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AIM

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Editorial

İlgi Toprak

Independent Researcher (PhD), Co-editor of Journal of Design Studio, Washington DC, USA

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ORCID: 0000-0002-3952-8887
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Editorial

Welcome to the second issue of the third volume of the Journal of Design Studio. There are seven research and one design studio case article in this issue of the Journal of Design Studio.

The first article of this issue has the title “Hapticity in Digital Education Atmosphere” and was written by Esen Gokce Ozdamar, Gokcen Firdevs Yucel Caymaz, Hulya Yavas. It focuses on the effects of reduced tactile perception in distance education for all actors in architectural design studios during the ongoing Covid-19 pandemic. The research of the article is based on interviews with students. In these interviews, tactile perception observed construction techniques, factors affecting design materials, the way and place of perception of materials, methods of sharing and transferring designs with studio instructors, questions and expectations about the obstacles encountered were examined.

The second article has been written by Ugur Tuztasi and Pınar Koc, which was entitled “A Design Task for Sivas Grand Mosque’s Minaret: Vertical Construction/Formal Articulation/Visual Stimuli”. The main aim of the study has been defined as exploring creative methods to design a vertical structure through visual reasoning. The expected result from the dialogue used as a methodological approach in the article was the abstraction of the minaret, which is a pure form, and then the development of a design proposal for its existing structural problems. When the structural component under consideration is interpreted as a pure form and the level of abstraction is increased with visual reasoning, it has been determined that the results increasingly include approaches close to experimental applications.

Rahman Tafahomi, is the author of the third article which is entitled as “An Attempt to Fill the Gap between the Architectural Studies and Conceptualization in Architectural Thesis Design Studio”. The article aims to evaluate the application of a theoretical framework in an architectural graduation project to explore the effectiveness of the application. A theoretical framework model was tested to assess the effects on students' learning outcomes. The methodology of the research was designed based on structured observation and content analysis, and its findings reveal that students perceive and understand the studies and theoretical framework differently. As a result, the researchers concluded that for an effective expectation, detailed guidelines can harmonize students' outputs due to the diversity of application, interpretation, and representation of architectural theoretical frameworks.

The article which is entitled “Using a Brand Identity-Focused Project Structure to Improve the Competencies of Product Design Students” had been written by Bulent Unal, H. Merve Demirci, Emrah Demirhan. The article deals with a study in which brand identity-oriented product design was restructured. The study is aimed to gain brand identity and product identity analysis skills along with design skills in the industrial design studio. Data obtained from semi-structured interviews and participant observations were analyzed using an inductive coding approach. The results show that the applied methods lead students to research, think, question, understand, and grasp the importance of knowledge.

Rahman Tafahomi and Reihaneh Nadi, are the authors of the article which was focused on graphical features in the mapping of SWOT studies in the architectural design studio. The title of this article is "The Interpretation of Graphical Features Applied to Mapping SWOT by the Architecture Students in the Design Studio". The main purpose of the article is to explore the learning outcomes in architectural education of the application of graphical features in the mapping process of SWOT. SWOT (Strengths, Weaknesses, Opportunities, and Threats) contains deficiencies that must be implemented in the design studio for a mapping process due to non-graphical foundations. The article developed suggestions for this and the results showed that students applied point, line, polygon, symbol, tone, and color in their mapping processes. The research outputs showed that students applied scale to produce SWOTMAP, sketching, drawing, and mapping to correlate location and graphic data.

"The Instrumentalization of Fictional Narrative in Relation to Architecture-Urban Environment: The Example of "Laughable Places" Workshop" by Merve Eflatun argued in this article, how the relationship between the city and architecture is handled in the field of literature. With the "Smiling Places" workshop, the relationship between literature and architecture and the revealing of their potentials are discussed with their imaginary, representational, and textual dimensions. They were grouped using fictional narration based on literary works in workshop setups or fictional narratives written by the participants.

The article is entitled "*Zobo* Tea Package Design Prototype Allied with Product Onomastics" by Ayorinde S. Oluyemi, E. Bankole Oladumiye, and Oluwafemi S. Adelabu. The study aims to create a zobo tea package design prototype allied with African indigenous onomastics. The study focuses on domestic zobo tea in terms of creating a conceptual packaging design prototype developed with product onomastics. Numerous names and designs have been derived for the native zobo tea, utilizing linguistic techniques. A Delphi technique was adopted to evaluate the process and the results show that synonym onomastics will increase the branding and development of domestic zobo tea even in the international market.

Design Studio Cases section contains the article written by Derya Adiguzel Ozbek, which was entitled "Dialogical Structure Experience in Basic Design Studio at Online Education". The article deals with the structure of the basic design studio, which begins with face-to-face training and ends with online training, based on Bakhtin's dialogic concept. In the transition from face-to-face education to online education, the effects of the studio space, studio process, and studio content and the effects of the combination of these components are provided with a flexible structure instead of a definite transition.

A special issue on "Landscape Research" is now accepting full articles until the 1st of February 2022. We are happy to invite you to submit a paper for the Journal of Design Studio for a special issue "Landscape Research". Both Research and Review papers are welcome for possible publication in this issue. For this special issue, guest editors Dr. Beyza Şat, Dr. Kaan Özgün, and Dr. Dinemis Aman are seeking research or review manuscripts that extend the framework of landscape design, landscape ecology, and landscape analysis as the main heading. For consideration for inclusion in this special issue, manuscripts must be submitted by February 1, 2022, through the usual JDS electronic submission process: https://dergipark.org.tr/en/login Please indicate special issue "Landscape Research" and Editor name while submitting.

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Hapticity in Digital Education Atmosphere

Esen Gokce Ozdamar
Department of Architecture, Tekirdağ Namık Kemal University (TNKU), Tekirdag, Turkey
Gokcen Firdevs Yucel Caymaz
Department of Architecture, Istanbul Aydın University (IAU), Istanbul, Turkey
Hulya Yavas
Department of Architecture, Istanbul Aydın University (IAU), Istanbul, Turkey

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E. G. Ozdamar ORCID: 0000-0001-7189-3633, G. F. Yucel Caymaz ORCID: 0000-0002-0012-8384, H. Yavas ORCID: 0000-0002-8153-2118
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Abstract: This article focuses on the effects of the decreased ability to perceive touch in distance learning for all of the actors in architectural design studios during the ongoing Covid-19 pandemic. As part of face-to-face architectural pedagogy, the tactile experience of architectural materials, models, and corporeality in the studio environment assumes great importance. However, in contrast, these aspects are diminished when it comes to digital education, generating new topics for discussion. This article asks how and to what extent distance education models can affect the process of learning, understanding, discussing, and designing architecture, amidst the prospect of continuous digital education in the post-pandemic period. Hence, it examines the awareness and experiences of haptic perception of first-year students at the Istanbul Aydın University Department of Architecture through in-depth interviews recorded on Zoom. Between 2020 and 2021, the interviews investigated haptic perception, observed construction techniques, factors affecting design materials, the way and place in which materials were perceived, the methods of sharing and transferring designs with studio instructors, questions about the obstacles encountered, and expectations for the post-pandemic period. The outcomes of these in-depth interviews showed that there is a close relationship between the students' bodily interests and their awareness with regards to perceiving materials and that the former indicated a tendency towards making models. It was observed that students had preferred digital design tools in the pre-pandemic period, and in addition to the digital tools that students often use as a design approach, they negotiated as designing through hand-drawing in order to gain the "thinking with one's hands" experience in this study. This emphasizes the need for haptic experiences in an architectural educational environment.

Keywords: Architectural design studio environment, digital environment, distance learning, haptic learning in distance education, multi-modal perception, material perception.

1.Introduction

Following the outbreak of the Covid-19 pandemic, one of the difficulties of distance learning in architecture is the issues caused by the decreased interdisciplinary interaction and dialogue between instructors and their students. As Salama and Crosbie mention (2020) some of the emerging challenges and online restrictions that the students may face include "access to software from off-campus sites along with high-speed broadband or specialist computers for modeling and visualization". Indeed, the most common disadvantages when compared with face-to-face learning are the communication problems faced by students, which may cause the instructors to "use multiple applications" (Ibrahim, Attia, Bataineh, and Ali, 2020, p. 1).

Other restrictions and challenges faced by the students and instructors who live in non-university households include experiencing power outages during the pedagogical process, lacking access to architectural models and materials (which often corresponds to the remote location of their residences), and the decrease in hapticity as part of a distance—the focus of this article. Other challenges that may arise are the restrictions or suppressive factors such as personal worries or self-censorship in some politically-related architectural discussions, and consequently, the students' concerns that they may be faced by both the instructors and students in different contexts due to the recording and inspection of the courses.

In contrast to all of these challenges, there are some advantages to distance learning, such as "openness, flexibility, volume, and accessibility" with regard to "open educational tools and courses, educational methods or management approach educational services, and time" and the fact that it "does not contend with the restrictions of time, place and educational tools" (Ibrahim, Attia, Bataineh, and Ali, 2020, p. 1). In addition, it is significant that the lessons can be viewed and downloaded again—allowing students to watch the lesson at an accelerated or slowed-down speed—depending on their perception and speed—and to gain transparent and open-access opportunities.

In addition to these challenges and advantages, another important issue is the relatively limited effect of student-instructor interactions and the production practices of architectural design studios that are realized collectively. At this point, some potential fundamental problems with the students' perceptive abilities may arise. The fact that a digital screen does not activate our haptic sense, or appears invisible in contrast to more easily perceivable visual layers—such as images, sound, and motion—appears to be an important problem. What kind of possible problems can arise out of the simultaneous co-existence of all the senses in digital architectural studio environments? In distance learning, it is observed that haptic skills and the experiences of the students in learning and comprehending design are restricted.

Based on both the decreased and restricted haptic practices and experiences of design and architecture that students have undergone through distance learning during the Covid-19 pandemic in Turkey, this article addresses how a gradually decreasing haptic experience can shape students' architectural education and their perspectives on architecture in the future. As such, the article aims to paint an understanding of how multidimensional haptic learning in architecture can provide both models/model-making and sensory experiences with physical contact, given the possibility that distance learning models will become more prevalent in the future.

1.1. Distance Learning in Architecture

Distance learning, which derives from the early applications of correspondence education, has come to be deployed worldwide through print-based materials and various technologies, and has started to develop on a national and international scale since the 1980s. The aim of distance learning is to "offer degree-granting programs, to battle illiteracy in developing countries, to provide training opportunities for economic growth, and to offer curriculum enrichment in non-traditional educational settings" (Gunawardena and McIsaac, 2004, p. 356).

As Riel (1993, cited in Gunawardena and McIsaac, 2004, p. 356) has stated, previously, in distance learning that contained collaborative features, students from different parts of the world participated in cooperative learning activities by sharing information over computer networks. "Global classrooms," which featured different participants from different countries interacting with each other from a distance, were also "collaborative, authentic, situated learning activities" (Gunawardena and McIsaac, 2004, p. 356). Thanks to the existing web-based multimedia and information technologies at our disposal, such programs have created unity by eliminating the boundaries of "time and place"

for distance learning (Gunawardena and McIsaac, 2004, p. 356).

In architecture schools, and especially in design studios, face-to-face education and distance education practices and environments where studio instructors and students can work independently and remotely have been maintained for the last twenty years (Masdéu and Fuses, 2017, p. 11). The University of Universities (UOU) Project, which emerged before the pandemic for Erasmus exchange students, can be cited as an example of such an ongoing online education program, providing in-studio training under the direction of Javier Sánchez Merina and Joaquín Alvado Bañón. During the pandemic, interviews supported by various collective workshops and weekly online meetings were held to bring international students together and increase studio collectivity. This has helped to expand the physical boundaries of universities and the classroom by bringing together international students and guest lecturers from around the world with different research interests (URL-1, 2020).

Distance learning has both positive and negative pedagogical aspects, both in the pre-pandemic phase and during the pandemic proper. Firstly, architecture and design by their very nature are collaborative, conducted within dynamic atmospheres in which there is a mutual knowledge and transferal of experience from the instructors to the students and between the students themselves as well. Physical experience—observing and feeling the real-life boundaries of studio spaces and the hands-on ways of engaging with and learning about architecture both in and out of the studio—is important for a student. Secondly, grasping the studio environment or physical sites collectively through physical touch—whether it is on an open field, in an urban context, or inside a building—enables students to perceive and observe the dynamics of those spaces through their own bodily occupation of the latter.

Much research has been conducted during the pandemic with regard to the latter's implication on architectural education. According to a cross-sectional survey conducted by Koh and Khuan Wong (2021) with 716 design, architecture, and engineering students, "the perception of online learning and its institution's engagement" during the pandemic has shown that "the pandemic has a minor effect on their university plan, where 84% are keen to re-enroll for the term and only 6% prefer to wait out the pandemic". Additionally, there is a challenge in fulfilling the educational needs of design and architecture students (Koh and Khuan Wong, 2021, p. 636). However, contrary to Koh and Khuan Wong's argument, the education within an architectural studio in particular entails a pedagogical and experiential process that is developed together by both the student and instructor—and this does not depend on a strict learning-based axis. The discovery of ambiguous and tacit knowledge by the architect is also very important in these mutually-evolving models of cognition. Another piece of research focusing on emergency remote teaching (ERT) and its effects on architectural education in the "pre-pandemic, during the pandemic and post-pandemic stages" in Oman has shown that the "rate of interaction between student-teacher" in synchronous and asynchronous remote teaching was observed to have been reduced during the pandemic (Kauser, 2021, pp. 89-90). That said, despite the quick adaptation to the emergency situation by teachers and students, the online atmosphere's pedagogical effectiveness has been reduced, as there is a diverse set of students with diverse responses and needs (Kauser, 2021, pp. 89-90).

However, most of these studies do not refer much to the perception of architecture through the human body, nor to the ability of first-grade design students to sense both the built environment and materials, as these students are mostly unaware of such sensations and experiences. Therefore, this article focuses on the evaluation of first-grade architecture students. Since the pandemic, not many studies have focused on hapticity in distance learning in the architecture and design educational domain, but considering these remote learning

models—which will become more widespread in the future—it is inevitable that the effects of this model in the fields of architecture and design will be discussed.

1.2. Haptic Perception in Architectural Education

1.2.1. Haptic Perception

Hapticity concerns the sense of touch. As Piaget mentions, haptic perception is developed in the early stages of childhood, with our "tactile-kin[a]esthetic impressions" crystallizing into a "spatial image of a visual kind" (Mallgrave, 2010, p. 188). The ecological psychologist James J. Gibson has asserted that our haptic system transforms information derived from objects into three dimensions (Mallgrave, 2010, p. 188). As Mallgrave explains, hapticity can be used as a "synonym for the emotive and multisensory experience of architecture, which includes the visual dimension" (Mallgrave, 2010, p. 189). Hapticity enables us to learn about surfaces and textures, as well as the sense of touch, alongside the sense of sight. Depending on the hardness, softness, roughness, inclination, or degree of horizontality of a floor, human beings are always considered to be interacting with surfaces while standing and walking. Similarly, the ability to grasp an object's properties such as its weight and surface lies behind our need to touch objects. This perception of space closely affects our spatial qualities as well as our understanding thereof (Altan, 2012, p. 85).

Similarly, Juhani Pallasmaa, in his book *The Eyes of the Skin* mentions that there is a close relationship between the "tactile sense for our experience and understanding of the world" as well as "between the dominant sense of vision and the suppressed sense modality of touch" (Pallasmaa, 2005, p.10). He notes that touch, as a sensory tool, "integrates our experience of the world with that of ourselves", fusing itself together with visual perception (Pallasmaa, 2005, p. 11). Pallasmaa defines hapticity and tactile experience as "multi-sensory"—an experience in which "qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle" (Pallasmaa, 2005, p. 41). He argues that "the sense of sight may incorporate, and even reinforce, other sense modalities; the unconscious tactile ingredient in vision is particularly important and strongly present in historical architecture, but badly neglected in the architecture of our time" (Pallasmaa, 2005, p. 26).

Another issue regarding haptic perception has been raised by psychologist Howard Gardner's approach (1983) to multiple intelligences in his book *Frames of Mind: The Theory of Multiple Intelligences*. In this book, he refers to the "spatial, bodily-kin[a]esthetic, musical, interpersonal, and intrapersonal intelligences" as examples of human cognitive capacities (Gardner, 2011, p. xii). According to Gardner, the body is:

> "more than simply another machine, indistinguishable from the artificial objects of the world. It is also the vessel of the individual's sense of self, his most personal feelings, and aspirations, as well as that entity to which others respond in a special way because of their uniquely human qualities" (Gardner, 2011, p. 249).

Thanks to the work of Pallasmaa and others, the role of the body as an interface in comprehending the world and the spaces around us, as well as our kinaesthetic perceptions and sense for the environment, have begun to be discussed in architecture and compared to other perceptions. Today, the interaction of architecture with human physiology is handled with more depth and more focus on interdisciplinary interaction with other fields such as neuroscience, orthopedics, and cognitive psychology. One of the important concepts and fields of perception in this subject is kinaesthetic perception, which is also related to the haptic sense.

However, kinaesthetic learning is one of the least evaluated issues in architectural design studios. It refers to "experience by doing" through bodily sensation. The term kinaesthetic defines the "spatio-temporal continuity of the urban space" in acquiring real life experience through bodily activities such

as walking and constructing movement (Andjelkovic, 2020, p. 28). In this respect, kinaesthetic perception—in realizing the performative realities and potentials of architectural space—transforms the spaces we live in and offers a differentiating aspect to our approach towards design.

1.2.2. The Role of Hapticity in Architectural Design Studio

In the past, during the Bauhaus period, basic design courses such as the *Vorkurs*; meanwhile, Johannes Itten and Laszlo Moholy-Nagy were also carrying out many experiments in architecture and design education to increase the motor skills and for the activation of the visual, tactile, kinaesthetic senses. These ranged from using the tactile boards of visually-impaired individuals to experiments conducted in space to ribbons and furniture proposed by one of the futurists, F. T. Marinetti, to enhance the tactile senses (Moholy-Nagy, 1947, p. 24). In the wake of the widespread and long-term training methods of the Bauhaus movement, how can we digitalize haptic education models, especially in the future, from a familiar methodology that does not merely reflect a trend or fad of the times, all while stimulating all of the senses?

In his book *The New Vision, Abstract of an Artist*, Moholy-Nagy mentions that

> "a human being is developed by crystallization of the whole of his experience… Instead of extending our realm of action, as the primitive man was forced to do, since he combined in one person hunter, craftsman, builder, and physician, we concern ourselves with a single specific vocation, leaving other capacities unused" (Moholy-Nagy, 1947, p. 14).

In the Bauhaus education, "the powers hidden in each individual originated in a free collective structure. The pattern of a student community was developed by students who learned 'for life, not for school', which meant 'practicing real life'." The first-year education was particularly important to the movement, and therefore, "sensory experiences, toward the enrichment of emotional values and toward the development of thought," gained much importance (Moholy-Nagy, 1947, p. 19). Sensorial training focused on increasing the sense of touch and tactile perception through exercises performed using various materials, tactile tables, and surfaces. The training also included an intense psychological study of the material with the help of tactile tables, and exercises such as surface treatments played an important role as well (Moholy-Nagy, 1947, p. 23).

As for Lakoff and Johnson, the studies are related to "embodied interaction"—in which the environment, mind, and body operate together due to the neural mechanism through which sensorial and movement-based experiences intertwine (Nanda and Solovyova, 2005, p. 155). Similarly, the act of touch, haptic experience, and the "sensations, influence, materiality and mental associations" associated with it appear not as abstract concepts, but as ideas that can be utilized in architectural design processes when we regain awareness of their complex functionalities (Öktem Erkartal and Ökem, 2015, p. 92).

In today's architectural design studios, computers play an important role both in the design conceptualization phase and in the design development, from design to modeling to animations. Architects transform their thoughts, sketches, freehand sketches, technical drawings, models, texts, and data into a design of a building and its environment. As Sheil explains, "among the host of critical and diverse traits required in architectural production, the making of buildings demands an expertise that is familiar with the tactile and the physical" (Sheil, 2005, p. 6). However, as Pallasmaa argues, "computer imaging tends to flatten our magnificent, multi-sensory, simultaneous and synchronic capacities of imagination by turning the design process into a passive visual manipulation, a retinal journey" (Pallasmaa, 2005, p. 12). Pallasmaa's definition allows us to rethink our practices within studio settings: can architecture students, especially freshmen, develop spatial-

bodily, kinaesthetic intelligence through physicality—and mainly, through their hands?
For Pallasmaa, the design process, as a "mental transfer" from the representations of drawings to the physical and material reality of the project idea and "the images with which the designer advances are not mere visual renderings; they constitute a fully haptic and multi-sensory reality of imagination" (Pallasmaa, 2009, p. 59). Model-making enables an architecture student to design, think, perceive and understand the different layers of a design problem, such as scaling and mapping, by testing the invisible data observed in a field into visible potential by testing their ideas. In other words, the architectural model as a tool enables "understand[ing], defin[ing] and measur[ing] various issues" (Smith, 2004, p. xxi).

On the other hand, simulations play an important role in increasing design-oriented thinking and the designer's ability to understand reality (Sorvig, 2005, p. 98), while on-screen methods have the advantage of showing students how buildings are constructed more easily and are more affordable compared to field trips (Sorvig, 2005, p. 104). However, perceiving reality as a presentation cannot provide a real sense of feel due to the barriers between the screen and the perceiver. While hand-drawn sketches and designs can provide a faster and more flexible approach to creativity, using electronic simulations as a design tool provides a slower and "more analytical frame of mind, which can stiffen and abstract the designer's thinking at a point when flexibility and embodiment is called for" (Sorvig, 2005, p. 98). Spiridonidis and Voyatzaki have drawn attention to the important fact that an architectural education largely depends on "proven," "tested," "predictable," "rational," and "confirmed" value systems; as such, many architectural institutions are highly "skeptical" of and "often resistant [to] the new, the unknown, the changing"—an attitude that has persisted over the past fifty years (Spiridonidis and Voyatzaki, 2010, p. 15).

2. Material and Methods

2.1. Research Problems

This study explores the problem that haptic learning styles risk drifting away from the holistic nature of architecture because haptic perception is less accessible to both students and instructors in distance learning. If distance education models become more widespread in the future, to what extent will this perception be affected when making models and learning about, understanding, and discussing architecture? One of the most fundamental disadvantages of the pandemic with regard to the architectural discipline is that the activity of design creates an important interface for exploring the human body when capturing ambiguous information through architecture—such as observation, touch, perception, or ambulation. In this context, if these educational models continue over the long term in the future, how the distance education model will shape both the intellectual as well as applied practices of physicality, haptic learning, and discovery in architecture becomes an important problem that warrants discussion.

2.2. Methods and Research Questions

To address these problems that have arisen in distance education during the pandemic—and which may indeed continue in the post-pandemic future—the perceptions of first-year students at Istanbul Aydın University's Department of Architecture on this topic were registered through in-depth interviews recorded via Zoom.

Unlike face-to-face education—where one's body and limbs can move—distance education has increased the workload of instructors, as architectural studio hours are conducted by sitting in front of the screen for a long time. Beyond the students' experiences, the pandemic has also had consequences on architecture instructors' usual channels of imparting knowledge. This can cause not only mental stress and fatigue but also various physical health impairments, especially in situations where vision, hearing, and hands are used extensively. In other words, distance education may result in inadequate

communication or an inability to communicate effectively in an online architectural studio, as it restricts bodily mobility. For this purpose, the authors of this study, who did not meet face-to-face before the research process, also had the opportunity to meet for the first time over Zoom. However, to minimize the loss of time by writing out all of the discussions by hand, voice-conversion applications on mobile phones and Google Drive, for example, were used to convert their meetings and interviews to text. Since this method requires less hand-work, it has proved convenient in writing the article.

In the interviews, meanwhile, nine questions were asked to investigate the haptic perceptions of the students. These questions were mainly designed to examine students' understanding of experiencing materiality, to articulate the difficulties they observed in doing so in their virtual studio time during the pandemic, and to understand how effectively students use their hands and bodies. Since the students did not yet have a wide perspective in comprehending the holistic nature of architecture, they tried to comprehend materials with which they came into direct physical contact. At the same time, sports, crafts, and other activities which increase the haptic experiences of the students have also been recorded.

Students' relationships with the materials were based on the context of "material encounter" and "material engagement" proposed by Karana et al and based on Henri Focillon (1992) and John Dewey (1980) (Karana et al., 2015, p. 38). The foundations of this approach were actually laid in the Bauhaus period, with the approaches of Bauhaus instructors such as Itten and Moholy-Nagy, which stressed the role and value of sensory encounters and the importance of "hands-on manipulation in material understanding" (Karana et al., 2015, p. 38).

2.3. Participants and the Study Setting

At Istanbul Aydın University, which has a four-year architecture degree, students in the first year of their architectural education take the following courses: "Introduction to Architectural Design I-II", "Fundamentals of Visual Design", and "Communication Media I-II". They also take "Fundamentals of Architectural Design I-II" and "Construction Technology I-II". During the pandemic, students attended face-to-face courses in the department, where the number of people and the duration of the lessons were adapted within the framework of the "hybrid education" model in both periods. Of these courses, the "Introduction to Architectural Design I-II" studio course, which had been required eight hours a week before the pandemic, was reduced to four hours a week over Zoom after the outbreak of Covid-19. The content of the course includes the form, characteristics, and transformation methods as well as the horizontal and vertical elements that define space; it also explores the openings within these elements concerning the relationship between form and space, spatial organizations, and principles of spatial arrangement. Within the scope of "Introduction to Architectural Design I-II," students design a three-story housing project—which includes the lower, upper, side shells, and structural elements of the architectural structure—under the supervision of the group instructor throughout the semester. Secondly, they also design projects by producing original architectural programs on selected subjects from certain fields, such as science, arts, sports, etc.

To understand how distance education has affected architectural students, in-depth interviews were conducted during the second semester with a total of 20 randomly chosen first-year students (out of a total of 41 in the program) aged between 18-24. 50% of the students were female and 50% were male. First-year architecture students who participated in the in-depth interviews on the courses determined by the appointment system (within the scope of their hybrid education) attended practical lessons in groups of three with their instructors. In the first semester, face-to-face classes were held for the first six weeks by appointment, while the following nine weeks entailed distance learning. In the second semester, the students continued their

online education for the first three weeks, a face-to-face education for two weeks, and then online courses again for the remainder of the semester. The students answered the questions based on their distance education experiences in both semesters. Students were contacted by phone and invited to participate in the in-depth interviews online through Zoom. Interviews with the students were made in 20-40-minute time intervals and the interviews took place over two complete days within a one-week interval.

