvement if some of the unseen factors affected the experiment. For instance, the idea that students had to work in groups within the story finding stage has resulted in less independent thinking than expected. However, given the shortcomings in design studio, the introduction to this method of teaching and learning required both parties to put extra effort to make this experiment succeed. Of course, these are challenges that exist in every class and need particular methods to deal with.

Other constraints limited the results of the experiment that both the teacher and students had no take on it such as the project program sector, site location level of

complexity, experiment time, students' academic level and other minor restrictions that can be dealt with in later experiments which the researcher highly recommends.

In overall, this experiment has proved storytelling to be an effective learning tool in design studio classes, among other tools, that can help students gain efficient learning, meaningful learning, deeply understand the design process, collaborate and interact.



Table 0.1 Summary of activities differences between conventional class and the experiment class in the first 8 weeks

| Week No. | Design studio activities | Applying | | Additional activities |
|----------|--|--------------|----------------|---|
| | (as scheduled by the department) | Conventional | The Experiment | (related to the applying storytelling) |
| 1 | General Meeting & presenting project criteria | ✓ | ✓ | <ul style="list-style-type: none"> Each student introduces her/his self by talking about their backgrounds, culture, family, achievements..., etc. |
| 2 | Evaluation of students' current design and presentation skills | ✗ | ✓ | <ul style="list-style-type: none"> Sketch design exam and presentation of previous design works done by students |
| 3 | Site visit | ✓ | ✓ | <ul style="list-style-type: none"> At the end of the site visit each student to write down their thoughts and reflect on site visiting experiences on this day |
| | Site analysis & data collection | ✓ | ✓ | <ul style="list-style-type: none"> Each student shares a story verbally reflecting on site visit day, reading from their notebook Connecting site potentials & constraints analysis with student site visit stories Discussing main project program which students will develop through storytelling phase in relation to their stories and analysis |
| 4 | Presenting suggestions for design solution ideas or concepts | ✓ | ✗ | <ul style="list-style-type: none"> Story Finding: Students rewrites their focused stories that they develop from the site visit or find from research and site analysis phase |

| | | | | |
|---|------------------------------|---|---|---|
| | | | | <ul style="list-style-type: none"> • To create a matrix connecting site potentials & constrains, project program, selected research data with their focused story |
| 5 | Initial Schematic design | ✓ | ✗ | <ul style="list-style-type: none"> • Student re-focused Story by re-writing it, telling it and drawing it (storyboard) • The project matrix • Story expanding by relating emotionally to their stories by giving them deeper meaning • Write Story statement • Keywords from their stories • Keywords references |
| 6 | Schematic design development | ✓ | ✗ | <ul style="list-style-type: none"> • Story processing, a matrix connects words and their meanings with their references. • finalizing project design references, characteristics, context, and style. • Write final Story statement |
| 7 | Schematic design development | ✓ | ✗ | <ul style="list-style-type: none"> • Story reconstructing, design references, characteristics, context, and style relations • Reflective dialogue, from multiple perspectives on these relations • Create “what if?” questions • Answering “what if?” questions • Best answer is project “concept statement” • Draw a diagram and write down how the concept statement and story statement lead to each other |

| | | | | |
|---|---------------------------|---|---|---|
| | | | | <ul style="list-style-type: none"> • Concept statement final references, characteristics, context, and style relations • Abstract conceptual design using concept references, characteristics, context, and style relations |
| 8 | Approved Schematic design | ✓ | ✓ | <ul style="list-style-type: none"> • Approved conceptual design layout • project final matrix that connect all previous matrixes accordingly to its concept statement • Project final program |

CONCLUSION AND RECOMMENDATIONS

The existing of a gap between the practice and education realms of architecture in present time as researched by previous scholars, this problem may connect to some shortcoming in the learning of design skills in design studio environments in higher education faculties. Overcoming these difficulties has be addressed in many researches and discussion suggesting different solutions and learning theories and application. this dissertation is a contribution to the many attempts to finding way of improvement in design studio classes.

Improving design studio classes required to dig deeper into the problems causes rather than just mentioning the obvious symptoms. Therefore, the start is in investigating learning in higher education system pointing out the cultural and practical aspects of it. Then, going deeper and explored these aspects within the architecture education system. Although architectural education involves too many topics and sectors, the research focus is the design skills that students learns in design studio classes and carry out with them when they graduate and work in practices. When these skills get along with both the process and culture in coherent relation, we produce a student with good design skills.

Based on previous researches and studies related to learning improvements, the space in which students learn these skills plays a great role in the quality and outcomes of their learning. In this regard, I narrowed down the focus to research more about the design studio learning environment. Design studio as a structure is unique in its learning

environment. This uniqueness makes design studio an entity of its own which has its guidelines ruled from within its institution.