3. Research Results

In the past, based on the Bauhaus pedagogy and the observations of Merleau-Ponty and Pallasmaa on how design triggers haptic and sensorial perceptions, questions in the interviews were asked based on students' material experiences. This research managed to determine that all of the students participating in the interviews live in urbanized areas and that 85% of them have experienced the construction of at least some kind of building. In the buildings designed by the students, when reflecting upon both semesters in their architectural education before the formation of their theoretical foundations, the "place of experienced materials" was determined as the dominant factor, at 60%. Students were asked about the way in which they perceive the space through the materials, and by seeing (optical) the materials, they all suggested that their designs before and during the process entailed 85% touching, 5% tasting, 40% smell, 30% hearing, 35% bodily sensation (kinaesthetic), while 5% experienced the materials physically. 80% of the students have used these materials in their construction sites, while 45% have seen them in a construction store, 10% as a display product in a construction fair or a material exhibition, 35% through the studio instructor. 70% have encountered the materials in their living environment, while 70% have also seen the representation of the material in two dimensions (in the form of a plan, section,

elevation, or perspective) in printed or digital media (books, magazines, building catalogs, brochures, etc.). 30% have seen an image of the material but only its technical properties (size, thickness, etc.) in printed or digital media, while 45% have seen a representation of the material through animations, videos, or documentaries on the internet. The ratio of people engaged in sports and art activities as non-architectural activities is high (40%); 80% of those had seen the construction technique of reinforced concrete structures. Meanwhile, the perception of materials using only the optic senses is low (10%), 40% have experienced the materials in the home environment and the printed or digital environment, while 35% have done likewise through their studio instructor and printed or digital media (35%). The percentage of those who work in the studio by sketching using their hands or a digital pen and with various drawing or design programs on the computer (or using other digital tools) is high (40%). Issues related to educational obstacles include time efficiency, a failure to experience the design process with the coordinator, and communication problems with the instructor (40%). It has been determined that during the pandemic period, 85% of students would prefer to work with a pen on paper or through hand drawing as well as design in computer-based digital environments as such design methods enable them to see their education as hybrid or prepare them for a completely digital future (Table 1).

Table 1. *Data and evaluation of answers of participants*

	Frequency	**(%)**
Interests		
None	2	10
Sports only (football, basketball, fitness, boxing)	3	15
Sports and handcrafts	1	5
Drawing	3	15
Art only	3	15
Sports and art	8	40
Observed Construction Techniques		
Industrialized Techniques (Reinforced Concrete)	16	80
Industrialized Techniques (Steel Construction)	2	10
Industrialized Techniques + Masonry	1	5
None	1	5
Factors affecting students' design material selection in architectural studio		
Experiencing material face-to-face + its technical features	7	35
Architectural studio environment + researching material in catalogs/digital environments	6	30
Architectural studio environment only	7	35
Perceiving materials		
Optic only	2	10
Optic + haptic	8	40
Optic + haptic + taste + olfactory + auditory	10	50
Place of experienced materials		
Construction Environment (Construction site + Construction market/ fair)	3	15
Non-face-to-face (Representation in a printed/digital media)	2	10
Home environment + Non-face-to-face (Representation in a printed/digital media)	8	40
Home environment + Instructor of the studio + Non-face-to-face (Representation in a printed/digital media)	7	35
Methods for sharing students' design with studio instructor		
Free-Hand drawing/ taking photos/ scanning + Developing design with digital tools + designing with digital tools	2	10

Free-Hand drawing/ taking photos/ scanning + Free-Hand drawing/ developing design with digital tools + designing with digital tools	5	25
Free-Hand Drawing with/without digital pen and developing design with digital tools	8	40
Free-Hand drawing/ taking photos/ scanning + Free-Hand Drawing with/without digital pen and developing design with digital tools + Developing design with digital tools	5	25
Educational/Communicational obstacles in architectural design studio during pandemics		
Technological problems (Communicational problems)	1	5
Access to model making materials	2	10
Design efficiency in digital environment (time inefficiency, communication problems with instructor)	8	40
Decreased interaction (communication problems with classmates, inability to expression of the students)	7	35
None	2	10
Future expectations for the students in architectural design studio		
Hand drawing/design + physical model	1	5
Design/Modelling with digital tools	2	10
Hand drawing/design + design with digital tools	17	85
Model making		
None	1	5
Design with digital tools only	5	25
Physical model only	6	30
Design with digital tools + Physical model	2	10
3D printer	4	20
Design with digital tools + 3D printer	1	5
Physical model + Design with digital tools + 3D printer	1	5

The technological and online environment of those who do not have original features other than studying architecture is as follows: only those who do sports or are engaged in handcrafts lacked access to materials and interaction; those who draw lacked online educational experience; when only concerning the online environment, those who are interested in art demonstrated a low interaction rate. Hence, it has been determined that those who work with sports and arts have problems with the online environment and a lack of interaction. It was seen that the students who stated that there was no difference in education before and after the pandemic were among those who only deal with art, sports, and sports as well as art (Table 2).

Table 2. *Interests and educational/ communicational obstacles in the architectural design studio during the pandemic*

Interests	Technological problems (communicational problems)	Access to materials	Design efficiency in digital environment (time inefficiency, communication problems with instructor)	Decreased interaction (communication problems with classmates, inability to expression of the students)	None
None	1	0	1	0	0
Sports only	0	1	0	2	0
Sports and crafts	0	1	0	0	0
Drawing	0	0	3	0	0
Art only	0	0	2	1	2
Sports, music and performing art	0	0	2	4	2
P=0.042<0.05 significance level					

A close relationship has been found between "observed construction techniques and perceiving materials". It has been found out that students have more commonly experienced reinforced concrete and steel—industrial construction techniques where the hand is used less than observed construction techniques—than traditional masonry systems, since all of the students noted that they live in urbanized cities. The ways in which students can perceive these production processes and materials were determined as optic, haptic, gustatory, olfactory, and auditory, respectively (Table 3).

Table 3. *Observed Construction Techniques and Perceiving materials*

Observed Construction Techniques	**Optic only**	**Optic + haptic**	**Optic + haptic + taste + olfactory + auditory**
Industrialized Techniques (Reinforced Concrete)	1	7	8
Industrialized Techniques (Steel Construction)	0	0	2
Industrialized Techniques + Masonry	0	1	0
None	1	0	0
P=0.047<0.05 significance level			

Those who saw the reinforced concrete skeleton construction did not model digitally or make models with 3D printers, but they did use all other techniques. Meanwhile, those who saw the construction of the reinforced concrete and steel skeleton made only physical models. It was determined that those who saw reinforced concrete and steel and masonry construction had conducted some digital modeling using a 3D printer.

4. Discussion

The most common problems experienced by the students in the architectural design studio during the pandemic period are design efficiency in the digital environment, decreased interaction, the inability to express themselves, the inability to observe other students' designs in an online or hybrid context, the lack of access to model-making materials, and technological or communicational problems. During the interviews, it was revealed that students' preferences and opportunities to meet with other students outside the studio to exchange ideas emerged as an important issue. This situation created a disadvantage for the students to discuss and practice their ideas collectively in the studio environment.

Based on the research data, the approach of gaining a better understanding of the materials through touch—which is lost in contemporary digitalized architectural practices—is slightly decreasing. In the in-depth interviews, it was revealed that the students mostly prefer to design and draw in a computer environment, which is also very common in the face-to-face education environment. Similarly, in the applications performed with students in architectural design studios, students who do not partake in a hobby, handicraft, or bodily-engaging activity such as sports or dance demonstrated less interest in making models by hand and sketching with a pencil or digital pen. Even though the relationships between the students' interests were not deemed significant according to the study's statistical data, the students who display an interest and/or engage in the aforementioned fields of sport, music, or performance arts placed more importance on the haptic senses in their architectural design

studio courses. It was also revealed that the visual was more predominant than the haptic (or other senses) in the students' perception of the built environment, and that they lacked knowledge about, experience with, and an awareness of the other senses (Table 3). This situation emphasizes the holistic approach of sensory experimentation—widely used in Bauhaus education—and the need for developing transformative design environments through today's developing technologies and perspectives. Another issue in distance education is the limited opportunity for transfer between students of their respective haptic experiences. In this context, forms of architectural representation may mask the acquisition of knowledge and experience when touching nature and sensing the environment. It was determined that students who had experienced industrial techniques thought to use other techniques than designing with digital tools or 3D printers in the architectural studio course. Meanwhile, students who had not witnessed any production technique prefer to physically produce firstly using 3D printers, and thereafter, with digital tools and physical models, depending on their need to see and touch their designs in 3D.

In relation to the variety of construction techniques that the students had witnessed, a tendency to prefer 3D physical productions has been observed among the design and modeling methods that they are likely to prefer in future architectural studio courses. Additionally, the students predominantly prefer to continue their development using free-hand drawing and digital tools. The study showed that they have chosen to continue the design methods that were predominantly being used before the pandemic at the university. Similarly, this situation overlaps with the way in which students design in the studio environment and share with the executive during the pandemic period. Figure 1 shows the key concepts that the students verbally identified and are likely to prefer in their future studio environments.

As seen in Figure 1, some such concepts include: "free-hand design efficiency", "experiencing free-hand design pleasure", "design genuineness on paper", "free from digital constraints", "self-reliance provided by model-making", "thinking with hands", "courage to sense with touch", "rapidity in the design process", "comprehending scale in design", "providing different perspectives in the digital atmosphere", "restrictions to flexibility in a digital design atmosphere."

Figure 1. *Emerging concepts in the preferences of students in architectural studio environments for the post-pandemic period*

In "factors affecting students' design material selection" in the studio, the students preferred materials that they had seen and experienced before in their designs; this also held true when researching their technical properties—that is, they mainly preferred materials whose physical and technical features they had seen. The latter they had either witnessed in the architectural studio or had selected based on the information conveyed to them by the director. The students' choice after seeing a representation of the material was relatively less influential in their decisions.

It is evident that in the "place of experienced materials", students have seen representations of the materials in print or digital media or have experienced and found them in environments such as their home and neighborhood. However, at this point, it was not observed that students take an experimental approach to discover or design new materials that have not yet been produced or observed. Consequently, one can conclude that construction sites and building fairs—in addition to the studio environment—are important in increasing haptic experimentation in terms of both the selection of existing materials and the production of new ones. In this way, the haptic experience that students will gain by encountering different materials will be able to develop their holistic design perspective.

It could be claimed that this increases the ability of the student to increase their creativity and transforms the possibilities available through traditional design methods; however, on the other hand, the ability to think with one's hands has been limited in the digital environment and for architectural students who can make model models or robotic designs on very limited scales. It can be argued that designing productions using digital representations creates some experiential weaknesses in understanding the hapticity of materials.

The visual documentation and representation of a design—increased by digital communication —will cause the role of haptic elements in the design to transform from an instructive or imaginative and contemplative state to an interior element of the design itself. The disappearance of the physical or haptic properties of the material will trigger a different perception. For example, in a situation where computer keyboards are eliminated and instead reflected on the table with infrared rays, drawing on the table or space may fulfill our desire to physically touch it while designing without a computer, keyboard, or mouse. Working with infrared or touchscreens can be restrictive for the experienced designer and risks confusing the brain's multi-faceted activities. When this is considered inevitable, it is obvious that we need new paradigms. In fact, the digital world is already an inseparable, indispensable interface for the architectural education of today.

These approaches—whether kinaesthetic or relating to spatial perception—are experienced by students who are relatively more advanced on an individual level; indeed, it can be said that they provide benefits for students who are far from the directives or help of a guide, and, on the other hand, who can independently pose problems and develop solutions to them. However, it can be argued that distance education may not yield the same expressions and results in an architectural environment. It would not be wrong to say that the internal dynamics of an education in design would be negatively affected should digital education methods become more widespread in the future.

Haptic Perception in Distance Education

As Coffield, Moseley, Hall, and Ecclestone (2004, cited in Hamza-Lup and Stanescu, 2010, p. 79) have noted, considering that about 15% of the population learns kinaesthetically, this latter group has difficulties in trying to grasp concepts fully by just reading or listening. In the absence of haptic channels, the quality and quantity of information transmitted through an interface and the efficiency of the learning and comprehension process both decrease. Particularly in distance learning, the absence of this sense, although less than other

perceptions, does negatively affect the acquired cognitive outcomes. In this context, haptic experiences that are also being developed in the digital environment can provide a space for learning by doing, enriching the existing audiovisual environment through direct experience.

Today's advanced computer networks carry information related to both the auditory sense (e.g., sounds and speech) and the visual sense (e.g., videos, graphics, and text)—a format that is common today. Embedding haptic feedback into these networks and applications and distributing them over the internet, activating other senses in so doing, will create the potential to solve the existing bottlenecks in distance learning (Hamza-Lup, and Stanescu, 2010, p. 79). In the case that distance learning becomes widespread in architecture and design studios, such digital haptic applications can gain importance in terms of providing an experience for the students' sensorial awareness, even if the latter is limited to haptic experience.

5. Conclusion

As some of the students have stated, the virtual tours that they take online—intended to serve as representations of the environments they work in—create a restrictive framework compared to perceiving and observing architecture on-site, in turn affecting their ability to develop flexible approaches to design. Current technologies such as virtual reality and augmented reality have the potential to radically alter perceptions and perspectives on architecture. However, the direct multi-modal experience of the physical environment brings a deeper, more effective understanding of the world than these technologies. Understanding architecture only through the digital representations of the physical world and "representing" appears as an altering factor in a holistic architectural perspective. Architectural education and design studios built on a representative world also create a mechanical, reduced, over-designed, and over-engineered world in this context.

The prospective designer who is formed in a fully digitalized context may hence stay away from real-life experiences of architecture. The designer may as such produce perceptual losses in the haptic and olfactory realms, as their perception moves away from the multidimensional integrity of the mobile world toward the digital world. In this case, do digital screens turn into a monotypic design perspective that takes place in the form of more rational prototyping, in the form of shortcut problems for designers, developing solutions without understanding the atmospheric character of the spaces?

Within the scope of the haptic methodology of design and neuroarchitecture today, the role of haptic perception within the pedagogy of the architecture studio should be reconsidered and engaged within changing educational frameworks. It is a fact that digital education will gain even more importance in the future, despite the fact that designers have been advocating for the priority of the sense of touch for years, at every opportunity. The results of this study also support the importance of the sense of touch. Perhaps in the future, we will encounter more digital haptics in architecture and design education. However, evaluating hapticity and its perception through measuring or comparing the role hereof is also the subject of another study.

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A Design Task for Sivas Grand Mosque's Minaret: Vertical Construction/Formal Articulation/Visual Stimuli

Ugur Tuztasi
Cumhuriyet University, Faculty of Architecture, Fine Arts and Design, Sivas, Turkey (Corresponding author)
Pinar Koc
Cumhuriyet University, Faculty of Architecture, Fine Arts and Design, Sivas, Turkey

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U. Tuztasi ORCID: 0000-0003-3668-5665, P. Koc ORCID: 0000-0001-8727-2655
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Abstract: As well as a design process, experimental practices in architectural education are associated with the analytical approaches of visual thinking and visual reasoning. The main purpose of this study was to explore creative methods for devising a vertical construction through visual reasoning. In terms of experimental practices, design research is based on exploration while the primary research area in architecture is reframed by constantly renewed approaches. Accordingly, the hypothesis of this study was that creative methods would improve when the creation of a vertical construction in architectural education is nourished by visual stimuli. The study searched for a construction that plasticized the vertical spatiality of Sivas Grand Mosque's minaret. The method was shaped by a prerequisite dialogue that rests on visual stimuli. The expected outcome of this dialogue was that the minaret as a pure form would be subjected to an abstraction and, a design proposal then developed for its current structural problems. The results indicated a two-fold appreciation of design. First, when the minaret was maintained within the idea of stabilization rather than being construed as a pure form, the search for a creative method of vertical construction was handled in the context of static preservation. Second, when Sivas Grand Mosque's minaret as an imaginary design tool was construed as a pure form and the abstraction level increased through visual reasoning, the outcomes gradually demonstrated an approach akin to experimental practices.

Keywords: Architectural education, Creative method, Sivas Grand Mosque, Visual reasoning, Visual stimuli.

1.Introduction

In architectural education, visual thinking activated through reasoning directly defines the mental mechanism of design. This is a highly complicated process that involves decomposing a design into its elements and revealing it through a theory that can be construed as content. Although the process, which is somewhat obscure, is often crystallized through cognitive studies, there is as yet no agreed theory or approach. For this reason, experimental practices and innovative approaches in architectural education have sought to realize various approaches to determining visual thinking and visual reasoning by exploring the cognitive aspect of the design process through a convergent lens. In this follow-up, protocol analyzes applied through variables, case-based studies, and workshops based on small applications came to the fore as methods that provide information entry, while the accumulation of knowledge and a change in the way it was perceived over time has led to the diversification of design research. Thus, new vocabulary has been

added to the literature on design research and new pools of knowledge have been created. This not only led to the accumulation of a significant corpus on design education but also played a role in encouraging new experimental practices. Therefore, updating knowledge on architectural education, while increasing exploratory research, has faced a notable obstacle where the field of knowledge has changed by encountering the basic problems of the design. In this study, a design problem, which is one of the main research topics of architectural education, was presented and potential solutions were investigated.

More precisely, the main aim of this research was to seek creative methods for developing a vertical construction through visual reasoning. There are two key concepts involved in this process. The first is the creative method, and the other is the concept of visual reasoning. While the concept of creative method marks the de facto relationship between design activity and cognitive activity, creativity can be accepted as an attainment of the mental mechanism that can be associated more directly with the design process. Visual reasoning is a formatting tool that directs the design process as part of the creative method. Both the creative method and visual reasoning function explicitly and/or implicitly as a pedagogical tool in design education. They are also tools for repositioning knowledge in design research. The rediscovery of the main problem areas in architecture through experimental practices opens up a field that not only changes knowledge of the design but also the visual thinking that guides the design skills. Accordingly, the hypothesis of this study was that creative methods can expand when the notion of creating a vertical construction, a notable design problem in architectural education, is fed with visual stimuli. At this point, the creative method can be construed as a process that facilitates the crystallization of visual reasoning and the selection of approaches to design.

Within the scope of this study, the idea of creating a vertical construction was fed with visual stimuli in two ways. The first stimulus came from images selected from web-based systems while the second stimulus was the spatial state of the element existing in the urban space. Examples selected from digital platforms served to express what is meant by the vertical construction, while the stimulus chosen from the urban space described the context in which the vertical construction will be located. First, it is necessary to ascertain the mental connotations of the vertical construction, which at this point should not be that of a high-tech building or a skyscraper-like structure. On the contrary, an image that is shaped independently of problem areas such as function and context defines an axis with its vertical orientation in any spatial location at any urban scale, and has a strong tectonic effect. When such a stimulus is mentioned in the urban space, the first images that come to mind are mostly minarets. For this purpose, Sivas Grand Mosque's minaret was employed as a second stimulus. To reveal the correlation between creative method and visual reasoning, the vertical construction needed to be formed around the minaret. Within the scope of such a research problem, the aim was not to aestheticize the minaret but to investigate ways of creating a plastic effect on the axis of its vertical spatiality. It is also important to emphasize that more conservative parameters such as additional construction of the historical building or preservation/consolidation alternatives were not pursued as a preliminary design goal. The structural setup of the Sivas Grand Mosque's minaret, which has gradually started to bend, was accepted as another inevitable piece of information for the design of the construction in the vertical direction. Therefore, while looking for ways to diversify the approaches derived from plasticizing a visible construction in the image of the city, the search for a design that would fix the current status of the minaret was initiated. The concepts of a visual stimulus, creativity, and visual reasoning are explored in detail in the next chapter.

2. Theoretical Framework

There were two basic concepts that guided the formation of the theoretical component of this study. The first of these was the creative method and the related concept of creativity, while the other was the concept of visual reasoning. In addition, due to the methodological approach adopted, another issue that needed to be addressed was the type of effect the images given as stimuli have on the mental activity or visual reasoning of the participants. According to Goldschmidt and Smolkov (2006), designers think visually, which means that images which serve the designers' thinking consist of forms and shapes. Therefore, the stimuli presented in the study were used as a form of inspiration tactic for the participants. Moreover, within the scope of the study, stimuli were evaluated as part of the strategy of inspiring, being influenced, and organizing thoughts. Another purpose for presenting the stimuli was to expand the field of design carried out by the participants, who were all studying architecture, with limited images. Like the participants in a study conducted by Goncalves et al. (2014) in the field of design education, the design students were surrounded by a limited group of stimuli and regularly employ a limited number of intellectual methods. Therefore, the stimulus was positioned as design information that directly affects both creativity and visual reasoning and needs to be processed.

However, although a comprehensive theory has not yet been developed, it is important to remember that creativity may emerge under certain special conditions in terms of various common points and characterized by novel and unusual features as a product of a creative action (Akin, 2008). Finke (1996) states that creativity is neither completely controlled nor completely unplanned, but instead arises either from the deliberate work of the human mind or from its spontaneous, intuitive qualities. According to Daniels-McGhee and Davis (1994), while the creative individual has high control of voluntary executive processes such as the selective attention, manipulation, and reconstruction of mental images, the involuntary processes of perceptual organization often become information reduction processes. Creativity is also associated with specialization. For example, the development of expertise in design is marked as a non-linear process, starting from the early stages of design education and continuing until a certain level of proficiency is reached in a specific field (Goncalves et al., 2014). A basic definition of creativity cannot therefore be posited and a valid threshold point for creativity for designers cannot be determined. However, Dorst and Cross (2001) state that creative design includes a process of discovery in which the problem and solution space evolves and is unstable until it is fixed by a bridge that defines the problem-solution pair. This means that in a creative design, there is no process by which the problem is identified and the solution is developed; rather ideas regarding the problem and the solution are formulated and developed in tandem through a circular iteration. In this context, visual reasoning, which lies at the heart of creative design, should be viewed as the processing of visual thought in mental activity.

According to Goldschmidt (1994), visual reasoning is a process that gives birth to ideas and leads to the creation of form in design. Alternatively, Park and Kim (2007) define visual reasoning as an iterative process consisting of visual analysis, visual synthesis, and modeling, and can be classified as seeing, imagining and drawing. Visual reasoning activates visual thinking and transforms images from simply being a visual representation into tools of cognitive processing that contribute to the generation of design ideas. Visual thinking is stimulated by mechanisms such as perception, abstraction, reduction, and selection in accordance with the rhythm of the work. During this process, the main visual stimuli derived from the legibility of contour, geometric form, and texture are important; because the reasoning derived from these prototypes makes use of the knowledge of the objects, shapes, and textures contained in the visual image (Oxman, 2002). The process of visual analysis, visual synthesis, and modeling acquired through stimuli can thus

trigger the discovery of creative methods and ideas. Moreover, it reveals a kind of formal selection and a stage of visual reasoning regarding the emergence of a form. As stated by Liu (1995), when looking at drawings at any stage of the design process, a designer naturally reconstructs given forms in order to adapt design requirements and realize his or her intention. According to Kosslyn (1973), the notion that the internal structure of an image resembles the spatial structure of its referent usually characterizes long-term memory or generative images. Visual experience and visual accumulation can, of course, form an important part of this process. However, starting to see the form, object, or texture in a drawing or image is a model for seeing and creating forms in design.

In the axis of this study, it was expected that visual reasoning would be activated through stimuli and that this process would result in creative methods, which refers to the discovery of the unexpected and the novel. In a study of unexpected discoveries and design sketches, Suwa et al. (1999) describes the former as a form of perceptual interaction with a sketch and relates this to a process in which the hidden qualities of visual/spatial representation are perceived. If we apply this expression to the axis of stimuli that manipulate visual reasoning within the scope of the current study, qualities such as contour, geometric shape, or texture can be selected from among the stimuli, as a result of which hidden lines can be discovered. In such an exploration, formal composition has to contend with the limits of mental imagery, while visual reasoning invents hidden content and uncovers new design ideas. Mental imagery is thus seen as an initial source of potential ideas and is critically involved in the discovery process (Anderson & Helstrup, 1993). Visual reasoning then results in a formal analysis that will generate potential design discoveries. Put another way, stimulating visuals in creative methods are effective in terms of visual reasoning. Seeing and selecting an object, a shape, or a texture in an image contribute to the creative method since potential design discoveries will reveal. This design behavior means that stimulating visuals in creative methods make an attempt to create a form in the mental imagery. Thus, hidden contents and new design ideas are revealed. Stimulating visuals in creative methods are employed as organizing thoughts and comprehending design knowledge. For example, while stimulating visuals inspire with their contour, geometric shape, or texture, mental imagery of participants of this study expands. Instead of employing limited images in visual reasoning, participants of this study encounter renewed ideas and thoughts. This attempt prevents the reduction of mental imagery of the participants, and reveals the novel and unusual relationships of visual/spatial content in design. Ultimately, design is marked by a process involving the generation and reasoning of ideas about form (Gero, 1999). In this study, an attempt was made to understand the stages of visual reasoning in the creation of the form and thus determine whether a creative method could be discovered.

3. Method

To generate creative methods for creating a vertical construction through visual reasoning, this study was implemented as a design task. This comprised a sketch exam spread over a 2-week period during the 2020-2021 spring semester for a group of 25 Architectural Project VIII students in the Department of Architecture at Sivas Cumhuriyet University. The first stage of the study began with the presentation of images selected from web-based systems. These examples, which were shown to the student group as a stimulus, were selected on the axis of the concepts of verticality and plasticity, horizontal-vertical compactness, constructive spirality, and, finally, linearity. Furthermore, because the design task would proceed through the relationship between cognitive activity and visual reasoning, another stimulus was introduced to assist visual reasoning. The stimulus chosen was a strong image of the city defined by contextual relations. Creating a vertical structure and transforming it into a construction with a plastic effect can be facilitated by content that assists visual thinking. Because such content will provide a

definition of space that develops in a vertical direction, the method was consolidated by using another vertical element to support visual reasoning. Accordingly, Sivas Grand Mosque's minaret was instrumentalized as a design component based on its pure plastic value rather being the subject of any historiographic research. The minaret was principally a stimulus for visual reasoning in design, without seeking any reinforcement, preservation, or additional construction of the historical building. However, it should be noted that due to the structural setup of the minaret, which tends to bend, the idea of fixing the minaret was included in the design searches in some parts of the study. As such, the minaret was transformed into a pure object primarily by being purged of the contextual relations and semantic loads in which it is located. This is because perception, which can abstract objects from their context, can also comprehend form as an organized structure (Arnheim, 2009). However, this does not mean that the minaret was to be placed in another spatial envelope, but rather that a legitimate approach was taken to plasticize the vertical orientation defined by the spatial context. On the other hand, conceiving the Grand Mosque's minaret as an object rising only in a vertical direction also meant reducing it in a formal way. According to Arnheim (2009), seeing an object means making a distinction between the properties of the object itself and the properties imposed by the environment. As a stimulating object, the Grand Mosque's minaret also evokes a definition of space in the vertical direction, and thus constitutes a given information mechanism for the student group dealing with the design problem.

Once the actual relationship between the object-seeing act is established, a construction is expected to be realized that wraps around the stimulus object and rises in the vertical direction. Seeing can be viewed as the first design activity that initiates cognitive activity. In other words, seeing and perceiving when the cognitive process begins determines the limits of the mental mechanism. For this reason, the method of work tends to create a form through design after the object encounters the act of seeing. After all, form is the ultimate object of design, and the process of form making can be pictured as a series of subsystems that are free to adapt and/or interconnect independently (Alexander, 1973). It is this sequence of subsystems and activities that delineates visual reasoning, while creativity constitutes the mental skill element of the ability to design. Sivas Grand Mosque's minaret is therefore a formal element that helps to create a vertical construction and needs to be plasticized. In summary, in this paper, the design practice equipment, students' approaches to the subject, and the relationship between design results and targeted design inputs are discussed. Similar design approaches within the group of 25 students are collated, following which prominent designs are selected and the work of 6 students classified in the context of dominant elements in design approaches. As a result, an analysis is conducted of the solution proposals brought by the students to the design problems.

4. Findings and Discussion

The first phase of the study essentially consisted of preliminary and informative presentations. Accordingly, to explain what is meant by vertical construction and thus to help visual reasoning, appropriate images from web-based systems were selected and presented to the student group as the first stimulus. Examples were presented on the axis of verticality and plasticity, horizontal-vertical compactness, constructive spirality, and linearity (Figure 1). The second stage was to perform the design act through the creative method. It was expected that students would create a construction that would plasticize the vertical orientation defined by the minaret. At this point, two more basic conditions were requested from the student group. The first was that the vertical construction is plastic so that it will not damage the texture of the minaret; the second was the development of a constructive approach that will stabilize the current state of the minaret, which has started to tilt. It should be noted that construing the minaret as a pure object implies a cognitive process based solely on perceptual performance. However, the fact that certain conditions are met in the development of a construction that will

plasticize the vertical orientation around the minaret does not prevent the minaret from being purged of contextual and semantic contents and understood as a mere stimulus. Only transparent points of connection between the object and the target are imagined here. The construction created after the stimulus is presented will eventually develop a new definition of spatiality along with the vertical orientation as it will take place in the city view. Therefore, both stages of the study essentially involved the formal study of a construction rising in the vertical direction, and in this, the vertical orientation of the Grand Mosque's minaret was instrumentalized as an axis.

However, the results obtained revealed a two-fold approach that deviated from the theoretical framework defined within the scope of visual reasoning-creativity. According to the study hypothesis, the stimulus is an auxiliary image that will trigger visual reasoning, and the stages of design should define the area where the new spatial forms that wrap along the vertical orientation will be located. Because the aim of the study was to design a vertical construction, it was assumed that more independent relationships could be established from the stimulus. The findings indicated that the minaret as a stimulus preceded visual reasoning. In other words, two conditions that were not prioritized in terms of methodology overshadowed the creative method and visual reasoning at the design stage. For this reason, a plasticity weave that will not damage the texture of the minaret in terms of the final products and the request to fix the current state

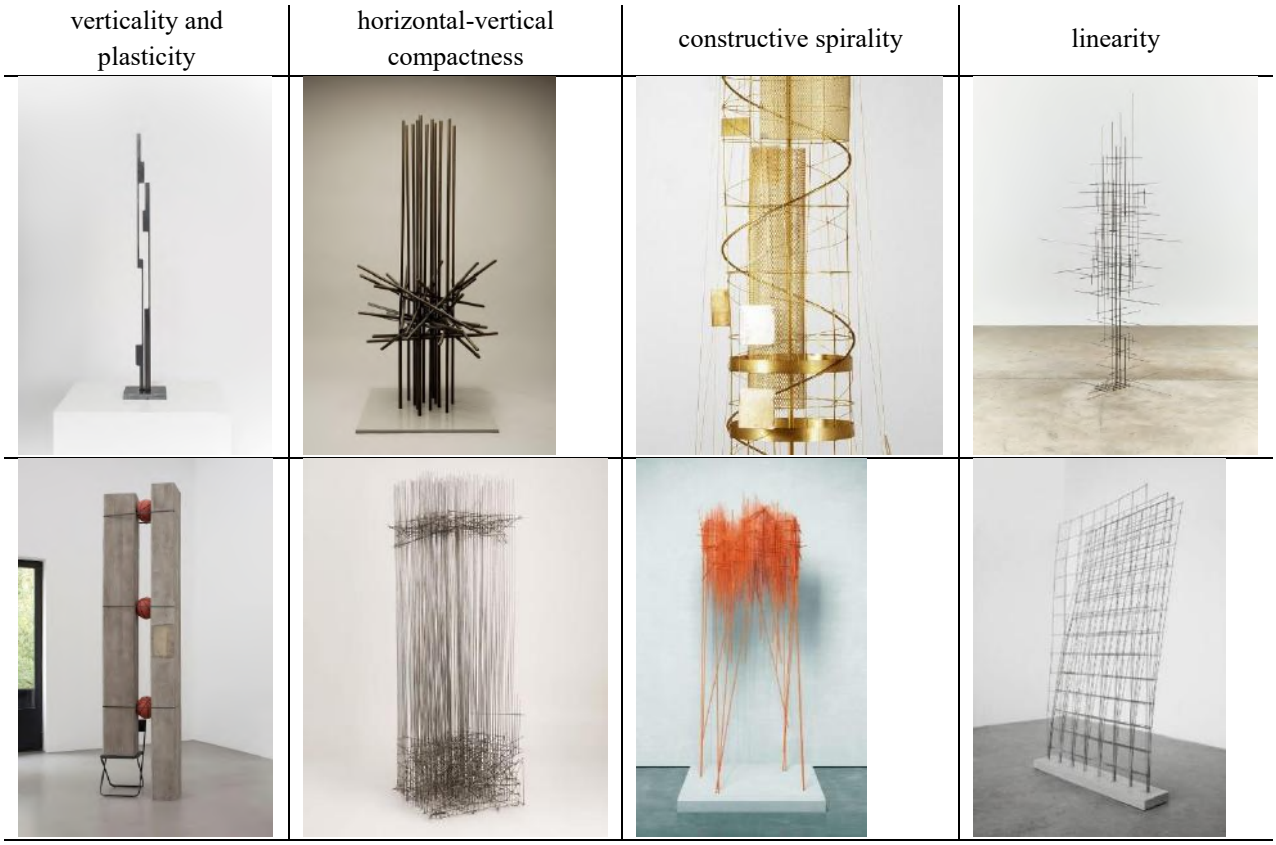

Figure 1. A selection of images shown to the student group as the first stimuli (URL-1-8).

of the minaret exceeded the aim of searching for creative methods of building a vertical construction through visual reasoning. It is also important to note that the dominant content of the minaret image has an effect on this. However, the idea of reducing the minaret in terms of form remained a rather weak design component: so much so that the images explaining what is meant by vertical construction at the beginning of the study revealed that the student group was not defined as an adequate sample in terms of the cognitive activity process. In other words, in the first stage of the study, presenting the images taken from web-based systems as the first stimulus and defining the design problem were insufficient to expand the creative methods needed to form a vertical construction through visual reasoning. Rather than perceiving this as an unsuccessful orientation in terms of the outcome of the study, a more inclusive approach is to state that the design process resulted in a two-way evaluation. Accordingly, a plasticity weave that will not damage the texture of the minaret and the need to fix the current state of the minaret became a more dominant orientation during the design stages. The plasticity patterning the linearity of the minaret was handled in the context of static conservation and was conceived as a supportive design element.

For example, student 1 (Firuze Tepeli) approached the design problem by directly prioritizing the issue of the support structure. Although she understood the minaret as a singular object, during the design phase she added components that reminded her that the minaret belongs to the Sivas Grand Mosque. Among the first stimuli given to assist visual reasoning, the verticality and plasticity phenomenon came to the fore in the design. The written report regarding the design stated that the mainframe, which was created as a

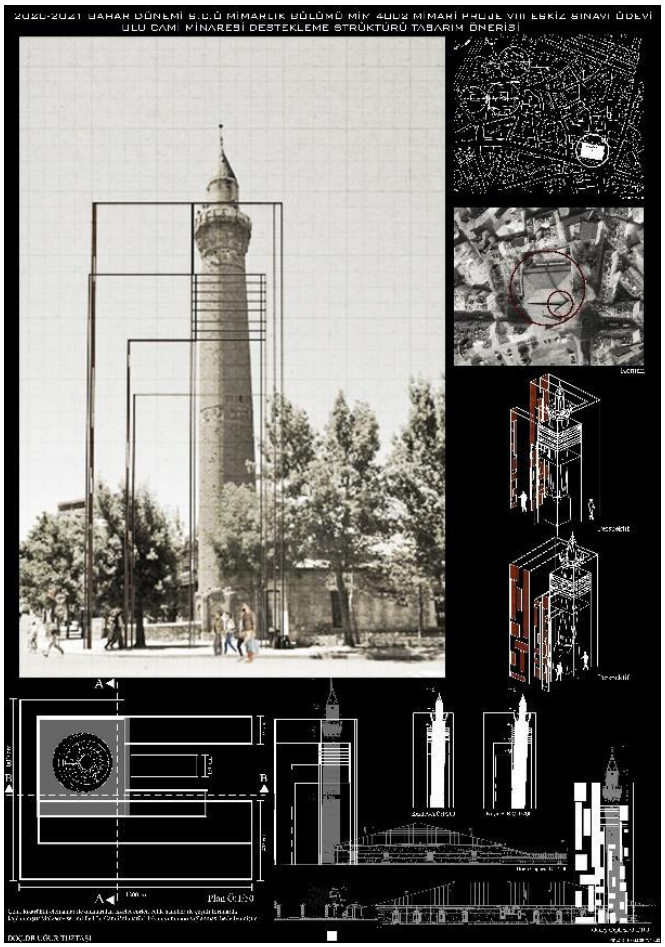

Figure 2. Example of vertical construction created by Student 1.

vertical construction, was designed as a calling element and the minaret body was gently wrapped. The main triggering element for visual reasoning on the axis of verticality and plasticity was derived from the material and textural relations of the minaret. In contrast to the continuous texture of the existing material of the minaret, a definition of spatiality framed by different directions and extensions was developed using steel material of different sizes in the vertical construction design. In such a definition of spatiality, the concern not to cover the minaret more than necessary came to the fore. According to the written report, the aim was to increase the visibility of the minaret by determining components such as openness and transparency in the design setup. Moreover, panels of different dimensions were added to the eastern line of the vertical construction; this part was marked with design components based on written information, which once again remembered the Grand Mosque as a historiographic subject (Figure 2).

Student 2 (Batuhan Can) approached the design problem on the axis of constructive spirality. For Student 2, this marked a process in which visual reasoning became stuck between the stimulus and the object. This was because the minaret, which was expected to be reduced to a pure form, had become a part of a solution that focused on its structural problems as an object. Accordingly, the minaret was conceived as a singular object, and a design attributed to simplicity was developed in the vertical construction proposal. According to the written report, the purpose of applying the concept of simplicity was to prevent the stonework of the minaret from being thrown back. It also emerged in this example that the minaret as a stimulus had been handled with a content that, rather than a formal reduction, could not be separated from its contextual relations. The search for a creative method focused entirely on finding solutions to the structural problems of the minaret, and the end product became a supporting element that

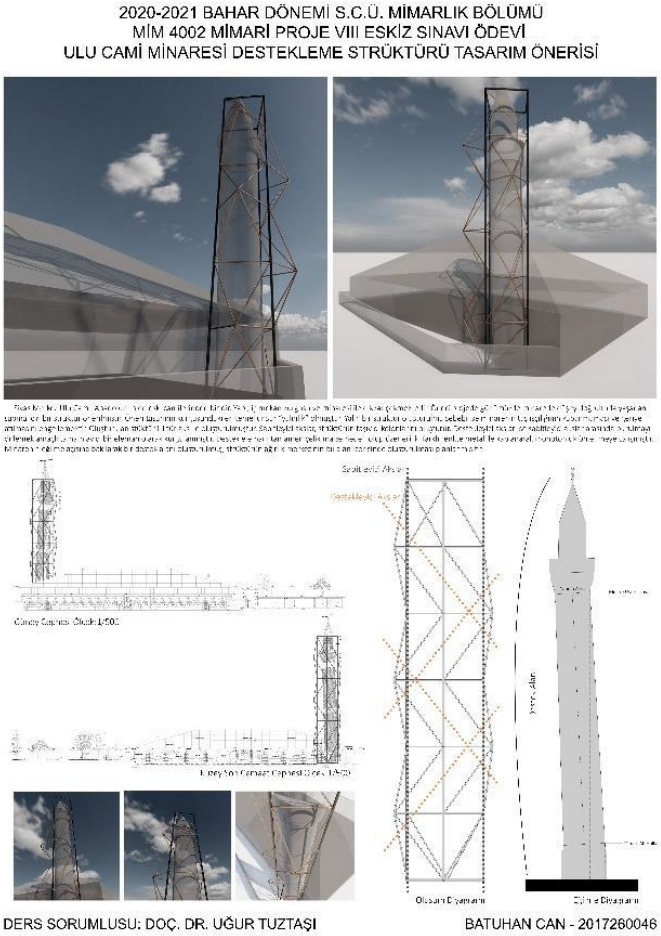

Figure 3. Example of vertical construction created by Student 2.

wrapped around the minaret. In fact, a bending diagram was created during the design phase and a vertical construction was designed accordingly by determining a support area. Moreover, the stage of visual reasoning was entirely governed by the stabilizing and supporting axes, in which the vertical construction was wrapped around the axis of the minaret's tilt angle (Figure 3).

Student 3 (Ceyda Aslan) developed an approach that considered both the minaret and its immediate surroundings. Accordingly, the constructive element that plasticized the minaret and rose in the vertical direction expanded horizontally at ground level and framed the area on which the minaret sat. Such design behavior reveals that the subject was perceived by student 3 as a search for a solution to the physical problems brought about by contextual conditions. With the new design proposal, the minaret was not only fixed but also its visibility was increased. For this purpose, the constructive element rising in the vertical direction was addressed by an approach that consisted of horizontal-vertical axes and was constructed with a full-empty balance. In addition, the same design behavior was constructed horizontally along the area where the minaret base sat, redefining the approach and perception of the minaret in the urban space. While making use of the horizontal-vertical compactness relationship in the vertical construction design, the circular elements anchored to the minaret body in the new design were defined within the protection of horizontal-vertical compactness. In other words, visual reasoning by student 3 was realized with a strong preservation reflex (Figure 4).

Figure 4. Example of vertical construction created by Student 3.

Student 4 (İhsan Ceylan) utilized images among the first stimuli that defined the concept of linearity. He conceived the minaret as a singular object. However, the new design proposal was characterized as an auxiliary structure created to support the minaret. Visual reasoning in the design proposal was provided by linear elements that plasticized the vertical spatiality of the minaret, and the concern to develop a creative method in terms of vertical construction was greater than in other design proposals. While the new design was wrapped around the existing axis of the minaret, the prominent design behavior emerged as a realization of an understanding that would renew the perception of the minaret with unique content. Although the vertical construction was described as an auxiliary structure by Student 4, it established a permeable link between the characteristic content of the design proposal, the way the minaret is conceived as an object, and the plasticization of the minaret's vertical spatiality (Figure 5).

Student 5 (Tuğçe Koç) sought to develop a creative method on the axis of the constructive spiral presented among the images shown as the first stimulus. The minaret was initially conceived as a singular object and a pure form, following which the structural setup of the minaret was discussed. Emphasizing the balance factor as a design principle guided the construction of the design proposal. Accordingly, a construction that developed in the opposite direction to the tilt of the minaret was designed, resulting in the discovery of a new tilt angle created in response to the load transferred by the minaret toward the tilted direction. While the entire construction was wrapped around this angle, the steel skeleton in the design proposal was transformed into an experiment in which balance is achieved with

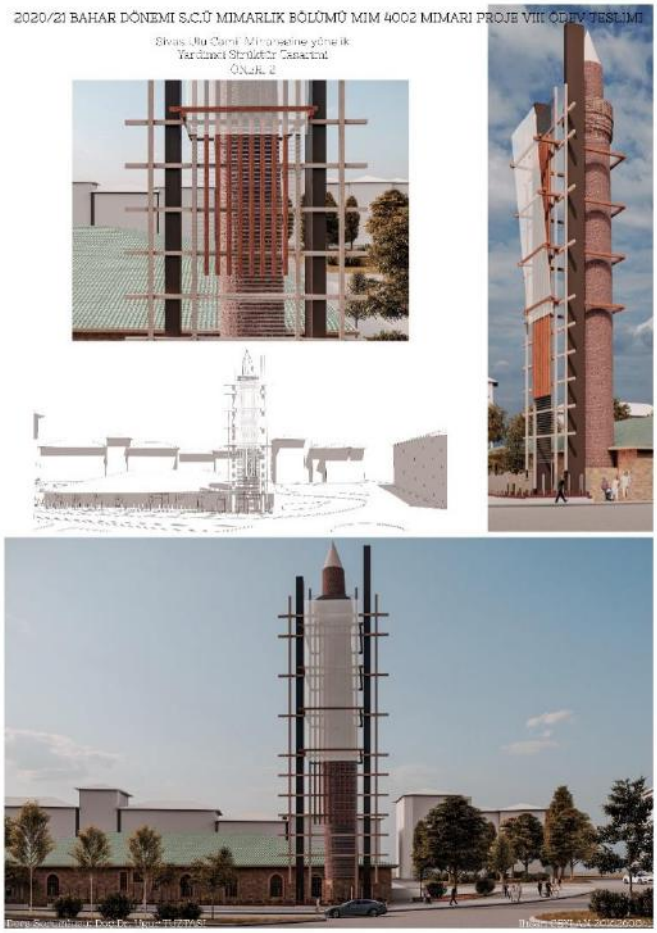

Figure 5. Example of vertical construction created by Student 4.

tensile force. In addition, it should be noted that although student 5 continued to adopt a certain preservation reflex for the minaret, this was not exposed to any disconnection, tension, or prioritization in the development of the design proposal (i.e., in the relationship between visual reasoning and creative method). On the contrary, the minaret and tilting problem, which constitutes the object-target relation, was deliberately abstracted from its context and conceived as the design information for an experimental application (Figure 6).

Student 6 (Emine Şen) developed an approach that considered both the minaret and its immediate surroundings. For student 6, the design task appeared as a search for a solution to the physical problems caused by the contextual conditions and other problems arising from the chaotic appearance of the urban space. Accordingly, she developed a new design proposal on the axis of constructive spirality, creating a structure that would stabilize the minaret's current state rather than plasticizing its vertical spatiality. Visual reasoning was limited by a strong preservation reflex. The design proposal

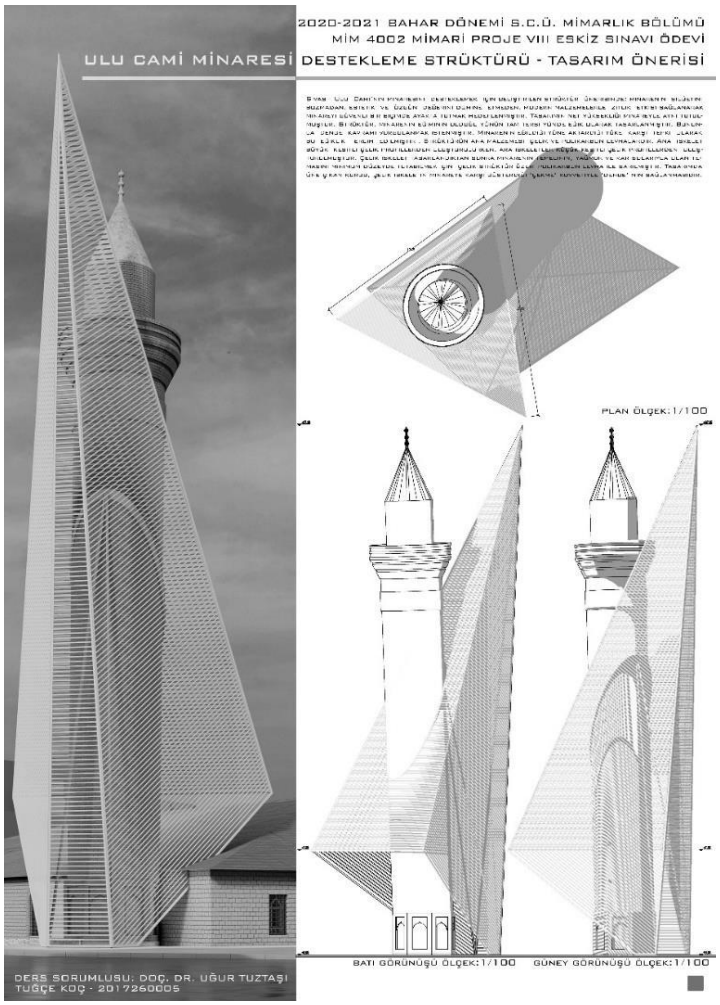

Figure 6. Example of vertical construction created by Student 5.

developed on the axis of constructive spirality was handled using an approach that strived not to disturb the texture of the minaret and to increase its visibility. At this stage, the search for a creative method was completed by a weak process consolidated by unstable linear elements. The aim of producing solutions to structural problems came to the fore in terms of the object-target relationship and the design proposal was formulated to increase the perception of the minaret (Figure 7).

In terms of a general evaluation of the design selections, the search for creative methods of developing a vertical construction was conceived by student 1 as a formal process in which limited stimuli were used and the contextual relations of the minaret were partially purified. In the visual reasoning stage, the perception of the object (minaret) as a stimulus was limited and the creative method was characterized by the two basic conditions presented for the minaret. Although the vertical spatiality of the minaret was plasticized in the design, a return to the context had taken place. Student 2 developed a solution to deal with structural problems. Instead of looking for creative methods for building a vertical construction in the design, the existing contextual problems of the minaret were handled on a singular scale and an extremely strong supporting element was created on the constructive axis. By contrast, Student 3 was inspired by the initial stimuli displayed on the horizontal-vertical compactness axis to create a vertical

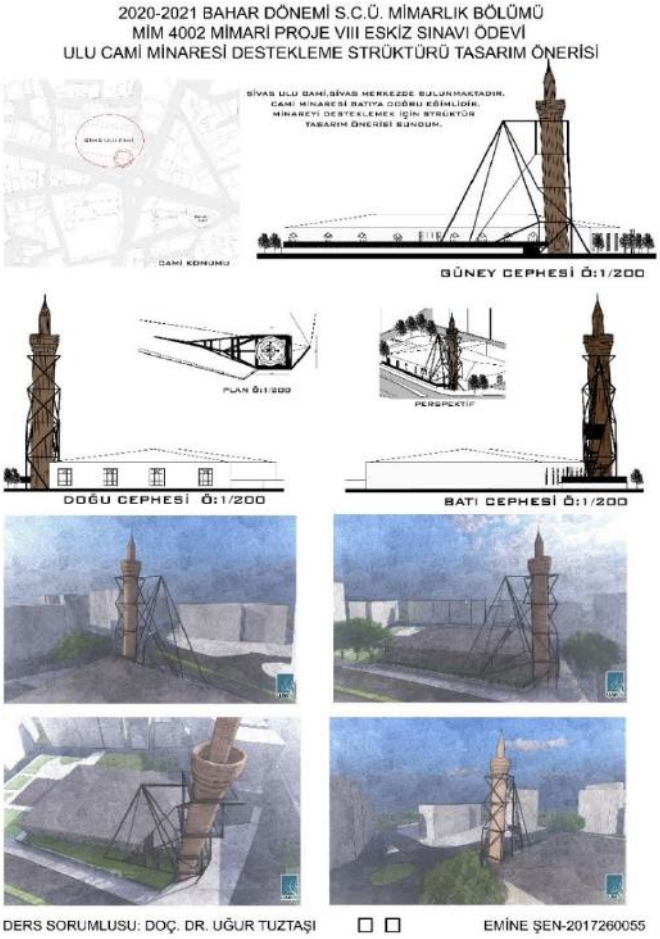

Figure 7. Example of vertical construction created by Student 6.

construction. However, this resulted in a conservative design behavior that could not free the visual reasoning stage from the contextual and semantic contents of the minaret. In the new design proposal, the minaret was plasticized both vertically and horizontally, but the search for a creative method in design was stuck inside the contextual shell of the Grand Mosque's minaret. Student 4 preferred to construe the minaret as a singular object and in a pure form so that its vertical spatiality was fed with more characteristic contents compared to the other design proposals. While the images presented as the first stimulus strongly guided their visual reasoning, the linear pattern surrounding the minaret described a creative field of experimentation. Student 5 also understood the minaret as a singular object and a pure form and developed an experimental creative method. While visual reasoning developed on the axis of constructive spirality, the relationship between object and purpose was dealt with out of context. Finally, student 6 focused on the contextual and physical problems of the minaret and its immediate surroundings and developed the design proposal in line with a strong conservative reflex. Although she strived to present a design proposal on the axis of constructive spirality, she could not reduce the minaret to an object or pure form as a stimulus during the visual reasoning stage. Nevertheless, student 6, who still focused on generating an experimental proposal, designed the experimentation to increase the perceptibility of the minaret. In short, in this study, which sought creative methods for developing a vertical construction through visual reasoning, the design evaluation process resulted in a two-way situation. In terms of visual reasoning, this evolved into a more dominant consideration of the two basic conditions initially presented regarding the minaret. The search for a creative method that would plasticize the spatiality defined by the minaret in the vertical direction remained wedded to the notion of preservation-stabilization. The plasticity patterning of the minaret linearity was handled in the context of static conservation and a supporting structure was developed accordingly (Figure 8).

Figure 8. A diagram for conclusion.

5. Conclusion

To develop creative methods for building a vertical construction through visual reasoning, a design task was devised and implemented. The first stage of this task involved the presentation of images selected from web-based systems, while the second stage involved presenting the other visual stimulus, Sivas Grand Mosque's minaret, free of contextual relations and semantic loads. The main purpose for providing visual stimuli was to test the hypothesis that creative methods can expand when the idea of creating a vertical construction is fed with visual stimuli. Accordingly, the study resulted in two distinct kinds of outcomes. When the hypothesis of the study was considered in terms of end products, a group that perceived the minaret as a singular object and the minaret as the main element emerged. The resulting proposals indicated that this group put forward more advanced creative methods. The connection between visual reasoning and creative method became stronger when the Grand Mosque's minaret was conceived as a pure form, freed from its contextual and semantic content. In other words, as the contribution of the visual stimulus to cognitive processes as a pure object increased, qualities such as contour, shape, and texture in the stimulus exerted a stronger effect on the new design. By contrast, the group who understood the minaret not as a pure object but as the main element, and the construction to be designed as an auxiliary element, could not free themselves from the contextual, semantic, and symbolic contents of the minaret. In addition, a design behavior with a high conservative reflex was exhibited, which had an extremely rigid and limiting effect on the stages of visual reasoning. At this point, it should be stated another issue in this design task. Perception of the whole building with its new vertical construction is not completely neglected in design process. Grand Mosque's minaret equalizes the horizontal spatiality of the mosque's mass. This marks an integrated spatiality. For this reason, relationship between the mosque and the minaret and the role of the new vertical construction were discussed at the beginning. From the point of design proposals, it is clear that this issue is considered as a supplementary component of the whole silhouette.