Although design studio as a learning environment is unique in its characteristics unlike other educational spaces where learning is one way, it has its own shortcomings and problems that need to be addressed. In this research the researcher explored as many shortcomings as she could; the final list of shortcomings according the researcher are:

- The disconnection and confusion in design process between academia and Practice
- Lack of project brief understanding creates premature problem solving
- Difficulty of representations of the Project: student architectural language blocks development
- Student design culture challenges the design process
- Teacher design cultures challenges student creativity
- Design studio thrives fashion and individualism
- Teaching/ learning time in design studio is relevantly short
- Traditional teaching in design studio produces dependent students

These shortcomings are symptoms of existing challenges of learning design skills in design studios, it can be summarized into three major points: (1) The isolation between architectural education in design studio and architectural practice, (2) The limited understanding of design process as a functional need rather than creative

problem solving and (3) The lack of design decision skills independency in design studios.

the difference of what design skills students learn in schools and what they need after graduation is a problem that will keep surfacing because of the isolations between architectural education in design studio and the professional practice everyday development. Architecture students in design studio sometime are isolated from project context or culture. The solution goal is to break this isolation between knowing what and knowing how. although in the beginning on learning design being isolated can be a positive factor to encourage students to be more creative, but in the advanced years, students should learn to connect with the real world to learn how to deal with regulation, rules, user, clients ...est.

the second challenge is regarding design process approach. Some academic schools teach students to approach the design process only from specific point of view which is to fulfil the functional need. In the other hand, we have the opposite of these schools were design process is an artistic manifesto of the designer without any consideration if design output works or not. The solution is uniting of creativity and problem solving together and to define design process as a creative problem-solving process.

The last goal is to create an independent designer in design classes, because the third challenge is regarding students in design classes tending to depend on their teachers for design solutions or solving problems; in the other hand, some teachers may

force their design preferences on their students. Therefore, students should learn how to take design decisions and build confidence in them self.

After summarizing the challenges of learning design skills in design studios in design studio environment, suggestions of ways to overcoming these challenging. Many of these ways encouraged me to learn more about current learning theories where I first introduce experiential and reflective learning models as a key to overcoming these problems in design studio. The researcher built a background about reflection and experience learning theory and its strategy and the application features students may gain from using it in design studio learning process. Then, proposes storytelling as an alternative learning tool as endorsed by many scholars.

Storytelling is elaborated to the maximum, not only the definitions and characteristics of applying storytelling but also to explore the usages can this tool achieve on many levels in design studio classes preparing the research to be fully supported by previous studies and researches. Understanding storytelling as a learning tool in education and its positive effects on students learning in other faculties encourages research direction to use it as an alternative learning theory in design classes to improve design skill learning and to overcome the aforementioned challenges.

Implementing storytelling in design studio learning can be achieved in two ways; The first way as a reflection and experience learning environment strategies, were the interaction between the tutor and architecture students in the class takes the roles of teller/ listener to transition knowledge and ideas between them. And students to play

the role of the teller to reflect on their experiences that is related to design task to achieve deeper level of learning by achieving emotional connection.

The other way is to apply storytelling in design studio as a step within design process; after site visit and data collection and before concept statement. Students can learn concept finding or creating by applying the five steps of storytelling, this help them to understand better their concepts merits to be able to make better design decisions regarding their projects and to be independent by donning so.

Referring to the case study findings and results, an improvement can be seen in students design skills and their learning, they become more aware of the importance of connecting with their surroundings and project environment, to use these connections to create concepts and designs which are unique by relating the project matrix like social and cultural context, clients or users' requests, regulation...etc. with their experiences and stories. to find unique design concepts, students by using storytelling understood the importance of moving from one phase to other in order, especially the initials phase which conclude data collection, site visiting, project programming and research to avoid jumping into conclusion. Another skill improved by using storytelling is transitioning these information and decision throughout the design process. By doing so, they became more independent in their design decisions and more confident about it, the role of the teacher was to supervise more than interfering.

Although this study was conducted in one university, it is hoped to be part of a continuous journey that will contribute to the development and improvement of education in architecture not only in this institution, but also in other universities as

well as other faculties. I hope this research will build a model study for other scholars to adopt and to lead more researches in the future. Many architectural institutions are eager to conduct similar studies where students are examined directly and researcher qualitatively on the topic of design studio improvement.

The researcher suggests the experiment to be (1) conducted in other universities, modification of how to apply the technique can be done accordingly to its needs and conditions, (2) research to be done in other design related sectors like interior design , and (3) a third party to cross examines the results. The researcher also recommends that this research to be applied to earlier design studio classes. The more experiments to be conducted, the better the results are to be confirmed.

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APPENDIX