The idea of designing a vertical construction as a constant variable is characterized in accordance with individual tendencies when fed by visual stimuli. In terms of the hypothesis of the study, this means that the correlation between visual stimulus and visual reasoning tends to be deduced. Inevitably, visual reasoning varies according to individual differences. However, the results indicate that as the degree of abstraction increases in visual reasoning and visual stimuli are placed in the center, the anxiety to seek creative methods also increases and the final product becomes closer to the experimental one. Put another way, as the degree of abstraction increases in visual reasoning and the visual stimulus is purified, the potential for making unexpected discoveries also increases. The main difference between unexpected and casual discoveries is that an active stage of visual reasoning has taken place. For this reason, a recommendation is made to develop new cognitive methods in architectural education that will separate the stages of visual stimulus and visual reasoning. The study also provides a starting point for experimental practices that will explore cognitive orientations in architectural education.

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An Attempt to Fill the Gap between the Architectural Studies and Conceptualization in Architectural Thesis Design Studio

Rahman Tafahomi
Department of Architecture, School of Architecture and Built Environment, College of Science and Technology, the University of Rwanda, Rwanda

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R. Tafahomi ORCID: 0000-0002-7172-1302,
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Abstract: The aim of this paper is to evaluate the application of a theoretical framework in the architecture thesis project to discover the effectiveness of the exercise on the thesis projects. It was common to observe that the students prepared the architectural thesis project with limited, unstructured, or disconnected studies to analysis, programming, and conceptualization phases. A theoretical framework model was tested to evaluate the effects on the learning outcomes of the students. The methodology of the research was designed based on structured observation and content analysis. The findings of the research reveal that the students perceive and understand the studies and the theoretical framework differently. The students demonstrated their theoretical framework with four categorical specifications including information, application, presentation, and communication. The information referred to data and structure of the organization, the application implied the relation between the data collection, analysis and other phases of the thesis project, the presentation illustrated how they applied graphical tools to illustrate the data, and communication revealed the interaction between the students and the panel of juries and participants. In conclusion, the theoretical framework connects the studies to the concept generation and opens a new door for the discussion of the architectural studies and lessons learnt between the panel of juries, the students, and peers. For an effective expectation from the theoretical framework outputs, detailed guidelines could harmonize the students' outputs due to the verieties of the application, interpretation, and demonstration of the architectural theoretical frameworks.

Keywords: Architecture Thesis, Theoretical Framework, Information, Application, Presentation, Communication.

Introduction

The thesis program in undergraduate studies is a key design activity to demonstrate the ability of the students in solving problems through design decisions (Ghonim & Eweda, 2019). The thesis project is under influence of different factors to fulfill the task such as inspiration, analysis, and conceptualization phases (Tafahomi, 2021a). The thesis or final year project also widely was discussed as a process of problem-solving through studies, analysis, and design decisions by the students (Borden & Ray,

2006; Mauch & Park, 2003). Although the thesis project is a student project, it is openly under influence of the juries, supervisors, and peer-students from the first stage (Tafahomi, 2021a) as a collective knowledge output (Borden & Ray, 2006). Seemingly, the quality of a thesis project not only represent the students' skills and knowledge but also identifies the approach and methods of the department to train the students (Brown & Renshaw, 2006; Mindrup, 2014).

According to the curriculum of the undergraduate program in architecture, students are supposed to do a thesis project as the final task to fulfill the program (DoF, 2014). The thesis is mentioned in the curriculum as a research-based design activity that continues for two semesters in one academic year, which is divided into thesis one and two. Although thesis two focuses on design development, thesis one has been divided into three modules including Research and Documentation, Project Programming, and Conceptualization. The curriculum expected studies, research, and analysis activities from the students although the content of the modules has less been detailed to lead the students for different activities in thesis processes. However, the thesis projects of the students could demonstrate that the results of the studies did less take into consideration seriously by both students and supervisors. The study identified that the students seriously followed the supervisors, module leaders, and the peer-students in the thesis process more in the 'personal procedure' than a systematic process (Tafahomi, 2021a, p. 15). Perhaps the gap took the place in the approach to observe the research activities in the thesis project.

There are two distinguishable approaches for the research and documentation activities in the department due to the background of the staff or the school of thought (Borden & Ray, 2006). On the one hand, there is a group of staff, who assumes that the research activity refers to just redrawing of previous projects, in which the meaning of the architecture is just design (Drexler, 1975; Littmann, 2000; Tafahomi, 2021b). Therefore, doing research is to understand the precedents projects, especially the celebrated projects, which have been designed by the elite architects (Laroche, 2008; Littmann, 2000). This group of staff advocates the research and documentation in terms of the redrawing of precedents projects to inspire the students in the thesis project. This approach also was mentioned by Till in terms of 'architecture is just architecture' than research (Till, 2008, p. 1) and Frayling called 'research in' art and design (Frayling, 1993, p. 2). In this point of view, the architecture knowledge and skills are learnt through architecture study importantly the history, theory, and projects. This group of supervisors expects to see some clusters of redrawing in terms of study, research, and documentation based on the thesis topics such as school, hospital, or museum. They also recommend the students to start the conceptualization through drawing even before research and documentation to advocate a design-precedents-redrawing process.

On the other hand, there is another group of staff and supervisors who expected research activities by the students about the context and users to check the influential aspects of the design process. This group of staff expects to observe a systematic study by the students in the theory and literature to discover that last achieved knowledge in the architecture and technology to apply in the projects (Williams, 2018). This group encourages

the students in the study process to enhance their drawing with logical aspects in the current debates about architectural theories. This group expects two clusters of information from the students including the results of the studies and the synopsis of the precedents projects. Groat and Wang mentioned this group of the researcher in terms of looking for new areas in the architectural demine (Groat & Wang, 2002), which was emphasized by Till in terms of 'A Building as a Research' (Till, 2008, p. 2). Nonetheless, the problem is how the students apply the results in the design process.

The gap is not just the difference between the two approaches in the thesis process. The curriculum also includes just one course with the title of architectural research methodology in the fourth year, which is supposed that the students catch up all missing aspects in the research through it (DoF, 2014). However, the students learn subjects in the department based on the theory with memorizing and final writing exam approach based on the precedents-redrawing-design circulation for design studios, which makes the students far from a process of the research and investigation (Tafahomi, 2021b). Despite the students doing research according to the advice of the lecturers, juries, or supervisors, application of the studies, research and documentation is a big gap in the department. In other words, it is common to observe that the students provide a strong part of the studies and investigation in the thesis activities; however, they can less apply the results in the thesis project. Therefore, the students put away the results of the study and start again the drawing and conceptualization from the beginning.

This result criticizes by both groups of the staff. It means despite the students doing research through other sources, the students start the design activities through sketching, drawing, redrawing based on the lessons learnt from previous years than their own research achievements in the thesis process. Therefore, the first group advocates doing research could possibly waste the time of the students in the academic year and make far them from design activities. This challenge in the department highlights a big gap in the application of the knowledge in the design process in terms of a theoretical framework for the design as the results of the studies in architecture.

In this background, it was hypothesized that by leading the students to represent a theoretical framework as a synopsis of the architectural studies, they could apply the lessons learnt in the design process to fill the gap. The research questions are defined as what is architectural studies in a thesis project, how the students accumulate the knowledge in this process, and what is a theoretical framework for an architectural thesis project? By saying that the main objective of this research is to evaluate the application of the theoretical framework in the study and research in the thesis activities in terms of learning outcomes of the students to fill the gap between the architectural studies and the conceptualization in the thesis projects.

Arguments on the Architectural Studies and Theoretical Framework

There is a wide range of arguments on the relations between architectural theory and practice, study and design, and architectural project and thesis. In addition, there is a variety of products for the students in architecture in terms of source of studies in an undergraduate thesis project such as history and theories, technology and graphics, and precedent projects. The theoretical sources have

analyzed the architectural project through critics (Jencks, 2002; Ots, 2010; Lawson, 2004; Lawson, 2005), analysis (Clark & Pause, 1996; Unwin, 2014), and interpretation (Mugerauer, 1995; Mugerauer, 2014; Lang J. , 1987) of the buildings to discover the theories beyond of the practice. The second cluster as graphic and technology was mentioned as the key elements to transfer the architectural knowledge. A variety of sources could list in this cluster such as architectural drawing (Ching, 1996; Ching, 2010; Ching, 2015), drawing as an expression of an idea (Crowe & Laseau, 2011; Laseau, 2000; White, 1975), drawing as analysis (White, 1983; Regis, 2003; Sperlregen, 2003), and drawing standards (Neufert, 2012). All these clusters of architectural sources have attempted to deliver their own architectural understanding and interpretation of architectural theories and practices through texts, images, and drawing, which could be applied in architectural education and thesis projects.

For example, Mauch and Park (2003, p. 107) emphasized that all thesis and dissertation structures include a studies section to reveal a summary about the 'known and unknown' matters in the field of the study in terms of the theoretical aspects. They revealed that the theoretical and analytical approaches are applied at graduate and postgraduate theses more than undergraduate level. For this reason, they believed that different disciplines include varieties of thesis formats from a research dissertation to a monograph. For example, Bryman applied the work of theoretical framework to demonstrate the level of understating of theories of research in a scientific way (Bryman, 1988). In fact, the framework was applied to construct sets of theories that worked together to deliver the same meaning or supportive meaning of a total idea. In other words, the framework was implied on the theories or facts that work in a specific relationship to represent the epistemological approach (Groat & Wang, 2002). Although the theoretical framework stays on the assumption of the researcher, this notion leads the research for the methodological tools and data analysis (Foddy, 2001). The construction of the theoretical framework could take place in the early of the research or at the end stage (Groat & Wang, 2002).

Creswell (2018) introduced the theoretical framework in terms of philosophical assumption to define and set up knowledge in the research process that refers to the relation between data and theory. The study on the importance of the theoretical framework revealed that the frame leads the research to select appropriate methods and relevant data in the research process (Charmaz, Thornberg, & Keane, 2018). Williams (2018) advocated a synthesis to extract the theoretical studies from the literature in the thesis writing. The study attempted to draw a guideline for the dissertation through an emphasis on the extraction of the relevant theoretical perspective in the logical structure to represent a new set of data to the reader. She recommended some diagrams to summarize and triangulate the different data in the logical presentation by the students. This synopsis of the data was included some level of interpretation by the students in terms of logical style (Borden & Ray, 2006), a reflection of knowledge (Williams, 2018), or content analysis (Krippendorff, 2003), which presented an applicable format of a theoretical framework.

Bloomberg and Volpe (2019, p. 250) designed a guideline for the students to fulfill the dissertation in terms of the 'depository of knowledge' in the field.

They highlighted the objective of the studies in a thesis project in terms of summative, integrated, and related achievement about the problem in the thesis that is needed to be solved through a creative and critical point of view. Therefore, the result of the study is to reformulate a dialogue in an articulated form to represent the assimilation of lessons learnt.

Frayling (1993, pp. 1-2) reclassified research in art and design into three categories including "research in, research through, and research for" art and design. He believed that the activities of designers are part of the research 'in or for' to support design, except what they do in the design studio. This classification referred to supportive learning through studies for the design activities in the specific discipline. Seemingly, a major part of the studies in architectural history and theory is part of the research in the architecture that has been structured based on the reviewing of the project and redrawing on the design.

Borden and Ray (2006) identified some common problems in architectural thesis writing that they have rooted in the writing of the history of architecture based on different points of view, importantly objectivity, iconology, Hegelian approach, and politicized history. They revealed that writing a piece of research, critics, or report about the architecture is dependent on the schools of thought and style of architecture training, which form the theoretical framework of the students in thesis writing. They argued that the architecture dissertation or thesis is not just drawing or image but the words that are going to explain the project through new ideas although generally students and staff take less into consideration the writing of the idea seriously. They also criticized the perspective of the schools to limit the architectural thesis into the design. To solve the problem, they recommended a wide range of possibilities for thesis projects such as materials, ideas, projects, theories, and technology.

Oxford dictionary defines the framework in terms of 'an essential supporting structure of a building, vehicle, or object' and 'a basic structure underlying a system, concept, or text' (Oxford, 2021). Cambridge dictionary mentions 'a supporting structure around which something can be built' or 'a system of rules, ideas, or beliefs that are used to plan or decide something' (Cambridge, 2021). The Collins dictionary develops the meaning to 'A framework is a particular set of rules, ideas, or beliefs which you use in order to deal with problems or to decide what to do' (Collins, 2021). Longman dictionary defined the theoretical formwork as 'a set of ideas that are used as a basis for understanding or doing something' (Longman, 2020, p. 911). These clusters of meanings refer to key factors to design a theoretical framework. The theoretical framework is a systematic achievement of data, ideas, or beliefs through a selecting process to deal with some problem in the specific field of study of research. This redefinition of the meaning of framework could refer to the challenge of the application of the theoretical studies in the practical project based on the self-selection of the students. The important point of this interpretation of the meaning is to accept different interpretations of the students in the design process of their own theoretical framework based on the intended selection.

In a summary, the theoretical framework not only has been absent in the module description of the curriculum but also this topic less has been highlighted in the

profession (Bae, Bhalodia, & Runyan, 2019). The main objective of a theoretical framework in the thesis projects is presenting the synopsis of knowledge (Williams, 2018) in a specific topic free of presupposition and bias (Borden & Ray, 2006). This knowledge presents through integrated elements and aspects to create a whole picture of the thesis to lead the researcher to tackle the research problems (Bloomberg & Volpe, 2019). The theoretical framework is based on the personal selection of the thesis writer to include the key factors and aspects in an architectural design project. The key factors are both known and unknown (Mauch & Park, 2003) aspects of knowledge that are supposed to apply in the research process for analysis, implementation, and application. The key elements in the theoretical framework include the architectural components and subcomponents that the composition of those components create a specific style of design in the project. The architectural key components represent the common technical skills of the students, which is advocated in terms of graphical features and techniques to communicate with the juries and the readers.

Method and Materials

This section includes the methodology of the research in terms of exposing the methods in the similar research, the research design to express how the methods were applied in the research, research process, data specification, limitation and implication, and the context of the study as the time and location.

Methodology

The studies applied quantitative and qualitative methods to study the students' behaviors and education specifications (Cohen, Manion, & Morrison, 2007; Frey, 2018). Despite the advantages of the quantitative methods based on the questionnaire and big data, qualitative methods were applied widely in the case of the architectural studies (Groat & Wang, 2002; Niezabitowska, 2018; Silverman, 2004) such as content analysis (Krippendorff, 2003; Silverman, 2010), structured observation (Frankfort-Nachmias, Nachmias, & DeWaard, 2014; Tafahomi & Nadi, 2020; Tafahomi, 2020), graphical analysis (Tafahomi, 2020; Tafahomi, 2021b; Tafahomi, 2021c). This kind of research is also mentioned as a supportive system in architecture to bring other knowledge in the architecture areas for the application (Frayling, 1993).

The content analysis was applied in the built environment research such as development plans (Carmona, 2001; Lang J., 2005), policies (APA, 2006), theoretical debates (Lang J. , 1987), and even for the content of the exam and pedagogy (McConnell & Doolittle, 2012). The study revealed that all the content analysis activities include some level of interpretations in the outputs (Krippendorff, 2003). The content analysis was not limited to the text rather than the graphical features have been included in such kind of analysis (Attoe, 1979; McClean & Hourigan, 2013; Boults & Sullivan, 2010). The structured observation was applied in behavioral studies of users (Bonnes & Bonaiuto, 2002) in the built environment studies to observe the specific behaviors or reactions in the context (Tafahomi & Nadi, 2020; Tafahomi, 2021d).

Research Design

A qualitative approach (Groat & Wang, 2002; Neuman L. W., 2006; Niezabitowska, 2018; Silverman, 2010) with relevant techniques importantly structured observation and content analysis

were selected to carry out the research on the behavioral pattern of the students and staff (Tafahomi & Nadi, 2020; Tafahomi, 2021c) and the architectural thesis design products. The structured observation was applied to observe systematically the students' presentation (Tafahomi, 2021b) in the arrangement of the design boards and the staff reactions about the contents to find out the results of the studies for the development of the thesis projects. In addition, the content analysis was applied to analyze and interpret (Tafahomi, 2021e) the thesis booklet productions in terms of the summary of the lessons learnt and the extraction of the ideas through critical thinking. Through this cluster of information, the research evaluated the specifications of the application of the studies in the thesis project.

Research Process

The results of the studies in terms of the theoretical framework of the students was evaluated in both design boards presentations and thesis booklet preparation in both formative and summative assessments that calls as CAT (Continue Assessment Testing). It was asked that the students do an evaluation on the studies at the end of the section in terms of the theoretical framework based on the comparison, critics, selection of the logical ideas about the architectural thesis project. They were free to apply either text to demonstrate their own conclusion about the studies or use diagrams, tables and graphs to represent the main lesson learnt through the architectural studies. In the structured observation, the application of the theoretical framework as the results of the studies was examined through the architectural design boards' presentation by the students and the reactions of the juries. Then, the research applied the content analysis to discover the application of synthesis of the studies in terms of a clear conclusion, summary, or theoretical framework in the thesis project of the students to evaluate the key factors of the lessons learnt, which represented the architectural components and subcomponents for the design project. It was supposed that the students highlight the main architectural components and subcomponents in terms of architectural criteria and indicators for the design in the theoretical framework that was significant in their own thesis projects such as lighting, transparency, or porosity.

Data Specification

The data of the research were collected through the behavioral patterns of both students, juries, and produced materials through the architectural design boards and the thesis booklet. Data were collected through the contents and graphical presentations of the students and the attention of the juries to data in the architectural thesis design studio. Therefore, data were mentioned by the students in three major categories including texts, diagrams, and tables in both architectural design boards and the thesis booklet. The target group included 22 final year students who registered in the thesis module to fulfill the thesis project requirements for graduation.

The Context of Study

The research took place in the first semester 2019-2020 academic year, in the department of architecture at the University of Rwanda. The location of the research was arranged in the thesis design studio on the second floor of the school of architecture and built environment (SABE). The studio was included 22 thesis students in the fifth-year of the study including 3 females and 19 males.

The panel of the juries combined from the 10 academic staff six PhD and 4 master

holders who graduated from different schools of thought in architecture importantly, Polytechnique in Italy, and universities in Nigeria, and eclectic styles in Kenya, Uganda, and Iran.

The studies revealed that the schools of the through have played a significant role in the architecture education to design the courses, methods of delivery, and thesis project importantly, Beaux Art, Polytechnique, and Bauhaus traditions due to the level of art, science, and craft in the design process (Littmann, 2000; Mindrup, 2014; Madanovic, 2018; Tafahomi, 2021a). Despite the root of schools of thought in Europe, the structure of the thought in the format of the curriculum was copied, adapted, localized, specialized, and integrated into different contexts and times by the followers. For this reason, some schools of thought could be observed more predominated in some counties based on the educated people in the position of educators. Nonetheless, the schools of thought have been faced the transformation, modification, and integration based on multifactor importantly the context. The results of the process created an eclectic style that included some aspects of the schools. As an example, the study took the place in East Africa with a curriculum that was borrowed from another country in the region based on the adaptation to the context with both similar and dissimilar aspects of schools of thought in the structure of a curriculum.

Results

The architectural design boards of the students included A0 posters in the vertical format including all activities of the students such as the architectural problems statements, the design objectives, studies, and the theoretical frameworks. The students applied the graphical techniques and feature to present their studies on the drawing boards. Therefore, both supervisors and juries expected to observe the theoretical frameworks in the boards in terms of the synopsis of the lessons learnt in the study process. The students presented the theoretical frameworks with a wide range of variety.

In detail, the students presented the architectural theoretical framework in design boards importantly with three styles. The first group of students presented the theoretical framework and the architectural components in text format on the boards with different sizes, colors, and bolded words to emphasize the importance of the architectural components. Second group presented in a table format including architectural components and subcomponents but without their own logical argument about the relationships. The last group illustrated the architectural components and subcomponents in the diagram with the graphical feature to present their logic, interconnection, and importance. However, the major parts of the students applied either table format or graphical features in second and third CAT, which revealed that the students learnt through peer-presenter how they can be more effective in the presentation of the studies boards.

It was requested that the students present also their own theoretical frameworks in the thesis booklet based on the architectural topics. It was also requested to apply citation and reference for the applied sources such as online, library, or journal materials. The studio coordinator and supervisors were the person in charge to read the students products and adding comments on different drafts of thesis drafts.

The students presented the theoretical frameworks in the thesis booklet differently. First, some of the students just presented some of the precedents projects from online sources including photos and some general information. They attempted to introduce some similar projects to the thesis topic to get inspiration from those projects. Second, the students did some studies on the architecture theory and history to introduce topics in line with the thesis projects particularly due to the context and the users. However, the theoretical framework did not present separately and was integrated with studies or precedents studies. Third, this group of students presented the studies, precedents studies, and the theoretical framework in a process. However, the theoretical framework for them was a summary of the studies rather than results of a critical view. The fourth group of the students presented theoretical frameworks in the requested format and added the architectural components and subcomponents. Despite the structure of the extraction being right, the architectural components and subcomponents did not link to the studies, precedents, or logical arguments. Just one group of the students as the group fifth presented an integrated and logical structure that represented a deep understanding of the task and activity. It meant, the students did studies about the thematic aspects of the thesis project, they analyzed precedents projects to discover the important aspects of the design, and they evaluated and extracted the significant architectural components and subcomponents in the theoretical frameworks that were so important to proceed the thesis project. This group applied tables, graphical features, and diagrams to illustrate the relation between the main architectural components, subcomponents, and sources.

Observation of the behavioral patterns of the panel of the jury including supervisors, staff, and visitors highlighted that they took into consideration the theoretical framework in different ways. First, some of the members did not pay attention to the theoretical framework presentation but just the drawing parts to discover how the students redrew the precedents projects as the assimilation of design ideas. The second group observed the architectural components and subcomponents in terms of the areas of interest of the students or design objectives in the projects. Therefore, they paid more attention to the achievability of the components than the logical process of the conclusion. The third group understood the architectural components and subcomponents as key factors for the development of the projects and they attempted to question, comment, and develop the key components. Therefore, this group encouraged the students to develop the theoretical frameworks in detailed aspects of the architectural components and subcomponents to address specific actions for the design stage.

Analysis of the Results

The students perceive and interpret differently the theoretical framework and the architectural components in the process of the study and design although they have a similar training process. It means that the students take into account the architectural components in terms of either the final achievement of the design studies or the key aspects to evaluate and apply in the design process with modification. The results identify that the students have their own interpretation and understanding of the theoretical framework and the architectural components and subcomponents and they personalize and specialize it for their own purposes. The understanding of the students about the

theoretical framework could be classified two levels and in four key aspects including sets of information, application of data for analysis and design, the way of presentation, and technique for communication in thesis studies. Figure 1 show this relationship.

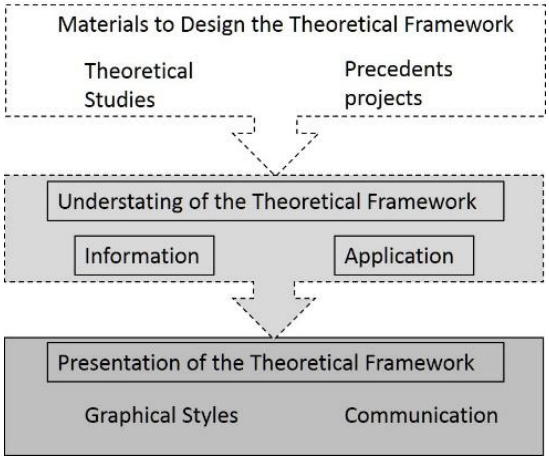

Figure 1: *the key aspects to demonstrate the theoretical framework*

The students demonstrate different clusters of information as the lessons learnt through studies with the specific purpose of the application of the architectural elements and components in the design process. They arranged the architectural components, subcomponents with the references and years of the publication as the essential information in tables to support their achievements and to enhance the level of connection of their design proposal with the current architectural theory and practices. The students also apply tables, diagrams, figures to illustrate the importance of the achievements in the study process. These techniques attempt to represent their own information about the essential and key factors in architectural studies in relation to the thesis topic.

The students also understood the theoretical framework as a repository to collect data through studies to apply in three stages such as data, analysis, programming, conceptualization and design. The students presented the key criteria in the way to show earlier findings as the lessons learnt through of the students although some of the examples of the presentations referred to the analytical activities projected to do in the analysis stage. Nonetheless, important aspects of the presentation by this group of students demonstrate the application of data in the design process than the information itself. For this group of students, the studies provide the rough material for the activities in the thesis process. They observe the architectural components as important factors that are supposed to adapt to the design project through examination and evaluation. This approach helps them to keep study, research, analysis, and transformation of the architectural components to the projects (Figure 2).

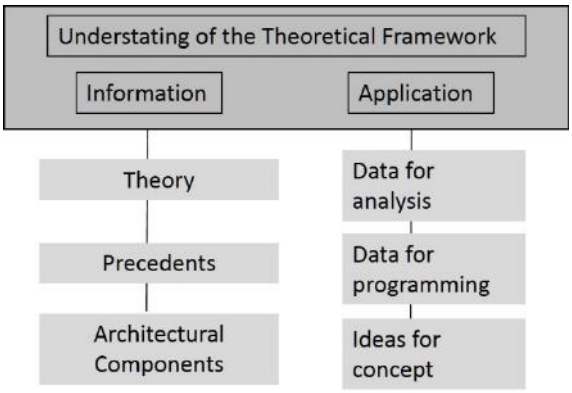

Figure 2*: Two styles of Understanding of the Theoretical Framework*

The students applied three techniques to present their own understanding of the theoretical framework in both the boards' presentation and the thesis booklet including graphs and diagrams, tables and texts, and sketches and photos. They used the graphs and diagram as a template to fill by the studies and the precedents studies. Those diagrams demonstrate that the students were familiar with the linear and the hierarchical diagrams more than other

formats. The table is a common way to summarize the information in terms of their own understanding of architectural studies and the precedents projects in the table. The table included the name of the architectural elements and components, detailed aspects, and source of data. In the third technique, the students prefer to show their understanding of the theoretical framework.

Those techniques create opportunities for the students to communicate with the jury, peers, and self. Any style of presentation makes a particular way of communication with the participants. The students learnt to improve the presentation and techniques through the comments of the jury. This communication not only improved the presentation of the students in the next critics' time but also helped the student to understand the important points of their own works based on the critics and comments, and discussions. This process increases the level of self-understanding of the architectural project by the students directly. The communication also includes some indirect effects on the students' presentation and communication through observation of works of other students. The students learn continuously from previous experience to perform better in the next presentation. In fact, the feedback of the juries and other students lead them to do a self-evaluation to enhance the quality of the presentation and communication for the lessons learnt in the architectural studies phase (Figure 3).

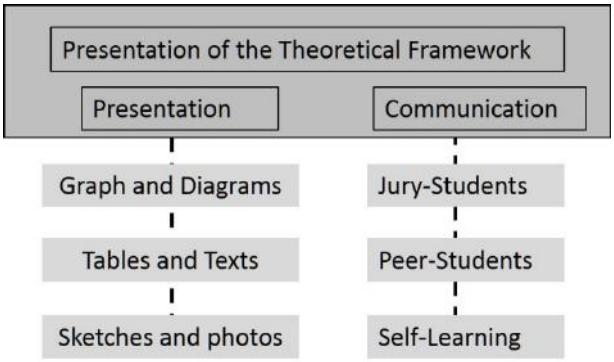

***Figure 3**: Presentation of the theoretical framework*

Discussion

The results of the research identified that the students took into consideration the meaning of the theoretical framework as either a learning achievement or rule to plan how to deal with the architectural problem in the line with some definitions (Collins, 2021; Cambridge, 2021). Despite the instruction of the thesis referred to the criticizing and evaluating of the facts and data, the students applied the theoretical framework based on their own selection that the results were in the opposite of the finding of (Williams, 2018; Bloomberg & Volpe, 2019) as critics. The students presented more what they have known in the process of the studies than questioning the missing aspect of knowledge as unknown matters (Mauch & Park, 2003). Therefore, the students followed the methods as mentioned synopsis and summary (Williams, 2018) of the information in a logical process.

The students applied both content analysis and interpretation (Krippendorff, 2003; Borden & Ray, 2006) in the presentation of the theoretical framework. Despite the absence of the critical point of view in the presentation of the students, they applied summative, integrated, and related sources (Bloomberg & Volpe, 2019) to support their idea about the architectural components in terms of reflection of the

lessons learnt (Williams, 2018) to deal with the architectural problems (Borden & Ray, 2006), studies (Cohen, Manion, & Morrison, 2007), and conceptualization (Tafahomi, 2021b). The students preferred to exemplify the studies through images and graphics to refer to the precedents studies as the lessons learnt without differentiation between of the research 'in or for' architecture that advocated by Frayling (1993). It means that the students applied different approaches to discover their own theoretical framework than a structured research process (Tafahomi, 2021a). They also were so interested in precedents studies than theoretical topics (Borden & Ray, 2006) in the presentation that made their works more graphical than critical.

The students learnt continuously through their own presentation and communication to improve the theoretical framework that this achievement of the research has been less discussed by the studies (Bloomberg & Volpe, 2019; Borden & Ray, 2006; Tafahomi, 2021a). Although the studies revealed and advocated a linear process between the studies and the students to select, integrate, and present the results of the studies, the findings highlighted that the students were learnt through following the peer-learner in the presentation to borrow data and styles for effective communication (Frey, 2018; Tafahomi, 2021b). The results identified that the students improved information, application, presentation, and communication in a circular process that observing of design board presentation of other students was so effective in this process.

Conclusion

The students personalize instructions in the learning process to discover the most effective style for their achievements. They demonstrated four specifications including information, application, presentation, and communication to develop the theoretical framework in the thesis activities. Although it was requested from the students to extract the significant architectural components and subcomponents to present their own theoretical framework due to the instruction, the students reacted differently. The information in the theoretical framework is included in a spectrum of meanings and purposes for students to present their studies, interest areas, key factors, elements, or technology. This differentiation demonstrates that the students understand, interpret, personalize, and specialize the learning objective with a wide range of variety. Nonetheless, the theoretical framework and the architectural components and subcomponents consumed much more time from the students and it needs to take into consideration for the thesis modules.

The exercise could draw a strong link between the architectural studies and other stages in architecture design studios and particularly the thesis project importantly the analytical and conceptual phases. However, the students personalize this step in their own way of understanding of the thesis project. Therefore, the exercise demonstrates varieties of understanding, interpretation, presentation, and communication due to the theme of the thesis project, sources of the study, graphical ability, and priorities. It could increase the possibility of the differentiation and verities particularly when the students have different panels of the jury to evaluate the design boards' arrangement. Although the students presented the theoretical framework differently, participation in the presentation of other students inspires them to pay more attention to the

presentation, communication, and interaction with the panel of juries. This participation provides an opportunity to learn directly and indirectly from both positive and negative aspects of the presentation of other students to improve their understating.

However, the application of the results in the department with the traditional style of the final year project could limit the achievements of the theoretical framework learning outcomes. In some departments, the instructors prefer to follow the traditional style of activities particularly redrawing from precedents studies in terms of the final project. This style results in minimizing of activities of the students in thesis study such as less study on the theoretical aspects, separated theories, and without criticizing the current knowledge. Perhaps, effective instructions for the theoretical framework in the thesis module could lead both staff and students to restructure the thesis learning outcomes based on the critical perspective, exploration of the unknown, and integration of point of view.

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Using a Brand Identity-Focused Project Structure to Improve the Competencies of Product Design Students

Bulent Unal
Atılım University, Ankara, Turkey
H. Merve Demirci
Atılım University, Ankara, Turkey
Middle East Technical University, Ankara, Turkey
Emrah Demirhan
Atılım University, Ankara, Turkey

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B. Unal ORCID: 0000-0003-1721-7903, H.M. Demirci ORCID: 0000-0002-0315-5898, E. Demirhan ORCID: 0000-0001-8851-7765
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Abstract: It is essential to reflect the strategic connotations of the brand on the products while creating and developing a product design that fits the brand identity. Therefore, for a company, it is a critical issue to place the right messages that support the strategic brand identity in the design elements. From the designers' point of view, they are expected to have design skills such as analyzing a brand's uniqueness and brand knowledge and reflecting the results of these analyses on the aesthetics, function and overall meaning of the product. For this reason, as a part of the Industrial Design curriculum, brand identity focused product design has been restructured in Atılım University, Industrial Design program. In this studio course, the aim was for design students to acquire skills of brand identity and product identity analysis, in addition to basic design knowledge and skills. During 16 weeks, the data were collected by doing a participant observation and conducting semi-structured interviews with the course students. The data gathered from the semi-structured interviews and participant observation were analysed by using an inductive coding approach. Thus, product design suggestions that were suitable for the identity of the brand were analysed with the questions asked by the instructors during the design process. The results show that the questions asked by the instructors and the examples they gave, led the students to research, think, question, understand and make sense of the importance of information. As a result, the students obtained design outputs suitable for brand identity.

Keywords: Design Education, Product Design Education, Product Design, Brand Identity, Analysis of Brand Identity

1.Introduction

The semantic dimension of product design is becoming more critical in advanced product categories where technical differences between products are diminishing. Product design also shifts towards communicative product attributes that represent the symbolic domain of the product (Karjalainen, 2003a; Stompff, 2010). In other words, product design can be used as a manifestation of brand identity.

Placing strategic associations in products is essential when creating and developing product design that fits the brand identity (Karjalainen, 2003b). Brand identity-specific

product design can be regarded as the intersection of product semantics and brand research. In advanced product categories, where technical differences between products are reduced, the focus shifts to communicative product attributes representing the product's symbolic domain (Karjalainen, 2003a). In other words, communicative qualities are often intertwined with a specific set of meanings that refer to the brand represented by the product (Homburg, Schwemmle, & Kuehnl, 2015). Therefore, for a company, it is a crucial issue to place the right messages that support the strategic brand identity in the design elements.

Numerous research results (Greenberg et al., 2020; Heitmann et al., 2020; Homburg et al., 2015; Kreuzbauer and Malter, 2007; Stompff, 2010; Wang et al., 2008) show that as competition becomes more intense than ever, product design becomes increasingly important to firms. It has become an essential strategic tool that they can use to gain a sustainable competitive advantage (Page and Herr, 2002). However, the aesthetic forms of products are not the only factors that affect consumers' product perception and purchasing decisions (Heitmann et al., 2020; Homburg et al., 2015). In addition to the forms of the products, the functionality and symbolism dimensions of the product design also have a decisive effect on the differentiation of products from their counterparts (Homburg et al., 2015).

From the designers' point of view, designing products that align with the brand's strategically defined message requires specific product knowledge (Warell, 2015). This is the recognition and identification of specific brand identity references in product design, in other words, the analysis of brand-specific design language and the reflection of the three dimensions of product design, aesthetics, functionality and symbolism, to design (Warell, 2015; Maurya and Mishra, 2012). Therefore, to transfer meaning through product design, product designers must place an association reference in the products they design and recognize and define the identity of the brand's products (Slade-Brooking, 2016; Warell, 2015; Karjalainen, 2003b).

Product designers working in the industry are expected to analyze a brand's uniqueness and brand information to reveal visually consistent designs in product design processes and to have design skills such as reflecting the results of these analyses to the aesthetic, function and semiotic meaning of the product (Naletelich and Spears, 2020). During their education, design students try to acquire skills such as brand identity analysis, product identity analysis, corporate identity creation, and basic design knowledge and skills to design outstanding products for their companies. These knowledge and skills have to be the skills that designers learn during undergraduate design education. For this reason, as a part of the Industrial Design education curriculum, brand identity focused product design has been restructured in Atılım University Industrial Design program with the process models applied in product design studio courses.

The need to align product design studio training with the skills required to design products that reflect brand identity relates to the process models applied in structuring product design studio courses. The design process in the studio was 14 weeks of consecutive brand and product identity analysis that is structured to focus on visuality, aesthetic perception, functionality and symbolism. The course instructors foresaw that the design of brand identity-oriented products might require a different approach in terms of product design studio training, and preparing product design students for the future was questioned in the focus of product design education throughout the semester.

This article will first review the literature describing strategies/methods for training product design students to analyze/reflect brand identity. Then, a different project setup applied in the third year product design studio course; product design for a selected science fiction film, product design for a brand assigned to each student, which is not included in the product range of the brand, and product family design specific to the same brand. Finally, the research findings are shared with comments and possible implications for

product design education. The study concludes with an indication of potential areas for further research.

2. Product Design Education and Design Studio Projects

In the curriculum of the Atılım University Department of Industrial Design, the design studio courses are accompanied by compulsory courses that provide students with detailed theoretical and technical knowledge and skills. In the product design curriculum, there are must courses regarding visualization and modelling techniques, including freehand drawing techniques, technical drawing, model making and computer-aided 3D modelling; and materials knowledge, production techniques, ergonomics, user research, marketing, design management, design history, and cultural and critical aspects of design. The design education curriculum also includes a wide range of practical and theory-based area electives that offer specific skills, knowledge and experience.

Design studio courses are essential elements of industrial design education(Mukherjee, 2021; Demirbilek, 2004). Students take these courses for 10 hours per week each semester, and these design studio courses aim to provide vocational training through practice. Students try to reflect on what they have learned about design in other required courses during their studio project. Each semester, students are expected to complete several design projects aimed at gaining different knowledge and skills as they progress through the design program. At the end of each project, the learning outcomes of the projects are evaluated and interpreted by an open jury composed of lecturers and practitioners or professionals.

First-year studio courses are reserved for Basic Design, in which the basic concepts of design are introduced; visual perception and creative thinking, abstract and conceptual applications, understanding basic material information, and evaluation of the given design problem from different perspectives. As a result of learning the basic design principles and design terminology in this studio course, students are expected to have a little difficulty understanding the information that the instructors will convey to them in the following studio courses and transferring them to their learning processes.

The second-year Industrial Design studio course projects are related to ergonomics, human-product interaction style and redesign. Design projects in this class focus on the functional requirements of products while encouraging systematic thinking and scenario creation. In the third year, Industrial Design studio projects often focus on questioning brand identity, product identity, system designs, designs covering new technologies and technological applications, innovation, user interaction, product language and aesthetics. Lastly, in the fourth year, design studio courses continue with a focus on collaborations with different sectors, including the design field. With this approach, it is aimed that our students rehearse their professional life before they graduate.

The topics discussed in the rest of the article are the fifth semester (third-year first semester) Industrial Design studio project structure and the student achievements targeted with this setup. The detailed studio course plan for the relevant term and the achievements aimed for the semester are explained below.

3. Research Method

To test the possible impact of different design approaches on design students' experience of designing brand identity-oriented products, a new course structure was implemented with fifteen students in the first product design studio of the third grade in the fall semester of 2020-2021. The studio course is structured (see Fig.1) for design students to design four different brand identity-oriented products with three different strategies defined according to the management and structure of the design process. This teaching strategy aims to raise more discussion about the methods/strategies used in the studio environment to design brand identity-focused products as trainers.

Four instructors gave the design studio course together, all of whom are experts in product (industrial) design. There were fifteen students enrolled in the design studio course in the fall term of 2020, and they met twice a week for sixteen weeks. Each design studio course lasted five hours and was structured to design four different products (with two product options) by conducting three distinct brand identity focused design projects.

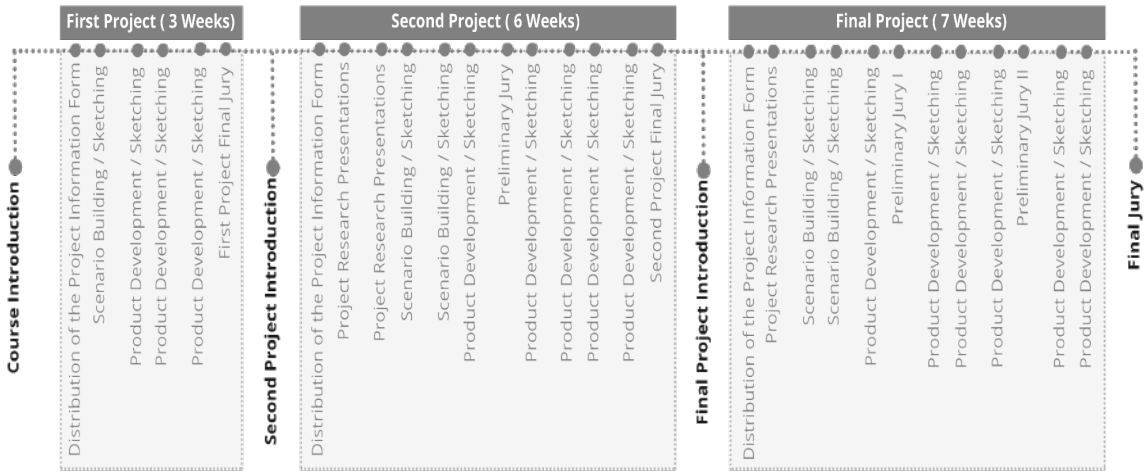

Figure 1: *2020-2021 fall- third-year first-semester design studio course structure*

First of all, for the first project (the first three weeks), the students were asked to design a product that would fit a scenario that does not have a real-life counterpart. For this purpose, students analyzed the scenario and visual identity of a science fiction movie (TRON: Legacy) whose product design language is dominant. Subsequently, they designed different concept products with aesthetic concerns that would fit a design problem they determined, the fiction and design language of the movie.

In the second project (6 weeks), the course instructors determined fifteen different brands they used or encountered in real life, and each student was matched with a brand. In the brands selected for the second project, the chosen product that was designed was not being in the product range of the given brands has been an important brand selection and filtering criterion. Students, each paired with a different brand, started with brand analysis research in six weeks and designed a new product with the visual identity of that brand. In the last project (7 weeks), the instructors determined two different products, an electric toothbrush and shaver/epilation device, to design and form a product family of the same brand.

The data were collected through two main methods: participant observation and semi-structured interviews. Throughout the semester, participant observation was used to observe the students' design process in the studio. During this process, field notes were taken. Semi-structured interviews were conducted with each student at the end of the semester, and each interview lasted 20 to 25 minutes.

The collected data were interpreted by comparing them with the field notes taken during the observations. Data analysis was done with an inductive and deductive approach to describe students' experiences with the three processes. In addition to data from observations and interviews, students' design solutions for each project were analyzed based on content and integrity.

4.Design Studio Project Processes and Evaluations

As the first step to analyze the different design approaches applied in brand identity-oriented design projects, the students' design process in the third-year design studio was observed. To make appropriate inferences about the subject, it was aimed to document and observe the students' design processes and reveal the prominent results of the study. For this reason, firstly, the process outputs obtained from the observations, and then the results of the product design projects focused on brand identity are explicitly explained for the projects. The chapter ends with the discussion and evaluation of the findings of the project processes.

In this study, the design processes followed by the students in all three projects, sample design suggestions and observation outputs were shared. The projects and their output sequence is discussed in parallel with the design studio courses structure.

4.1. Visual Identity Focused Design Projects (3 Weeks)

The first project of the term was built on the concept of visual identity, which forms one of the foundations of the brand context for three weeks. The project process started with watching a science fiction movie, TRON: Legacy.

TRON: Legacy (Kosinski, 2011) was chosen for the first project due to it is being distinguished from other films in its genre with its design language and editing. In the making of the film, designers from different fields had worked collaboratively to create the visual image of the film (Kosinski et al., 2011). The reason behind starting the first project with a science fiction film focused on visual identity is to detach students from the realities of the world they live in, from the codes they know, and immerse them in a well-defined fictional universe.

After watching the movie, the students started to make sense of and analyze the visual language and technological infrastructure of this movie. In the first research sheets presented, it was seen that the students only used the screenshots they took from certain scenes of the movie without thinking much. To better understand and analyze the visual language of the film, the students were asked the reasons for choosing the products they have suggested to design during the design critiques. Thus, the instructors assisted them in deepening their analysis methods through different examples. After analyzing the visual language of the film, the outputs obtained from the analysis were visualized again with the help of freehand sketches and graphic programs and presented by the students.

In the presentations of the design proposals that came after the analysis of the film's visual language, it was observed that the students had difficulty in putting forward a product idea that fits the language and fiction of the film. The habits they have developed in the previous periods, the students left aside the analysis outputs they made about the visual language of the film and focused primarily on designing the physical products whose names they indicated. At this stage, the instructors who gave the course made the students question the relationship between the design suggestions they presented in the in-class critiques and the analyzes they made. It has been tried to explain how and in what way this aspect is missing in the design proposals.

During the three-week project period, the instructors criticized the students for how well the form of the product they designed was suitable for the visual and symbolic language of the film and how accurately it reflected the fictional and technological structure of the film. In addition, throughout the design process, it has been repeatedly observed that students have difficulties transferring the analysis outputs they have revealed during the research process to the idea development stage. The analysis skills demonstrated by the students during the project process were developed by criticizing them. As an example, as seen in Figure 2, products that fit the language and fiction of the film were designed. In addition, students' difficulties in transferring

Figure 2. *First Project Final Output (Student: Egehan İncecik, Product: DJ Setup)*

knowledge and skills between studio course design processes negatively affected their project time management. A student supported this observation output in his interview as follows;

> *"... ...in fact, I couldn't decide which design proposal to advance. I thought all of the design suggestions that came to my mind were suitable for the film, you know... then, ı thought, "now the time is running out, so I must choose one and start a design process". I actually decided at one point so that the design process could end."*

In the process, time planning and product design skills reflecting the film's identity were developed, and at the end of the process, the students' ability to analyze, create and transfer visual identity through science fiction films developed. Thus, the ground was prepared to reinforce these skills in the second project with brand identity-oriented product design. Another student summarized this design project as follows;

> *"Let me open the movie to the point where I get stuck, watch the scenes that inspire me repeatedly, or design a product for which scene... It was fun for me to try to empathize by developing a project with a movie, with the characters in that universe. Overall, I can say that I enjoyed the process."*

In the end, while commenting on the first project, the students emphasized that it was enjoyable to look at the movie frequently at the point where they get stuck and to try to empathize with the characters in that universe with a movie.

4.2. Brand Identity Focused Design Projects (6 Weeks)

In the second project, the students were expected to analyze the brand identity (visual identity, target user group) and the ability to transfer it to their product designs.

After three weeks, the second project started when the instructors decided on a hairdryer to be designed. Since the project aims to achieve a brand-focused design process, a hairdryer, a product with as few components as possible, was chosen to prevent students from concentrating on its details. In this way, the students have focused on the product-brand relationship.

The course instructors determined fifteen brands that do not include hair dryers in their product range, then the students were matched with the brands by drawing lots, and the students' research process started. The reason for selecting a product that is not in the product range of brands is to prevent students from taking the applications of the brand on an existing product as a preliminary acceptance and producing a similar outcome. Thus, the students were expected to gain the ability to perceive the target user group of the brand, the symbolism used to communicate with this audience, and the visual reflections of this symbolism in the products of the brand, and to reflect what they perceive in the design of a different outcome.

There were deficiencies in transferring the analysis skills experienced in the first project to the second project. In the brand identity research, it was observed that, except for a few students, the students tried to understand and explain the brand without overthinking about the products belonging to the brands. The research tried to ensure that the brand analysis process progressed more accurately by guiding the students who included the areas that constitute the brand's identity, such as the area where the brand positions itself, its goals, and the target user group.

In the research phase of the project, after the students researched the brands and their target user groups, they started to design hair dryers independent of their brand's identity, as was experienced in the first project. Observing the repetition of the situation in both projects revealed a disconnection between the design process's research and idea development stages. In this case, the students had to be guided through the critiques to make identity analysis and reflect the analysis outputs. The students, who conducted the analysis phase well in the process and successfully transferred the brand's identity to the product design ideas, showed good progress by trying and eliminating many design proposal alternatives (Figure 3).

> *"There is an imagination-oriented structure, but there is a product output that we embody. The transition there… I believe it was an exercise we had to do as designer candidates. I think it was beneficial."*

In the evaluation phase, the final product and the process that has been experienced are discussed in line with the expected acquisitions, as in the previous project. The brand analysis process, the outputs revealed in the process, the reflection of these outputs on the products, the consistency to the products'

Figure 3. *Second Project Final Output (Student: Ümithan Üçok, Product: Hairdryer for Rolex)*

functional context, and the manufacturability criteria are taken into consideration in the evaluation.

4.3. Brand Identity Focused Product Family Design Projects (7 Weeks)

In the seven-week final project of the term setup, it was aimed that the students understand the concept of product family on the knowledge and skills in the context of visual identity and brand identity, which they gained from the first and second projects. Thus, they achieved the ability to create product family unity in the focus of brand identity with the approach they display within the framework of this concept.

The project structure was carried out by designing two new products for the family of the relevant product without changing the brand and product that was worked on in the second project. In this way, students reinforce the related brand identity work with two new products and gain skills on product family design. One of the purposes of designing two new products in addition to the product designed in the previous project was to develop the other two products in the context of a product created by them after the concept of the product family was perceived. Another aim was to help students discover how this symbolism can be reflected in the product family and which approaches can be used alongside family unity.

The project started with the research and presentations made by the students in line with the analysis of the product family. In this project, it was observed that instead of examining the concept of family, the students included diverse product samples and carried out the research in this way. With the critiques, clues on how to conduct research on the concept of product family were given to the students, guidance was given in this direction, and it was seen that the students were able to reach the expected level of analysis.

The difficulty experienced in the transfer of the analysis phase to the idea development phase in the second project continued in this project. By continuing the habits they gained in the previous project courses, the students tried to develop individual products independent of the identity of the brands and the concept of family. This situation negatively affected the students' process management, making it difficult for them to transfer brand identity and

Figure 4. *Third Project Final Output (Student: Bora Altay, Product Family: Hair Dryer-Electric Toothbrush- Hair Removal Tool for Vespa)*

product family analysis to their products, preventing them from developing different design proposals. The instructors of the design studio course guided the students with the questions they asked and the tips they gave, and they guided the students about process management. One of the remarkable observations is that the students tend to reconsider their product suggestions from scratch due to the received critiques. As a result, the students, who handled the analysis phase well, assimilated the family unity and made various attempts to transfer the brand identity and family concept to their products and achieved successful results. The students' comments about this project process reinforce that the objectives of the process have been achieved successfully.

> *"I felt like the designer of that brand for thirteen weeks…"*

During the evaluation phase, the product designed in the second project was excluded from the evaluation as a grade. This stage was carried out on two products that were designed as a part of the product family. Evaluation criteria were how much the product family concept is perceived, how much the reflections of this concept is reflected in the designed products, and how much the brand identity can be read in new family members.

4.4. Evaluation of Brand Identity Focused Design Projects in the Focus of Design Education

An inductive coding technique was used to analyze the data collected from the semi-structured interviews and participant observation. The codes obtained from the gathered data are illustrated in Figure 5 and tried to be explained by using direct quotations from the interviews. The analysis indicates that product design concepts that were appropriate for the brand's identity were scrutinized using the questions asked by the instructors during the design process. The findings also reveal that the instructors' questions and examples prompted students to explore, reflect, question, comprehend, and make sense of the relevance of knowledge.

During the fall semester, it was observed that students had difficulties in certain aspects while designing physical products with the focus of brand identity. The lecturers led the students to research, think, question, understand and make sense of the importance of knowledge and take responsibility with the questions they asked and the examples they gave during the design project processes. When students were not otherwise guided, they tended to begin straight to the design of their named physical product. However, in the end, the students succeeded in making brand and

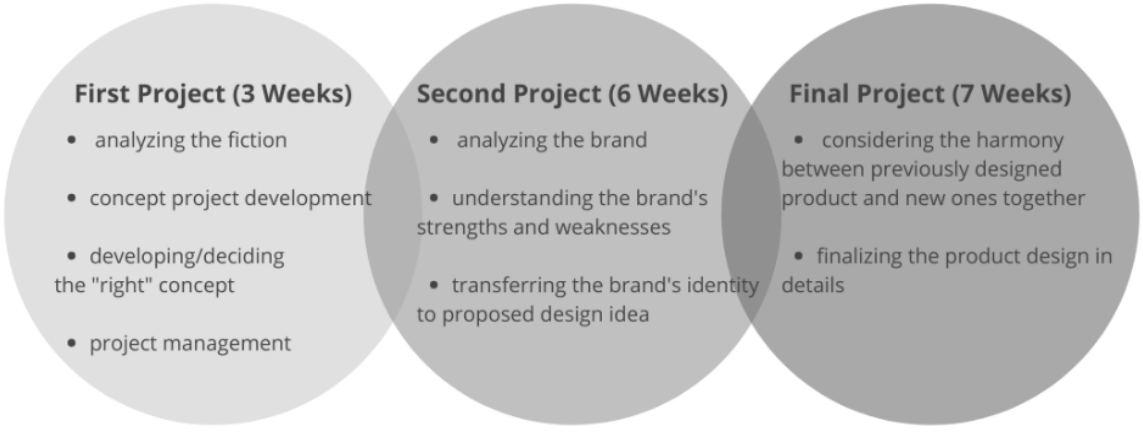

Figure 5. *Repeated Comments from the Students' Evaluation of the Semester*

product analyses and obtaining design outputs suitable for the identity and character of the brand.

At the end of the semester, students made constructive comments about all three projects and, as designer candidates, shared the positive effects of this process on them with the following statement:

> *"This was a delightful process for me as well; this period may be my favourite period because you will always work in a brand… you will understand the identity of that brand and design a product belonging to that brand, to illustrate, if you work at Vestel, the product you design should reflect Vestel's general product language, or even when you establish your brand in the future, you will still have to have a brand identity, and you will have to develop it. In that sense, it was a process that I enjoyed."*

In their interviews, the students chose the first project as they had the most difficulty with it while analyzing the semester. They mentioned the difficulty of designing a product that does not have a real-life counterpart and carrying out a project following the visual language of a world designed by others as their difficulty in the first project. Furthermore, the students said that the analysis of the science fiction film, which will prepare the ground for design decisions and determine the identity of their designs during the first project process, continued throughout the project process.

Unlike the first project, many students emphasized that the time allocated for research in the second project was sufficient, while a few students stated that this process continued until the last week of the project. Predominantly, after students researched brand identity and product identity, their efforts to develop product design ideas independent of brand identity and brand lines were followed in the idea development stage, leaving the research outputs aside. With this orientation, some design stages were repeated. Thus, in the second project, understanding and establishing the brand identity was the most important and challenging stage of the project according to the students. Unlike the first project, many students emphasized that the time allocated for research in this project was sufficient, while a few students stated that this process continued until the last week of the project.

They also expressed that they did not have experience with a similar project setup in their previous studio courses, therefore they had difficulty in analyzing a fiction prepared by others. Thus, the students underlined the outcomes of educators' observations by stating that the unsuccessful time and project management were indirectly caused by this inexperience.

The reasons for the difficulties mentioned by the students in the second project overlap with the observation results. The results of the interview data revealed that the students had problems in analyzing the brand identity and target audience of the brand. In addition, they mentioned that the symbolic analysis of the brand paired with them was considered idle time.

> *"My brand was a brand that I was not very familiar with. Since it's a brand topic that I don't know about and is out of my area of interest, I researched it even more deeply. That project improved my research thing quite a bit. It was an unfamiliar subject and a challenging project... I researched as much as I could. Whether it's visuality or production, it prompted me to research quite a bit. Also, since the brand did not have such a product, there was nothing I could take as an example. For example, when I typed premium hairdryer on the internet, almost nothing came out. That's why I devoted myself entirely to researching that brand. I researched the history of that brand, how they were made, what made it that brand… After learning these, I felt as if I had solved his algorithm. Things got more manageable for me later, but I had to change my mindset while researching; it forced me."*

On the other hand, one of the common comments for the second and final projects was that determining the production details of their design both challenged and excited them. The reason why it was interpreted as difficult was stated that the production methods and the material they chose did not match with the form they presented, so they had to make revisions by considering both contexts together in the process. These responses are reflected in the observations of the educators as they provided students with important feedback that guided their next design decisions, according to how close they had come to the identity of the brand assigned to them in their previous projects.

The results of the interviews showed the final project was the most straightforward project. During this project, the students were able to use the knowledge and skills they gained in the first two projects in the last project.

> *"Here it was easier as it was like a continuation of the second project. First, we researched the product family. The brands always have a product family. I researched what I could make a product family with the product I designed and what I could use in common. I progressed by building on the previous one; it was not difficult because we laid the foundation before."*

According to the students, this semester's structure encouraged them to generate design ideas that are transferred for the appropriate user group and products to which well-analyzed and understood under the assigned brand's identity. Thus, most of the students stated that they understood that even designing a product family can be a design problem. In addition to this, it has been expressed as quite challenging to establish common lines between different products that fall under the same brand's identity.

Overall, students described their semester experience of brand-focused design projects as excessively illuminating for their future experience. Some students frequently used adjectives such as "enjoyable" and "educative" in their interviews. All students stated that they understood what kind of design process awaits them in the future, as a result of this semester's structure.

5.Conclusion and Discussion

When the existing studies were examined, it was seen that there are design studio course setups focused on training industrial design students for the product design sector (Egan, 2021; Parmentier et al., 2021; Swanson, 2020; Meyer and Norman, 2020; Redström, 2020; Frascara, 2020). This article aims to discuss the importance of designing with a focus on brand identity and sharing the findings from a one-term experiment and practice in the design studio course. For this reason, it has been examined how the knowledge and skills defined during a semester are handled in the structuring of a brand identity focused studio course.

As mentioned in the article's introduction, different product design stimuli such as a brand's perception of identity, various visual form elements or colours are processed at different stages of the perception process (Slade-Brooking, 2016; Warell, 2015; Karjalainen and Snelders, 2010; Karjalainen, 2003b). Among the three design process setups implemented for 14 weeks, it was preferred by the lecturers to design a new product by reflecting the brand identity to the design proposals simultaneously from the idea development stage. In product design projects focused on brand identity, since the needs and habits of the user group include a mixture of the symbolic and functional components of the product, it is necessary for students to understand the perception of form-brand association and how design is based on this.

According to Warell (2015), consumers who are aware of two products of a particular brand can imagine what the third one looks like with the help of the brand's visual identity. It is also stated that a brand can be defined as forming its identity using the design of its products, occurring through symbolic, indexical or symbolic sign references (Warell,2015;

Stompff, 2010). For example, similar visual form elements or design cues are consistently transferred to product designs, creating brand recognition. In contrast, brand or product associations such as sportiness are created through symbolic references in designs (Warell,2015;Stompff, 2010; Karjalainen & Snelders, 2010).

The specific experience in this design studio course is based on a practice in the studio with a limited number of students. Although the small number of students is an advantage to better interact with each student, repeating these practices with larger groups in the future will yield different results. Also, in the future, it may be more valuable to ask students to reflect on their design process throughout the semester and to collect data by helping them keep design diaries throughout the process. Product design studios' primary motivation and aim will be to enable students to think for themselves, question, learn to access information, and reach the product by internalizing the design processes while working on projects.

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The Interpretation of Graphical Features Applied to Mapping SWOT by the Architecture Students in the Design Studio

Rahman Tafahomi
Department of Architecture, School of Architecture and Built Environment, College of Science and Technology, the University of Rwanda, Rwanda

Reihaneh Nadi
Independent Researcher, Rwanda

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R. Tafahomi ORCID: 0000-0002-7172-1302, R. Nadi ORCID: 0000-0002-8005-7028
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Abstract: The purpose of this study is to gain an understanding of how the architecture students deploy a range of graphical features to visualize SWOT, standing for Strengths, Weaknesses, Opportunities, and Threats. Architectural design studios provide students with a range of analytical techniques, and SWOT analysis is considered to be useful and effective, particularly at urban-scale design projects. However, it is a text-based framework and needs to be converted to thematic analysis maps across architecture and design fields. The main issue is that the determining factors affecting the way in which students choose graphical features to map the outputs of SWOT analysis is unclear at architectural design studios. The research employed qualitative methods, specifically observation, focus group, and graphical analysis, to examine SWOT maps produced by the architecture students. The findings demonstrated that the selection of graphical features in the process of producing SWOT analysis maps are dependent on scale of study (macro, meso, and micro), as well as location, spatial connection, and size of elements derived from SWOT matrix. For instance, lines and planes were most frequent features at macro level while the variety of symbols remarkably increased at micro level. In conclusion, the students personalized the process of mapping, meaning that they applied point, line, plane (shape), color, texture, and typography in several different ways. Therefore, SWOT analysis not only help architecture students to better understand the problems of their design projects, organize and consolidate information, and visualize opportunities and constraints, but could lead to the representation of realistic solutions in an innovative way.

Keywords: Architectural Design Studio, Graphical Features, Graphical Techniques, SWOT Map.

Introduction

Graphical techniques are applied to the process of analysis and presentation in built environment studies, particularly in academic settings such as studios and classes (Moughtin, Cuesta, Sarris, & Laurea, 1999). The fourth-year architectural design studio focuses on urban and pre-urban scale projects in the bachelors program, department of architecture at the University of Rwanda. Both students and instructors apply relevant methods and techniques with the architectural research and urban scales in the studio to meet the learning objective of the course (FAED, 2009). Architectural design

studios include a variety of methods and techniques such as architectural research methods and approaches (Faryling, 1993; Groat & Wang, 2002; Moughtin, Cuesta, Sarris, & Laurea,1999) behavioural sitting (Zeisel, 1984; Bonnes & Bonaiuto, 2002), sociology and interaction between groups (Altman & Chemers, 1984; Madanipour, 1996), economy aspects (Carmona, 2001), politic (Tschumi, 1997), public and private relations (Alexander & Chermayeff, 1965; Madanipour, 2003), and urban environment and sustainability (Thomas, 2002).

SWOT (Strengths, Weaknesses, Opportunities, and Threats) tends to be deployed in design studios, particularly in urban planning, urban design, and architecture for research, analysis, and policymaking. It has its origins in business and management fields, going back to 1950s (Sevkli, Oztekin, Uysal, & Torlak, 2012). However, this technique should be closely aligned with objectives, outputs, and processes of studios such as drawing, analysing, conceptualising, and designing.

Problem Statement

SWOT analysis is considered to be useful in a range of fields such as science, business, technology, urban and regional planning and design (Moughtin, Cuesta, Sarris, & Laurea, 1999; Ercoskun, 2012). Raw data can be collected through other methods and techniques such as content analysis (Krippendorff, 2012), structured observation and site analysis (White, 1983; Moughtin, Cuesta, Sarris, & Laurea, 1999; Groat & Wang, 2002). The studies highlighted that the outputs of SWOT are a little far from both graphical methods (Dandekar, 1988; Laseau, 2000; Lawson, 2005), and the research by design approaches (Faryling, 1993), meaning limitations on applications of SWOT in mapping processes (Ghazinoorya, Abdia, & Mehrb, 2011). As a result, SWOT analysis needs to be adapted to suit the graphic representation architectural design studios.

SWOT is normally a text-based technique (Pavelsky, et al., 2014) with a few details about locations as a reference point (Lee, Yuan, Jung, & Beighley, 2015), which could cause deficiencies (Ghazinoorya, Abdia, & Mehrb, 2011; Tafahomi & Lamit, 2011) in analysis stages such as site reconnaissance, site analysis, observation, and mapping. However, architectural design studios are mainly based on the graphical styles (Moughtin, Cuesta, Sarris, & Laurea, 1999) including sketching, drawing, mapping, and design (Laseau, 2000; Groat & Wang, 2002) to refer to a specific location. According to the importance of accuracy and level of precision data in the analysis phase, students have to produce maps based on the location using graphical techniques (Taketa, 1996) as a hybrid approach (Kurttila, Pesonen, Kangas, & Kajanus, 2000) to fit with architectural design studios. Seemingly, the text could create generality rather than specification with a reference point.

Although Moraes et al. (2014) introduced SWOT as a process of mapping and demonstrating documents, another study criticised the application of SWOT as an inappropriate tool to present data such as location, scale, size, and form by architecture students (Harwood & Rawlings, 2001). This specification of SWOT has affected the level of self-perception about the form of place (Relph, 1976), context of analysis (APA, 2006), and environment issues (Reed, 2012; Kim & Kim, 2015) by researchers.

Studies showed students their enhanced contextual knowledge through the personal mapping process (Okebukola, 1992), even with a simple drawing (Taketa, 1996; Tafahomi, 2020), or a freehand-based mapping to better perception about the context of the study (Metz, 1990; Reed, 2012) through the development of design thinking (Goldschmidt, 1992). The process of mapping helps students to better perceive the context (Umek, 2003; Pearsalla, et al., 2014; Kim & Kim, 2015) although Cho criticized the non-graphical outputs of students without graphical productions in terms of creativity and innovation (Cho, 2017) at design studios.

In fact, mapping is one of the significant aspects of the learning process, particularly in architectural design studios since it can reflect attributes of data such as location, size, and form in the whole process of the studio, including analysing, conceptualising, and designing. In this regard, SWOT as a text-based framework can support drawings, maps, and graphics. Therefore, there is necessity to convert those non-graphical data into graphical maps to enhance the level of learning in studios. In other words, architectural studies illustrate different aspects of data such as shape, form, and quality in the mapping process through graphical drawing and design (Ching, 2010). The mapping process requires graphical creativity such as symbols for an explanation of urban features (Shive & Francis, 2008) as representative of data (Gasselt & Nass, 2011) and colours (Brewera, MacEachrena, Pickleb, & Herrmann, 1997; Parker, 2006). Symbols are combined with figure (Trancik, 1986), figurative elements (Goldschmidt, 1991), diagrammatic and compositional (Tschumi, 2014), abstraction and schematic representation (Laseau, 2000). Point, line, polygon, and colours are the common graphical features to represent spatial objects on a map (Dua, Fengb, & Guoc, 2015; Tafahomi, 2021), which have been emphasised as the main element of graphical drawing by Ching (Ching, 2010). Therefore, the structure of SWOT could be harmonised with the mapping process and production through appropriate graphical techniques such as symbols and tones of the colours (Brewera, MacEachrena, Pickleb, & Herrmann, 1997).

The main question of this paper is how the students apply graphical features to mapping the non-graphical data at the architectural design studio? To discover determining factors, the process mapping SWOT by the students was carefully observed and interpreted.

Relevant Studies on SWOT and Mapping

SWOT has been used in industrial and marketing activities (Sevkli, Oztekin, Uysal, & Torlak, 2012) as internal and external assessment (Jessica, Kruse, & Miller, 2015), and it has since developed as a synthesis of research for higher analysis, or meta-analysis (Vermeersch & Vandenbroucke, 2014). SWOT can also serve systematic assessing, analysing, and formulating conditions and strategic decision-making (Dyson, 2004) and currently, it has been widely applied to diffident fields (Sevkli, Oztekin, Uysal, & Torlak, 2012).

There are varieties of studies about SWOT from different perspectives. For instance, a study highlighted SWOT as a meta-analysis level to summarise and re-categorise other research techniques (Vermeersch & Vandenbroucke, 2014) although Pavelsky and colleagues argued that SWOT has limitations in the experimental analysis (Pavelsky, et al., 2014). Moreover, other studies recommended that SWOT can be integrated with other techniques such as AHP (Analytic Hierarchy Process) (Kurttila, Pesonen, Kangas, & Kajanus, 2000; Etongo, Kanninen, Epule, & Fobissie, 2018), ANP (Analytic Network Process) (Sevkli, Oztekin, Uysal, & Torlak, 2012), and experimental inquiries (Pavelsky, et al., 2014), perception and feelings (Curtis, 2012), ecosystem and environment (Scolozzi, Schirpke, Morri, & D'Amato, 2014), and geography (Kalafsky & Sonnichsen, 2015) as a complementary technique. Another group of studies criticized that SWOT includes deficiencies that application of SWOT requires to be developed through other methods (Ghazinoorya, Abdia, & Mehrb, 2011), which was recommended a hybrid method for increasing the usability of SWOT (Kurttila, Pesonen, Kangas, & Kajanus, 2000).

Despite analytical ability, studies challenged SWOT in the mapping process. For example, Tafahomi attempted to represent the perception perception of inhabitants about the urban heritage elements through the graphical features although the level of the precision was not accurate (Tafahomi, 2021). Lee and colleagues (2015) mentioned that the

application of SWOT in mapping production challenges the mind of the researcher to discover new approaches to modify the key items in the matrix with spatial structure, which Fadel and colleagues highlighted the limitation of SWOT for covering data in specific areas (Fadel, Rachid, El-Samra, & Boutro, 2013). Non-graphical data have challenged researchers in the mapping process in terms of graphical representation. For example, Pearsalla and colleagues (2014) discovered that students have had a personal perception about the environment, so in converting the verbal information into spatial and mapping, they create their own idea in the mapping process. Particularly, freehand drawing has proved an increase in the level of learning in the mapping process (Umek, 2003) through location, shape, size in terms of important factors for students (Harwood & Rawlings, 2001). Choosing symbols and colours on the map has had a significant role in making visible data (Shive & Francis, 2008) and showing attributes of maps based on the readability of maps with colours such as purple/green (Brewera, MacEachrena, Pickleb, & Herrmann, 1997). Mapping SWOT needs appropriate symbols as a code (Gasselt & Nass, 2011) to graphically illustrate data (Otto, Gustavsson, & Geil, 2011) in terms of spatial objects (Dua, Fengb, & Guoc, 2015). In this case, studies also showed, there is a mutual process between decoding and coding environmental aspects in the process of mapping (Kim & Kim, 2015), which Reed highlighted the effective influences of the mapping process on the quality of learning among students (Reed, 2012).

Results of another study theorized that a conceptual map as a meta-learning tool could promote problem-solving skill individually and collectively between students (Okebukola, 1992) and this process of cooperative mapping was also mentioned in another study in terms of the open-street-mapping (Panek, 2015). Freehand sketching and mapping have provided a profound understanding of context of the study, also represented the meaning of the effectiveness (Metz, 1990). In this case, the quality of sketch-mappings has been less important than the estimation and measurement process of location, distances, and scales by students (Taketa, 1996). Designers applied freehand sketching to both figurative and nonfigurative forms (Goldschmidt G. , 1991) and diagrammatic and compositional drawing (Tschumi, 2014). Goldschmidt highlighted that although a sketch could not explain all aspects of the image and assumption of the designer for problem solving, this sketching process leads the designer to discover gradually an image about the entire project (Goldschmidt, 1992). Additionally, studies have shown that the results of expert opinions in the mapping process could provide validity and necessity in the mapping productions (Chu, Gao, Qiu, Li, & Shao, 2010) through graphical illustration based on design thinking and problem-solving process.

Methods and Materials

The methods and materials consist of methodology, research design, research process, research limitation, and the application of the methods as below:

Methodology

The methodology of the mapping process is connected with a range of studies. The first groups of the studies emphasized the graphical features, techniques, and ability to apply data in the mapping process (White, 1983; Laseau, 2000; Lawson, 2005; Ching, 2010; Tafahomi, 2021). The studies also advocated the geographical techniques to apply to the mapping and visualization data in analytical maps (Dua, Fengb, & Guoc, 2015; Jiang, 2015). Some studies referred to the qualitative methods in the application of data in the mapping and visualization process (Groat & Wang, 2002; APA, 2006; Neuman, 2009). In addition, the application of the techniques in the classroom was discussed to emphasize the process of the acquisition of knowledge by the students (Goldschmidt, 1991; Goldschmidt, 1992; Otto, Gustavsson, & Geil, 2011; Tafahomi, 2020; Tafahomi, 2021). Some research presented the integration of the graphical and nongraphical data with the mapping process (Brewera, MacEachrena,

Pickleb, & Herrmann, 1997; Curtis, 2012; Ercoskun, 2012; Fadel, Rachid, El-Samra, & Boutro, 2013; Kalafsky & Sonnichsen, 2015).

Research Design

The study employed qualitative methods (Neuman, 2009) including experimental approaches (Groat & Wang, Architectural research methods, 2002), focus group specifically the students (Neuman, 2009; Silverman, 2004), and emphasising interpretation of data (Groat & Wang, 2002). The research applied the systematic observation of the students' analysis activities using graphical techniques (Dandekar, 1988; Groat & Wang, 2002; Tafahomi, 2009; Neuman, 2009; Tafahomi & Nadi, 2020) to interpret (Mugerauer, 1995; Krippendorff K. H., 2012) SWOT as a technique having potential to be applied to the mapping process. The significant criteria were location, boundary, shape, and scale (Jiang, 2015; Tafahomi, 2021), which were presented through graphical features, such as point, line, polygon, colour, and symbol (Dua, Fengb, & Guoc, 2015). More importantly, there was an interpretative process of visualization of data, personalization of graphical features, and presentation of thematic and integrative maps. Figure 1 represents the relations between criteria, methods, and research outputs.

Research Process: the research involved active observation of students' activities to develop SWOT in the design studio during one semester in three stages of the assessment including Macro, Meso, and Micro mapping. To apply the method to a real project, the students were introduced to graphical techniques, illustration, symbol, and mapping process by the graphical features and techniques to demonstrate their analytical ideas based on the application of graphic in architecture and design literature (Moughtin, Cuesta, Sarris, & Laurea, 1999; Groat & Wang, 2002; Oxman, 2004; Lawson, 2005; Ching, 2010; Tafahomi & Nadi, 2016; Tafahomi & Nadi, 2020; Tafahomi, 2021).

To engage the students as the focus group in the research, 25 students were divided into 4 groups around six members. They participated in mapping SWOT analysis. They analysed a specific area using thematic layers such as spatial, functional, perceptual, visual, and other essential layers (Moughtin, Cuesta, Sarris, & Laurea, 1999; Groat & Wang, 2002; Tafahomi, 2014). For this reason, the students visited the site to collect data through structured observation (Tafahomi & Nadi, 2016; Tafahomi & Nadi, 2020), survey (Neuman, 2009), and site analysis (Groat & Wang,

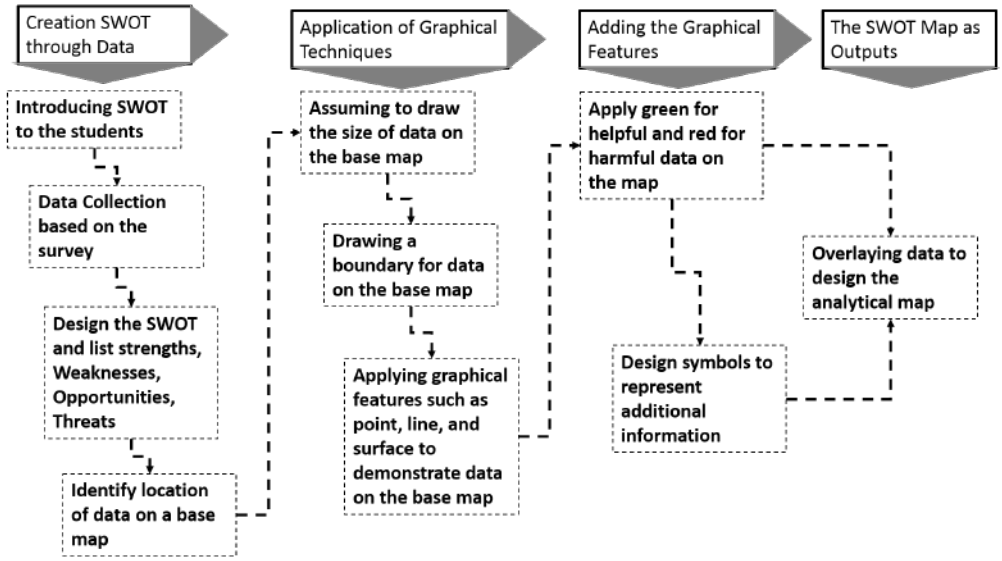


Figure 1: *Methodology of the Research*

2002). Secondly, all data were arranged (Reed, 2012; Kim & Kim, 2015) to develop SWOT matrix based on the students' perception and interpretation (Mugerauer, 1995; Krippendorff, 2012). Thirdly, the students identified the location of data on a map as placement of the data (Relph, 1976; Hedman & Jaszewski, 1984; Miller, Dingwall, & Morphy, 2004). Fourthly, the students transfigured data on a base map with some figurative elements importantly point, line, and polygon (Dua, Fengb, & Guoc, 2015; Tafahomi, 2021) regarding their own perception of location, size, and shape (Dandekar, 1988; Laseau, 2000; Tafahomi, 2009; Fadel, Rachid, El-Samra, & Boutro, 2013; Jiang, 2015). Fifthly, they designed iconic symbols to represent additional information on the base map (Otto, Gustavsson, & Geil, 2011; Kim & Kim, 2015). Sixthly, the students applied colours to distinguish the site-specific harmful and helpful elements on the map (Brewera, MacEachrena, Pickleb, & Herrmann, 1997; Shive & Francis, 2008; Gasselt & Nass, 2011), and finally the students overlaid data and thematic layers to produce SWOT map (Metz, 1990; Okebukola, 1992; Taketa, 1996). The aforementioned process was listed in the handout as the following items in Figure 2:

1. Create your own SWOT (Strengths, Opportunities, Weaknesses, and threats) based on the thematic layers of analysis
2. Map and specify the location, size, and boundary of data on the base map
3. Illustrate data on the map with visual features such as point, line, and polygon.
4. It is recommended to apply green colour for elements seen as helpful to the site and red colour for harmful ones with colors of spectrum showing intensity.
5. Overlay thematic layers and symbols to represent an analytical map.
6. Design and add symbols to express additional meaningful aspects on the map

Research Limitation: The research took the place in the fourth-year architectural design studio, where the students were introduced to urban scales such as Macro, Meso, and Micro based on freehand drawing, so, the possible effects of digitization on the process of the mapping were not evaluated. The students did analysis in seven weeks from the macro to micro-scale, and results could have been affected by extending time and duration of

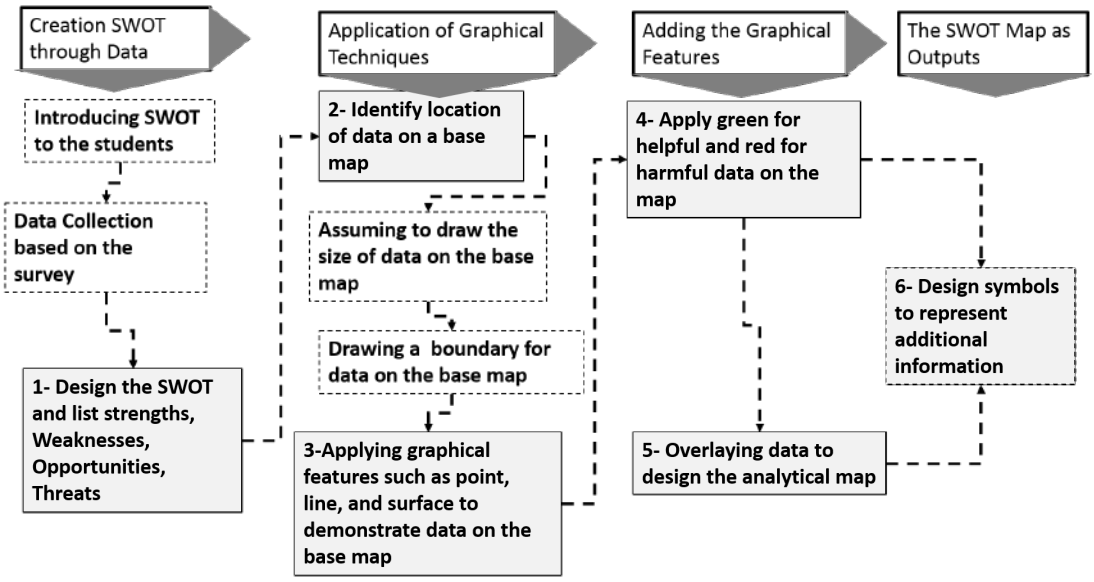


***Figure 2**: The Research Process in the Studio*

analysis on the application of graphical tools, techniques, and approaches.

Application of the methods: the students analysed wetlands at three levels including Macro, Meso, and Micro. For this activity, the students were arranged into four groups and each group collected data based on scales. At macro level, the students applied schematic mapping techniques to represent maps with a scale of 1/25000. They subsequently analyzed data with a scale of 1/10000 at meso level and from 1/5000 to 1/2000 at micro level. To collect accurate location-based data, they visited the site study and carried out survey. Consequently, the students received comments, critical points, and suggestions from instructors, other groups, and their own group members to revise, develop, and illustrate outputs in each stage of presentations.

The studio was held three times per week, and in each session; groups of the students presented the data, sketches, drawings, and maps for the desk critiques, suggestions, and discussion. Each group had time to revise the drawings and prepare the next presentation. The students explained the mapping process based on data, symbols, and logic in each presentation, the instructors and other groups criticized the presentation. Each scale of analysis such as macro, meso, and micro took two weeks of activities importantly five desk critiques and two presentations in the studio.

Analysis of the Results

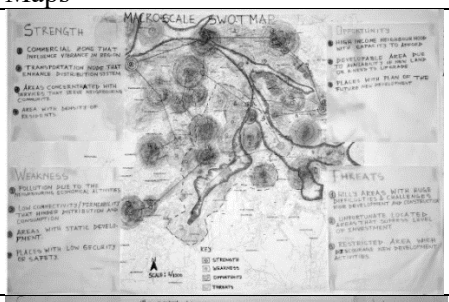
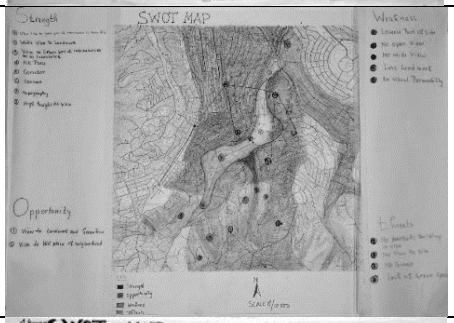
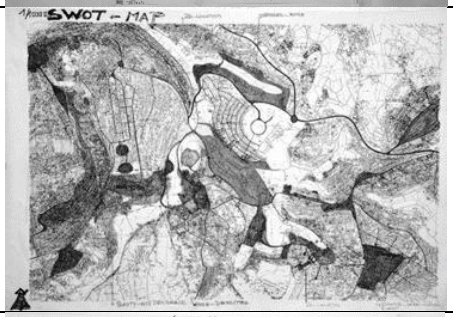
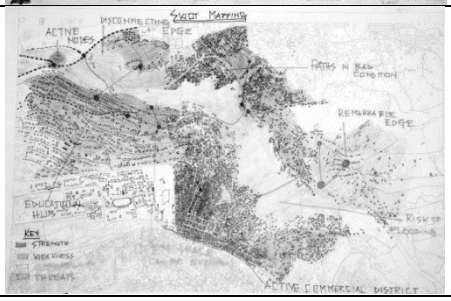
Tables 1, 2, and 3 demonstrate the graphical outputs of the students on three different scales, namely macro, meso, and micro, and table four and figure three compare the application of the graphical features on those scales.

Macro-scale specifications: the students applied polygon more than point and line on this scale. In other words, details of data were converted to the polygon (shapes) than other features. The application of tones of colours was more obvious than various colour on the scale, meaning a prodominent role of scale in comparison with diversity of data. In summary, three items applied frequently, namely polygon (planes), tones, and the overlaying technique as Table 1.

Meso-scale specification: the students applied graphical features in a modest way without any specific tendency. Indeed, the students mapped information and data in an average combination of the graphical features to discover visibility, and accuracy of graphical techniques. The maps reflected general information on marco scale and some parts with more detail referred to the micro scale. Table two represents the mapping presentation.

Micro-scale specifications: the students changed their approaches in the mapping data in micro-scale radically. The students highlighted some graphical features on this scale particularly lines, colours, and symbols in the mapping representations. The detailed data enabled the students to reflect the contrast, differentiation, and comparison of data in the mapping process, which was not possible in the other scales as Table 3 presents the productions.

***Table 1**: Application of Graphical Technique in the SWOTMAPPING Process, Macroscale*

No	Applied techniques by students	Maps
1	*Applying Visual Features:* Using points and lines as major forms of representation *Boundary:* using circles as boundary of the activities *Symbols:* no noticeable symbols in presentation *Illustration:* applying circles as the form of representation	
2	*Applying Visual Features:* Using points and polygons and some short lines to express analysis *Boundary:* using the roads as the boundary of those polygons. *Symbols:* no noticeable symbols in presentation *Illustration:* Using a wide range of surfaces based on the morphology	
3	*Applying Visual Features:* Using polygon as the context of analysis to express analysis *Boundary:* using the roads as the boundary of those polygons. *Symbols:* no noticeable symbols in presentation *Illustration:* Using different tons of red and green in the presentation of surfaces.	
4	*Applying Visual Features:* Using the large scale polygons to express analysis *Boundary:* using of the roads and topography as the boundary of those polygons *Symbols:* no symbols in presentation *Illustration:* Using different tons of red and green in the presentation of surfaces	

The scale was the important factor to apply different graphical features in the mapping process by the students. For example, the students applied points, buffer for the boundary, and overlaying technique more at macro-scale and meso-scale than micro-scale. However, line was more applicable to the micro-scale. The students applied both colour and tone with a limited variety on different scales. They were more adapted to define symbols on the detailed scales especially micro-scale than macro-scale in the mapping process. Therefore, these results identified the overlaying technique, buffer of boundary, and point features were more capable of the macro-scale although symbols and lines were more adopted to micro as Table 4.

Table 2: *Application of Graphical Technique in the SWOTMAPPING Process, Meso-scale*

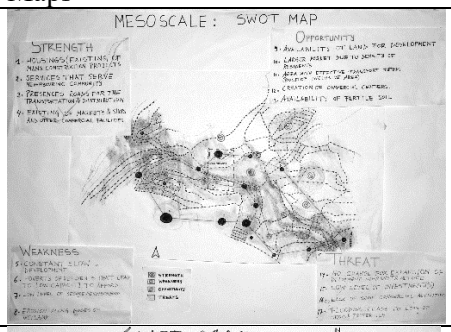
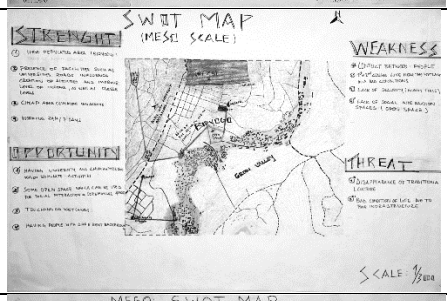
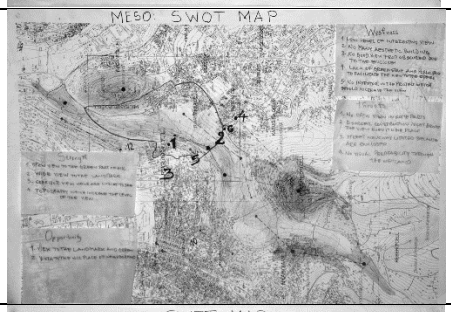
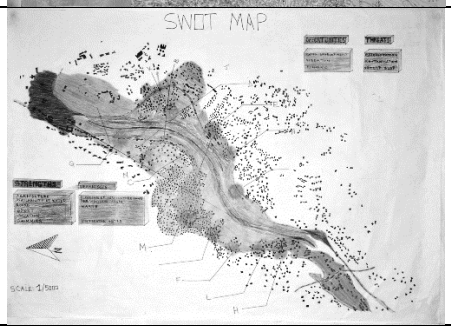
No	Specifications	Maps
1	*Applying Visual Features:* Using points and lines as major features in the representation *Boundary:* using the roads as the boundary *Symbols:* no symbols in presentation *Illustration:* figure and ground with the polygon and point used for the illustration	
2	*Applying Visual Features:* Using lines as major features in the representation *Boundary:* using the roads and wetlands as the boundary *Symbols:* no symbols in presentation *Illustration:* Applying polygons with different characteristics	
3	*Applying Visual Features:* polygons with the different tones *Boundary:* other polygons *Symbols:* no symbols in presentation *Illustration:* Applying polygons with different characteristics	
4	*Applying Visual Features:* Applying polygons and lines with different characteristics, Boundary: *Symbols:* Using the lines as major symbols in the representation *Illustration:* integration of tones of red and green to represent different meanings	

Table 3: *Application of Graphical Technique in the SWOTMAPPING Process, Micro-scale*

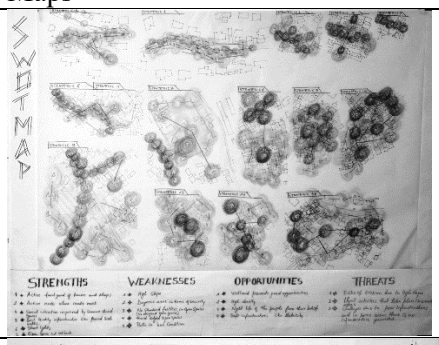
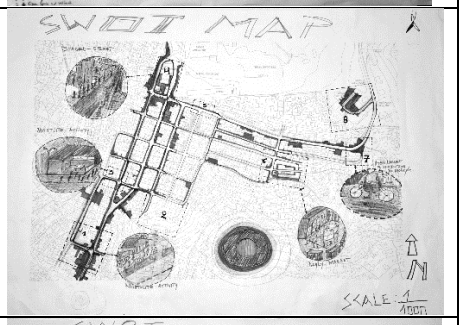
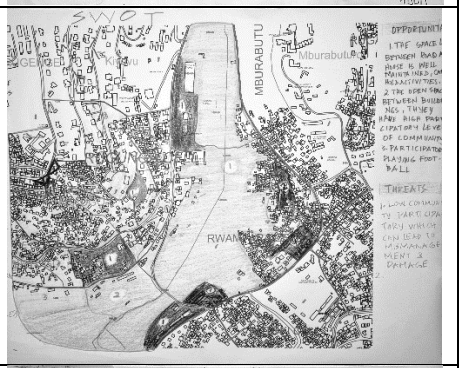
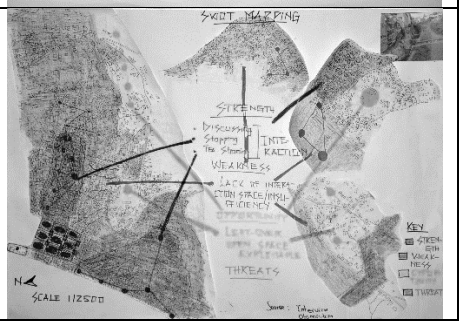
No	Specifications	Maps
1	*Applying Visual Features:* applying of the point in different compounds to achieve line and polygon illustration *Boundary:* unclear *Symbols:* applying tones of colours as the symbols *Illustration:* overlying points in varieties of size to form lines and polygons with diverse colours and tones Integration between texts and graphical symbols	
2	*Applying Visual Features:* applying lines as major features *Boundary:* unclear *Symbols:* sketches as symbols in presentation *Illustration:* some detailed sketches applied as the detailed symbols for the specific areas	
3	*Applying Visual Features:* using the lines and polygons as major graphical features in the presentation *Boundary:* applying the street as the line of boundary *Symbols:* using the combination of polygon and colour as symbols *Illustration:* integration of the polygon with overlaying	
4	*Applying Visual Features:* integration of all graphical features in the presentation *Boundary:* unclear *Symbols:* using the combination of line, polygon and colour as symbols *Illustration:* integration of the polygon with overlaying	

Table 4: *Comparison of Graphical Techniques in the Scale-Based Mapping Process*

No	Scale	Applied Elements in the Maps	Point	Line	Polygon	Colours	Tones	Symbols	Overlying	Texts links	Boundary
1	Macroscale	Group one	√	√	√	√	√		√	√	√
2		Group Two	√	√	√		√		√	√	√
3		Group Three	√	√	√	√	√		√		√
4		Group Four			√	√	√		√		
Ferequencies in Macroscale			3	3	4	3	4	0	4	2	3
1	Mesoscale	Group one	√	√			√		√	√	√
2		Group Two	√	√	√		√		√	√	√
3		Group Three			√	√	√	√	√		
4		Group Four	√	√	√	√	√	√			
Frequesncies in Mesoscale			3	3	3	2	4	2	3	2	2
1	Microscale	Group one	√	√	√	√	√	√	√	√	
2		Group Two		√		√		√			
3		Group Three		√	√	√	√	√		√	√
4		Group Four	√	√	√	√	√	√	√	√	
Frequesncies in Microscale			2	4	3	4	3	4	2	3	1

Figure three shows applying the graphical features and techniques for comparison with the three scales. Despite a variety of application of the graphical features in the scales, the figure illustrated a deep inconsistency in the application of the graphical techniques and graphical features due to scales.

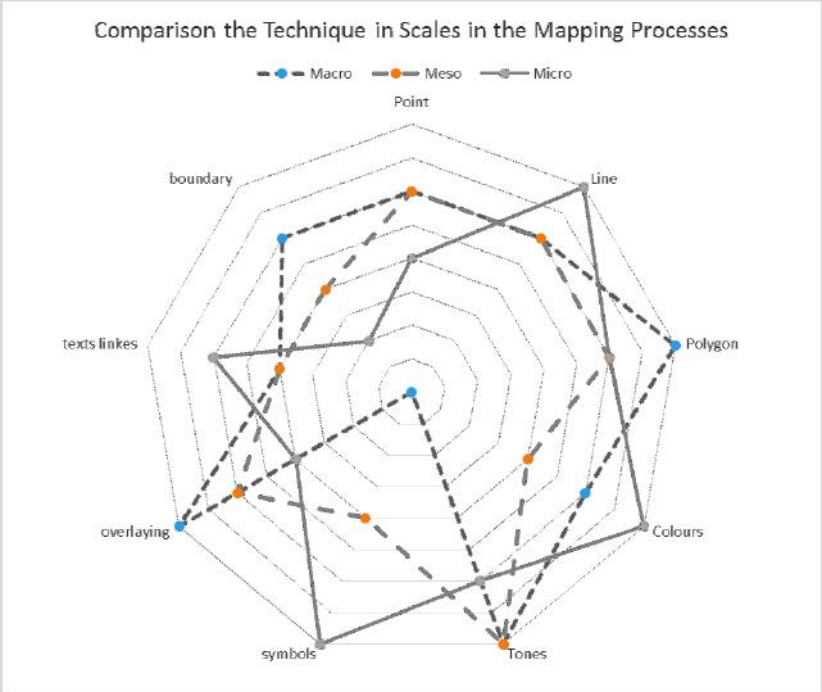


Figure 3: *Level of Application the Graphical Items in the Mapping Processes*

Discussion

Results of the study identified that the application of graphical techniques regenerated graphical outputs of SWOT to represent graphical maps in the architectural design studio. This output supported the ideas of Laseau (2000), Lawson (2005), and Ching (2010) as the application of graphical techniques in terms of a way of thinking through a graphical approach. The application of the graphical techniques in SWOT not only introduced the students to other approaches to represent graphical data but also helped the students to understand the value of the deep analysis of text-based data with effective results on the learning outcomes in the design studio. This result covered the arguments put forward by Fadel, Lee, Kim and colleagues about the absence of the use of location-based data and attributes at design studios (Fadel, Rachid, El-Samra, & Boutro, 2013; Lee, Yuan, Jung, & Beighley, 2015; Kim & Kim, 2015). The mapping process of SWOT regenerated the application of the graphical techniques based on the scales that supported the idea of Ghazinoorya (2011).

Mapping SWOT analysis confirmed both theories of graphical techniques and structure of Harwwod and Rawling (2001) and Laseau (2000) based on symbol, and overlying, and diagrammatic icons including location, size, and form, and graphical features grounded on the findings of Dua and Tafahomi (2015; 2021) such as point, line, and polygon. This process of mapping not only increased the level of perception, representation, and discussion among the students similar to the results of Pearsalla (2014) but also this process documented and demonstrated processes of skills development by the students to obtain a profound perception about analysis and design to proceed the idea of Oxman (2004) as the progress of thinking through mapping. Furthermore, this result covered the gap mentioned by Lee and colleagues (2015) as a limitation of SWOT in the mapping process and outputs.

Findings revealed that the students represented their own perception about context of the study, and they obtained a higher level of interpretation and illustration of data in scales progressively similar to the idea of Reed and Kim (2012; 2015) in terms of cognitive learning and learning through mapping. Also, this result concurred with the findings of Okebukola and Taketa (1992; 1996) as the positive effects of the mapping in the problem-solving process. Indeed, the students promoted the ability of their own team members with the design thinking in each stage of freehand mapping similar to the findings of Metz and Goldschmidt (1990; 1992) as the representation of the context in the mapping. The application of the graphical techniques enhanced the validity of data in the mapping process regarding expertise productions, which confirmed the idea of Chu (2010) concerning sufficient and efficient levels of perceptions about the context in the mapping process. The progress of the students in the mapping process was in the line with the findings of Umek (2003) and Pearsalla (2014) based on the progressive process by sketching-mapping.

The application of graphical features and techniques in the SWOT regenerated hybrid techniques such as sketching, drawing, and designing symbols. The students gained more opportunities to develop their ideas and understanding of the quality of the maps similar to the results of Laseau and Groat (2000; 2002) and Kurttila (2000) as graphical expressions. Illustration of data with the spatial specification in the mapping process such as location, size, and form improved those deficiencies introduced by Pavelsky (2014) and Lee (2015) in terms of experimental and location-based problems. The ability of localizing data and comprehending location-based relationships throughout the mapping process was aligned with survey methods and techniques like Moughtin and Groat studies (1999; 2002) in the site analysis technique.

Outputs of the analysis identified that the students illustrated symbols in several forms through graphical techniques in the mapping process. They applied symbols to attach information to the graphical features, such as point, line, and polygon, which were

highlighted by Dua (2015). The symbols were more iconic than symbolic and index signs. Despite the fact that the students used colors in a limited variety, colors were vividly connected with the type of data according to the findings of Brewera (1997).

Conclusion

Graphical techniques play a significant role in the analysis process in architectural design studios. Particularly, the application of graphical techniques, features, and symbols for non-graphical data could generate effective outputs in the design studio. Although the students of the architecture program are confident of tracing, sketching, and drawing for the analysis activities in design studios, adopting graphical techniques and features could develop their skills in production, presentation, and representation processes. These graphical techniques are suited to both location-based data through survey, observation, site analysis, and text-based data such as SWOT matrix. Therefore, mapping SWOT help students to enhance the level of understanding, consolidating, and visualizing data with different location, connection, size, and scale. Moreover, a graphic representation of SWOT analysis (SWOT map) as one of outputs of architectural design studio can facilitate both conceptualisation and design processes in the further stages of the design studio.

Application of the graphical techniques positively influences the students' products in the studios particularly on the process of the classification of data, presentation of analysis, and representation of the results. Therefore, the students not only personalise the process of the learning by personalising using graphical techniques but they also innovate their own styles as a subjective-learning process. This learning process develops through comments, critics, discussions in the group for innovation of the appropriate graphical techniques and features.

There is a clear process of personalisation of the graphical techniques in the mapping process in the architectural design studio. The students started from a rough, primitive, and simple style to apply the graphical techniques and they developed a more detailed and integrated style of mapping, from the macroscale to the microscale. The results of the research approve that both training the students to obtain new graphical skills and oriented critical sessions provide opportunities for the students to develop their abilities and skills. The application of the graphical techniques in the mapping process of the SWOT creates a paradigm-shifting from the non-specified texts to the location-based data as spatial analysis.

Nevertheless, the research also faced some deficiencies in the process of mapping that needs to be taken into account in future research. Firstly, presenting data requires more or integrated colours to facilitate representation particularly in the overlaying and overlapping. Specifically, the research took the place in an architecture design studio based on freehand drawing for mapping. This style faced a limitation to employ colour, tone, and contrast. Perhaps digitized design studios have more opportunities to apply a variety of colours in the mapping process. Secondly, although both colour and tone were sufficient for the presentation of the harmful and helpful data, the final maps require extra graphical features such as hatching, pattern, or coding to illustrate comprehensive graphical data. Finally, innovation of the symbols is a time-consuming activity in the mapping process in design studios, which introducing clusters of the symbols before the analytical phase facilitate the process of mapping. The symbols also require to be adjusted according to scale and relevant information. They can be derived from urban design, landscape, and geography-related mapping techniques to specify data based on themes, layers, and scales.

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The Instrumentalization of Fictional Narrative in Relation to Architecture-Urban Environment: The Example of "Laughable Places" Workshop

Merve Eflatun
Gebze Technical University, Faculty of Architecture, Department of Architecture, Kocaeli Turkey

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M. Eflatun ORCID: 0000-0002-5529-3918
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Abstract: Interdisciplinary approaches and distinctive representation methods are needed to expand the range of meaning in the architecture and to consider the design process in unique frameworks. Literature disrupts the static images produced for the city in the context of the imaginative weight and the various dynamics it makes with the reader also uses the city, space, and architecture to create a different dimension of representation. This situation, which is inspected in the article regarding the relationship between literature, city, and architecture, will be examined through the "Laughable Places" workshop, that is part of the e-workshop days held at Gebze Technical University in February 2021. In this sense, firstly the relationship between literature and architecture and the revealing of their potentials are handled through the imaginative, representational and textual dimensions. Than through various workshops where the relationship between fictional narrative and architecture is applied, it is reviewed in which contexts fictional narrative can be included in the intellectual process of design. This review has been grouped according to the method in the workshop setups, using the fictional narrative based on literary works or the writing fictional narratives by participants. The workshop process was interpreted through the hybridity of the two approaches.

Keywords: Literature, Architecture, Creativity, Workshop, Representation, Design

1.Introduction

Interdisciplinary approaches have an increasingly integral place in the understanding of architecture and the design process. Various approaches provide the opportunity to read the ontology and epistemology of architecture in new frameworks, as well as recognize new areas by creating peculiar contexts in the design process. Main aim of this article to evaluate the effect of fictional narrative, which generally constitutes the nature of literature, on the perception of architecture and the city, through various interdisciplinary workshops held in this context.

Literature, which transports the nature of fictional narrative, can be evaluated as a discipline that approaches architecture, architectural design, and the city in assertive contexts. However, it sticks in the mind that it is a field that differs from architecture. It can produce the potential to create new contributions by feeding off this separation and convergence. In this sense, it can be thought of the fictional universe as a cultural product that tries to reflect the environment in that the universe is predominantly located, on the contrary, it might be thought that architecture

has a closer relationship with situations that reveal concreteness.

It is possible to say that another situation that brings fictional narratives closer to architecture and enables us to think together is the dimension of the city/architecture that is prone to produce a narrative. Leach (2002) states that human-oriented solutions such as structure, park, and transportation networks that emerge by creating a relationship with the place in the city compose more meanings than they show and need rooted powers than those that appear on the surface (p.2). Graham Livesey (2004) points out that the lives created individually or collectively can be structured as a narrative. He says that since the human touch of architecture and the city is revealed through the acts of construction, settlement, and interpretation it will be possible to look at it from the perspective we look at the narrative (p.33). Barthes (1986), on the other hand, emphasizes that the narrative dimension of the city is unfolded by the coexistence of visible and invisible elements. He likens the narrative of the city to a poem that is consistently transforming and can be read in different ways, without any center or theme. De Certeau (2008) uses similar expressions and likens the city to a story.

Thus, it becomes possible to talk about the existence of a narrative dimension that associates fiction with architecture. While the narrative character of literature has a fictional structure that progresses through "fiction" and has the opportunity to be re-evaluated with the reader, the narrative character of the city is abstract and can be reproduced many times by those who experience the city or architecture, and it can be translated into a literary genre by metaphorizing the mere existence of the city.

The article problematizes the practices of fictional narrative on architectural workshops through the workshop titled “Laughable Places” held at Gebze Technical University on February 19-20-21, 2021. After the literature review, the article exemplifies the studies in different scales in which "fictional narrative" is used and read the workshop, which was made by discussing, positioning it according to these studies. It evaluates the relations produced by the fictional narrative with architecture, and the workshops made in the light of these, through the titles of literary fictions and original fictions. The workshop, on the other hand, discusses the hybridity of the two approaches. The methodology in the workshop keeps the fictional narrative both readable and re-evaluable through what is read. In this sense, various stories were read and brought together to form a new fiction based on essential elements such as subject, place, and temporality that make up the fiction. Additionally, it figures out the relationship between the fictional narrative and architecture as design, representation, and narrative.

2.Relationship Between Architecture and Fictional Narrative

The word narrative, which comes from the root to narrate, expresses the situation in which one or more. Also, real or unreal events are told with at least one narrator (Prince, 2003, p.58). The narrative is defined by Ricoeur (1984) as a discourse of the narrator describing the discourse of character, arguing that this stems from the human need to give meaning to things naturally. The program that we listen to, a meeting with friends, myths, and historical processes can be included in the narrative (Fludernik, 2009, pp. 1-2). At the same time, performative arts, cartoons that added text can be comprised in different forms of expression that have the potential to be visual and auditory (Chatman, 2008, p.25). Fictional narrative, on the other hand, is a narrative approach that has the characteristics of narrative. Nonetheless, it is debated whether is the relationship with the actual world is imitation or an imitation due to fiction of it (Ricoeur, 1979).

The state of being fictional, which is also a part of literature, in other words, the fictional narrative is an occupation that has spread over a long period. Again, in this sense, it is possible to say that fiction has a structure that is different from everyday language. We do not look for word games, style, or a second meaning in the ordinary narrative that

conveys any event. Similarly, even if fiction contains a narrative reality, there is fiction (Eagleton, 2015, p.130). Meanwhile, literature, which has fiction, uses it and another tool that defines it, using different ways such as the rhythm, sound, narrative technique of the language, and it distinguishes literature from everyday speech (Eagleton, 1996, p.2). Therefore, it seems necessary to describe the literature as a narrative, perhaps a new act of construction. It can be considered the creative focus like fiction, which is a narrative about everything, or the emergence of a literary work as a flexible phenomenon that can be considered in different environments. In the fictional narrative author has the opportunity to discuss language, fiction, narrative structure, one-to-one communication with the reader, and discussion both within and outside the field through its reproducible construction.

Herewith, it may be evaluated fictional narrative as a tool that can fuel originality or creativity in architectural design because it allows seeing known physical spaces differently. Because quest of literature for concreteness does not have to explain the world we live in as it is, thanks to its progress only through literary representation. Contrarily, the act of writing has the potential to hide and reveal meanings at will, as well as informs many contradictory situations (Grafe et al., 2006). Charley (2012) draws attention to the possibility of using literature, which includes fictional narratives, in research on design history. He mentions that looking at what historical movements that can be read with the changes in the form and structure of the language have changed in the course of both literature and architecture will allow different readings. Furthermore, he states that literature can enrich our understanding of the place and promises more than what an architectural guide to the city can deliver (Charley, 2012, p.1-3; Kimber, 2010, p.70).

"The Poetics of Space" that one of the note-worthy books of Gaston Bachelard, has a cult place in architectural literature, can be given as an example of the fertile field created by the fictional narrative. Bachelard (1996) states in the book that space can not be read-only with its physical values, but peculiar definitions can be produced as it is experienced. In this context, he uses novelists and poets such as Bocho, Rilke, Baudelaire to reveal the different meanings of home. Also, the relationship between language use of literature and fiction and the city has a meaningful place in the way of thinking of architecture. For instance, Graham Livesey (1994) expresses that the relationship between architecture and fiction constitutes the preoccupation of architects such as Peter Eisenman, Bernard Tschumi, and Nigel Coates, and the affiliation between fiction and architecture investigated in various ways. These can be realized by incorporating the narrative or narrative structure of the architect into the process, by creating a backdrop that allows new narratives of an architectural act in the city (it can be an architectural work or a piece of the city), or by transforming it into concrete architectural products through architecture, memory or allusion.

Diversely, a fictional narrative is contemplated as a forceful resource in the design process, rather than just a better understanding of the city/architecture or characterizing it as an original guide. Gomez (2012) states that when literary language is approached phenomenologically, it has a poetic, origin and multiple meanings. Therefore it can help to find cultural resources in the atmospheric expression of architecture. We can think of literature as a rich source of insight, and this is the case that puts it beyond a scientific map or percentile calculations. The fact that the novel is a simple narrative form used all over the world will help the architect to understand other cultures and lives also developing a sense of empathy in design (pp. 179-188). Havik (2018), on the other hand, imports that the literary language will help us better understand the complexity of architectural experience as well as familiar architectural tools such as maps and plan sections in the sense of atmosphere (p. 271). To deduce that experiencing the novel has an influence on the design process of the architect in terms of

understanding the human being is described as a generalized value of literature. The crucial part is that this whole set of values produced by literature, both the slippery state of the literary space with the non-concrete potential and the position of the reader open to the imagination in their experience.

Even though the fictional narrative is marked in an exact place, it is continued by the reader on a spatial basis. For the spatial possibilities of fiction, frames defined by Ruth Ronen (1986) play an operative role in the conception of architecture in reflection. According to Ronen (1986), space intervenes in certain frames in fiction. It should be evaluated by a material dimension that will be followed indirectly apart from the text. Spatial productions are carried out in various variations in a situation that is integrated with the character and the event. Likewise, Mikhail Bakhtin (1981), who was one of the first to think properly in a way, will also be the subject of chronotope. All that is shown in the time, place, and calendar from time of "crono" may come together as necessary and whole. In the chronotope, which considers time as a concept that can thicken, time can be seen as it accumulates. The place is also treated as a story, historical and progressive force (Bakhtin, p. 84). In this sense, the space of fiction, the spatial design of architecture can be dull and otherwise transformed. But here, fiction of reader and author is a complex link, like a region that expands the fictional space in the frame.

"The death of the author" that the thought of Roland Barthes also points out to this situation. Barthes (2018) says that when it is looked at the text-only from the perspective of the author opens up to a single meaning, and as the number of readers reading and interpreting the text increases, the text will have the chance to be rewritten many times. Do not assume a position that aims to explain everything about the universe in which the fictional narrative is formed; the fact that a narrative in which everything is told has the potential to extend indefinitely allows the reader to move forward by filling in the gaps. The fact that the narrative expects from the reader (Eco, 1995, p. 9). Hereby, the thought of the fictional narrative can act as a mediator in the understanding of architecture and the city in the design process is possible to say. At the same time, a fictional narrative is observed as a potential value that can provide interdisciplinarity in the design process and feed the design process.

3. Fictional Narrative as a Tool of Architectural Design Process

The rapid increase in the scope of knowledge in the twentieth century reveals that cultures with a disciplinary approach and perspectives that draw borders are not inclusive of different forms of inquiry and explanations. With this increase in knowledge reminding the importance of interdisciplinary approaches, it is mentioned that many of the academics who implement the approach are more courageous in their ideas and are more inclined to transcend traditional knowledge patterns (Lattuca, 2001, pp.2-3). As a nostalgia aimed at the integrity of interdisciplinary circles in knowledge, it engages in extensive, comprehensive, disciplined exemplary practices integrated with this society; creating knowledge on small scales (Klein, 1990, pp. 11-12). Interdisciplinary approaches are becoming a frequently used phenomenon both in design history and in design itself (Walker, 2009, p. 47). Besides the narrative is a focus of discussion about what is architectural. The interrogation of different disciplines and nations after the architecture of the 1960s is observed extensively through narratives of space and literary narratives (Nesbitt, 1996, p. 17). Likewise, Kristeva (1980) states that the transformation in the 60s had a profound impact on theoretical approaches. With pieces of training in these narrative design studios against language, teachings, the question of "fiction" is questioned.

Herewith, it is revealed that the narrative is being used in various ways in the design process of architectural education. The narrative is used informally in the education process, but the resource of the narrative itself is not sufficiently used. Hence, it is suggested

that the narrative can be structured in various contexts and used in the process: The ways of this can be done by narrating the lives of famous architects, constructing an architectural story, exercising the sense of space or place in the story and concretizing these spaces (Nazidizaji et al., 2015). Thinking in the context of narrative as a concept of design; it is mentioned that it can offer a different perspective to the designer in conventional design processes (Gerards & De Bleeckere, 2014). Erickson (1996), on the other hand, says that working as a storyteller is an exceptional tool for understanding the point of view of the user. One of the problem- solving activities approached with various linear methods of approach to design through narrative; It carries a non-linear puzzle solution that thinks about complexity into activity (Çelik & Aydınlı, 2008).

It is possible to observe the attempts of the integration of the narrative of fiction into workshop processes in different ways. Within the scope of the article, it reminds the possibility of the workshop experiences, in which the fictional narrative is included, the opportunity of the narrative infiltrating everywhere, becoming fiction, and turning it into an architectural representation. It is noticed that the fictional narrative is mainly considered in two different ways in these workshop processes. One of them is the fact that the ready-made fictional narrative enriches the design process. This approach is realized both through an urban or spatial pattern that is absolute or as a part of any design process that is fictional. Another method is to expect the participants to create a fictional narrative in the content of the workshop process. It may be said that in this approach, where the direction predominates of designer, concrete spaces are predominantly used.

3.1 Using Literary Works in a Design Process

It is remarked that the formats of the fictional narrative, which have become literary works written by the author, are transformed into a tool that will form a source in various workshop processes or the concreteness of architecture. For example, the application style of "The Laboratory of Literary Architecture" mostly works on producing space fiction by metaphorizing the narrative pattern in fiction.

They consider the narrative dimension of architecture and the architectural dimension of the narrative in the laboratory environment. To illustrate, workshop participants Joss Lake and Stephanie Jones produced a space setup based on both the narrative and the logic of the novel, in the space that was created based on novel "The Rings of Saturn" by W.G. Sebald (2006) (Fig.1). They think that the long and narrow nature of the space reflects the sincerity

Figure 1: *Model produced by Joss Lake and Stephanie Jones based on the novel "The Rings of Saturn" (Source: The Laboratory of Literaty Achitecture)*

of reading, and they associate the gradual rise of the road with the surprising nature of the novel. It is thought that light bulbs as details that the character in “The Rings of Saturn” uses to save the past. This suggests that a novel is a metaphorical approach that fuels creativity rather than a direct copyist approach while creating space fiction (The Laboratory of Literaty Achitecture, n.d.).

In the workshop organized by Argus and Writingplace (n.d.), literary methods were used to reveal the narrative features of the designs. Examples of work carried out in the workshop are a poem about a raindrop falling on a building or a monologue on a forgotten statue in Bogota. The study that was made in the basic design course at Yıldız Technical University is on the reflection of the images formed in the mind through literature. For this purpose, the black and white section was chosen from Istanbul Memories and the City by Orhan Pamuk (2006). After the text reading, an image was focused and texture was produced. The aim of the study is how the same text can evoke different images in the mind (Bekdaş, 2018). The studio carried out in Bahçeşehir University Interior Architecture Class 1 is about to use the poems of Edgar Allan Poe. It aims to make inferences about space and atmosphere through poems of Poe. As a result, it is possible to say that the discovery of the atmosphere is realized through literature (Gülmez et al., 2020).

Ultav and Hasırcı, differently, were expected to create atmospheres for the homes of various poets such as Gülten Akın, Edip Cansever, and Atilla İlhan in their studio work. For this, it is expected to produce a space atmosphere by making use of both the narratives of the lives of poets and their poems. An interpretation is generated by using concrete and abstract metaphors inspired by both poetry and life story. As an example of this, he uses the semiotic potential of the mirror reflecting life and emulating the life of the mirror, which is the representation of poem of Cemal Süreya "Kan Var Bütün Kelimelerin Altında" (There is blood beneath whole words) (Hasırcı & Ultav, 2012).

Reflecting from the fictional to the space design through various perspectives, and the search for the creative effect, as well as transformability of it into concrete architectural products in the literary work, generates a discussion. It can be said that there is an emphasis on considering fictional narratives as a new tool that enriches and triggers the world of thought and provides a different perspective on the design process.

3.2 Writing Fictional Narratives by Participants

Fictional narrative can provide a dynamic that allows participants to rewrite the city/architecture by making use of the fact that the city has narrative. The workshop titled “Narrative Architecture” has a structure that stands out from the fictional narrative. It is about the interpretation and narrativization of place. Yet the place is completely narrated and transferred on the mapping of the story. Afterward, the design process is narrated and the story of the place overlaps with the collage method. Therefore, "Narrative Architecture" has an exceptional fictional ground (Narrative Architecture, 2019). In the workshop titled "Street in Narrative-Kuwait City" participants experienced some buildings in Mubarak Al Kabeet Street and produced stories based on these experiences. It is noticeable to experience the city and the street with a new eye through the character, space, and scenario. Instead of focusing on a representation as it is, the participants were expected to produce experience diagrams and collages. Involvement of the generated characters in the space. Again in the workshop "In Narrative-Manama", a similar workshop setup was made for "Manama" this time. “Writing Architecture Through Fiction” (n.d.), organized at MIT, brings together the imaginative dimension of architecture with fiction. Transforming fictional writing into clear-sighted architectural dreams is the main path in the workshop. The historical and theoretical issues involved in the design process are conveyed through narrative architecture. Participants can narrate both the process and the design produced at the same time. In the workshop experience conducted by

Funda Uz (2007), the names of various places in Taşkışla are kept secret and they are expected to describe them through literary methods or models. As a result, the comparison of the reality of the place with the narrative or the similarities in the textual transmission were examined. Contrary to the examples in which literary works are used, it can be said that there is a reverse translation towards the fictional narrative in these workshops.

4. Laughable Places as a Hybrid Narrative Workshop Experience

"Laughable Places" is a workshop held on 19, 20, 21 February 2021 as part of Gebze Technical University e-workshop days conducted by Merve Eflatun. The reason that the name of the workshop is named "Laughable Places" is because it is predicted that the new stories and story spaces that will be formed due to the decomposition and then reassembly of different fictional narratives will contain. It is aimed to add the diversity of relationships produced by the reader to the relationship between text, architecture, and language. The fact that the reader also reproduces the story is an important point here. What is waited from the reader is to fill and represent the gap between the different fictional worlds in an integrated manner with his own architectural and narrative description. While doing this, it is expected to create additional events and produce the narrative. The reader who writes the story transfers his story to another reader to represent it. Thus, the practice of both writing a spatial narrative and analyzing another spatial narrative may be accepted as the main tasks (Figure 2). In the workshop process, literature is both a tool to enrich spatial perception and a kind of decoupage object of the design process as individual narratives are created by breaking up literary stories. The literary narratives in question were grouped into various stories depending on the space, subject, and time factor, and the participants were allowed to choose freely, provided that they chose from each group.

This grouping plans to comprehend the importance of factors such as space, time, and subject in the narrative, both in fiction and in architecture, and to ensure that different focuses on a narrative are perceived. In the title of the place, there are

Figure 2: *"Laughable Places" workshop (Photo by Başak Akdaş).*

differentiating urban-architecture relations such as a house that can go to various places, a future imagination for the Bosphorus, a Historical Peninsula that was closed as a result of an epidemic in an unknown future date. Narratives of Alan Lightman in the title of time contain different universe imaginations such as people have no memories, time pauses, and human life spans a single day. In the stories in the subject title, the characters such as the poet and depressive brother, whose books have not been published, can be seen as the main theme of the fiction. At the same time, there are stories of cult authors such as Ernest Hemingway and Gogol, which include characters with different personality additionally with some extraordinary life stories such as Simon Sigmar and Aurelio Quattrochi (Table I).

Table 1. *Stories that used in workshop process*

Space/Place	Time	Subject
Author: Dino Buzzati-Book: *"Tanrıyı Gören Köpek"* (The Dog Who Saw God) */ Chosen Story: "Büyük Otel Koridoru",* (Grand Hotel Corridor)	Author: Alan Lightman-Book: *"Einstein'in Düşleri"* (Einstein's Dreams) / Chosen part: *"İnsan Ömrünün Tek Gün Sürdüğü Dünya",* (In this world in which a human life) spans but a single day)	Author: C. D. Rose- *Book: "Olamayanlar"* (The Biographical Dictionary of Literary Failure) / Chosen Story: "Aurelio Quattrochi"
Authors: Eduardo Galeano& Isidro Ferrer- Book: *"Helena'nın Rüyaları",* (Dreams of Helena) / Chosen story: *"Kayıp Rüyalar",* (Lost Dreams)	Author: Alan Lightman-*"Einstein'in Düşleri"* (Einstein's Dreams) / Chosen Part: *"Bu Dünyada İnsanların Bellekleri Yok",* (A World Without Memory)	Author: C.D.Rose *Book: "Olamayanlar"* (The Biographical Dictionary of Literary Failure) / Chosen Story: "Simon Sigmar"
Author: Eduardo Galeano & Isidro Ferrer- Book: *"Helena'nın Rüyaları",* (Dreams of Helena) / Chosen story: *"Yolculuk Eden Ev",* (Traveling Home)	Author: Alan Lightman *"Einstein'in Düşleri"* (Einstein's Dreams) / Chosen part: *"Zamanın Durakladığı Bir Dünya"* (The World Stops)	Author: Ernest Hemingway Chosen Story: *"Kilimanjaro'nun Karları"* (The Snows of Kilimanjaro)
Editor: Kutlukhan Kutlu, Author: Engin Türkgeldi-Book: "Istanbul 2099"/ Chosen story: *"-"Sur",* (Wall)		Author: Nikolai Gogol-Chosen Story: *"Burun"* (Nose)
Author: Faruk Ulay-*"Beldeler Kitabı"*(The Book of Towns) / *"Kullanılmayan Nesneler Beldesi",* (Town of Unused Objects)		Author: Mevsim Yenice-Book: *"Bilinmeyen Sular"* (Unknown Waters)
Author: Faruk Ulay-Book: *"Beldeler Kitabı"* (The Book of Towns) / Chosen Story: *"Yıkılmış Uygarlıklardan Arta Kalan Nesneler Beldesi",* (Land of Remains of Ruined Civilization)		Author: Samantha Schweblin- Book: *"Ağızdaki Kuşlar" (Mouthful of Birds* / Chosen Story: *"Kardeşim Walter"* (My Brother Walter)
Author: HP Lovecraft- Chosen Book: *"Deliliğin Dağlarında"* (In the Mountain of Madness)		
Author: Orhan Pamuk- Book: *"Kara Kitap"* (Black Book) / Chosen Part *"Boğazın Suları Çekildiği Zaman"* (When the Bosphorus Dries Up)		
Author: Sait Faik Abasıyanık- Book: *"Alemdağ'da Var Bir Yılan"* (A Snake in Alemdağ)/ Chosen Story: "Dolapdere"		
Author: Gonçalo M. Tavares- Book: *"Beyefendiler"* (The Neighborhood) /Chosen Part: *"Balon",* (Baloon)		

The participants were divided into seven groups, fragmented various stories, brought them together with their own person-time/space-plot, and created new stories. It is possible to say that the stories constitute an example of collage in this sense. The purpose of the formation of the stories in this way is to reveal new potentials by playing with the time-space axis in the stories. For instance, "house", which is the subject of the story "The Traveling House", becomes a vehicle that the main character in "My Brother Walter" takes everywhere; the ninth-degree officer in "The Nose" story of Gogol takes part in an epidemic in Istanbul where everyone lost their nose; Harry, the main character of The Mountains of Kilimanjaro, travels to the Istanbul of the Black Book by reading his memoir.

When the stories were transferred to different groups, the groups were confronted with narratives that it can be considered partially foreign to them. At this stage, the groups represented the narratives on the axis of space-person-time (Figure 3). Here, the participants divided the newly written narrative into various sequences and used different representation scales such as collage, drawing, and model (Figure 4).

Although it may be considered the fictional narratives created by the participants as original structures due to their productions, there have been cases where they used similar pieces from various fictions. This situation has an noticiable place in the workshop process in the perception of different perspectives and the production of empathy in the triangle of representation, city-human relationship, and narrative. For example, exact passages were used by different groups in the "When The Bosphorus Dries Up" part in Black Book by Orhan Pamuk, but due to the differences in the theme of the narrative, the similar space definition found very different atmospheric expressions. Sometimes it was caricatured, and sometimes it was able to integrate more with the subject in the fiction (Figure 5).

Figure 3: *The process of stories that splitted up and invention of new stories (Story made by Beyzanur Kaymas and Rumeysa Kolcu).*

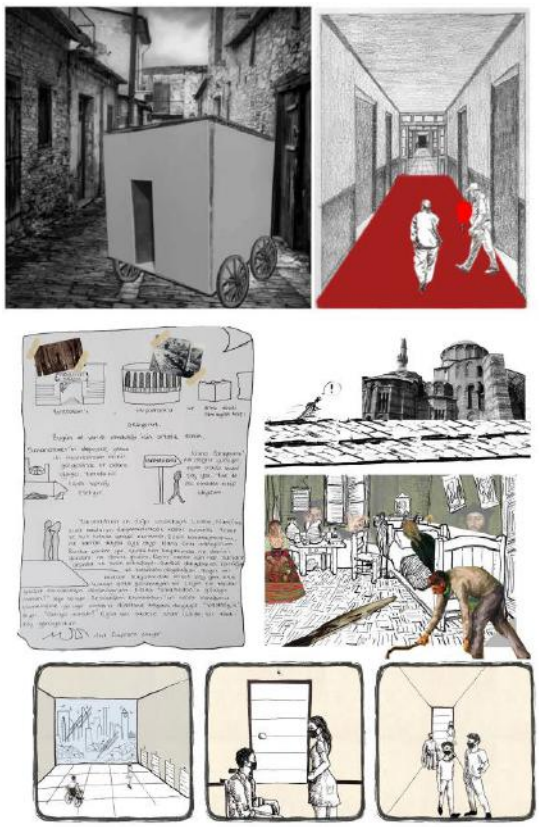

Figure 4: *Different representation techniques for discovering the relationship between space/time, subject (Images made by Başak Akdaş, Melisa Akkaya, Beyzanur Yiğit, İkbal Şimşek, Rumeysa Kolcu, Busenur Kalabalık, Güzin Eren, Nurseli Karatepe, Rana Özkan).*

The workshop participants have the opportunity to experience the relationship between fiction and architecture, with their productions, on two separate faces. The first of these is to use the literary one as a design tool and to complete it and turn it into a new design product, in other words, to evaluate a language-shaped phenomenon with the practices of architecture, and the second is to investigate the spatial equivalents of a fictional text with the eyes of the variable reader, and to help the reader both in the narrativity of the city/architecture and also realizes the potential of producing new writings over and over again in the representational dimension of the literary. It reminds us that the literary product itself is a design and the importance of language and expression. The workshop process can be

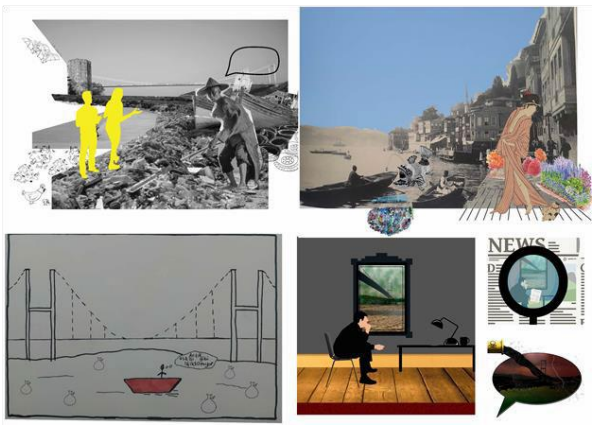

Figure 5: *The flexible representation of Bosphorus depending on the narrative atmosphere and participants (Images made by Cansu Sözer, İlayda Polat, Busenur Kalabalık, Güzin Eren, Beyzanur Yiğit, İkbal Şimşek, Başak Akdaş, Melisa Akkaya).*

described as a hybrid fiction in the sense that it both benefits from literary works and leaves a gap in producing fiction of one in the context of the relations it outcomes with it.

5. Discussion and Conclusion

It can be regarded as a fictional narrative as an expressive tool in the examination of the relationship between architecture and the city. It is understood that the workshops, which are written by the participant occasionally and sometimes open to discussion about the use of fictional narrative. The guide in creating an architectural practice through literary works can be both a mind-opening exercise in developing spatial practice and a convenient resource in non-architectural practices in terms of understanding the spatial nature of fiction. When the relationship between fictional narrative and architecture is evaluated with different combinations such as the structure of the text, plot, subject, time, rather than reading that will be carried out only by filtering the space, it becomes possible to read it as a "design process" that is opened to re-evaluation with the reader. It is noticed that the "Laughable Places" workshop not only strengthens the reader-writer relationship by processing the fictional narrative itself but also that the representation through fiction can lead to the discovery of new contexts. From

the perspective of the participants, the gap between the literary representation and the visual representation and the differing viewpoints according to the reader formed an important focus. They observed that reconstructing the texts and rendering them functional, rather than the one-to-one transfer of the architectural descriptions in the texts, provides different and new observation possibilities for the relationship between the text and the architecture. Participants stated that writing a text that contains both fictional and architectural content at the beginning differs from the conventional architectural representation. It was thought that it may be a critical approach to think about the relationship between architecture and the city in the narrative dimension. The use of literary and visual representation together can be contemplated both as a threshold to increase creativity in the design process and as a tool that can break the overhead view and expanded empathy in design.

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Zobo Tea Package Design Prototype Allied with Product Onomastics

Ayorinde S. Oluyemi
Department of Fine and Applied Arts, Nnamdi Azikiwe University Awka, Nigeria
E. Bankole Oladumiye
Department of Industrial Design, Federal University of Technology Akure, Nigeria
Oluwafemi S. Adelabu
Department of Industrial Design, Federal University of Technology Akure, Nigeria

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A.S. Oluyemi ORCID: 0000-0002-2743-2992, E. B. Oladumiye ORCID: 0000-0002-0001-546X, O.S. Adelabu ORCID: 0000-0002-1080-4083
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Abstract: The purpose of this design is to create a Zobo tea package design prototype allied with African indigenous onomastics. African indigenous products are effective in terms of functionality; however, industrialized products gained more attention because of aesthetics, safety, hygiene, and other advanced technology put into consideration during production. This seems to boost the inferiority of indigenous products. Hence, the present study focuses on indigenous Zobo tea in terms of creating a conceptual package design prototype enhanced with product onomastics. Twenty-two names are derived for indigenous Zobo tea by making use of linguistics techniques. These names are used as label for designing a conceptual package prototype for indigenous Zobo tea. A Delphi technique is adopted for the evaluation of this creative process. The findings show that homonym as an onomastics will enhance the branding and development of indigenous *Zobo* tea even in the international market. This will remodel the inferiority of the aesthetics of Zobo indigenous products. Hence, research on the choice of an appropriate name for a particular product should be a contemporary research area to improve the present situation of our indigenous product branding and graphic design. It is believed that the outcome of this research could provide guidelines for effective naming in product package design for indigenous product development; as creative designers must not only understand the vocabulary of graphic design but be aware of extraneous constraints that could affect their designs.

Keywords: Branding, Package Design, Product *Onomastics*, Prototyping Zobo Tea

1.Introduction

Conceptual prototyping is the creation of simple, incomplete models or mockup of a design for the purpose of exploring preliminary design ideas quickly and inexpensively (Collins Dictionary, 2012). This study explores product *onomastics* to elucidate one of the uncommon areas that graphic designers could be creative thinkers and expert communicators (Abushawali, Lim & Bedu, 2013). According to Abushawali, Lim, and Bedu, designers referred to themselves with more comprehensive designations such as 'Visual Communicator, Visual Designer, Graphic Communicator, and Communication Specialist in the international business world (Abushawali et al, 2013). Kirk thus opined, "If, given the opportunity to make a suggestion, all designers should know the general guidelines to product naming" (Kirk, 2013). Hence, present study suggests conceptual package design prototype allied with *Zobo* tea

indigenous *onomastics*. *Onomastics* entails the study of names and naming systems. It is derived from the Greek word '*onoma*' meaning 'name'. The idea of product *onomastics* is to create code of latent meanings for the product that the consumers can grasp either consciously or unconsciously (Marcel, 2013). Hence, this study is proposed as an attempt to build on the existing body of knowledge concerning *onomastics* (naming system) of *Zobo* tea and particularly focusing on the conceptual prototype by making use of Computer-Aided Design (CAD) software. Computer Aided Design can be seen as means of simulating a real environment of a design. It is believed that the outcome of this research could provide guidelines for effective naming in product package design for indigenous product development; as creative designers must not only understand the vocabulary of Graphic Design but be aware of extraneous constraints that could cause cognitive dissonance in their design.

2. Derivation of Product Onomastics as Regards Zobo Tea Package Design Conceptual Prototype

Sometimes, computer applications are used for name derivation; however, Lertcheva, Malik, and other prior researches explain the different derivational processes for forming brand names (Lertcheva, & Aroonmanakun, 2011 and Malik, 2015). Among these processes are alliteration (example is Coca-Cola), assonance (example is EvocaCola), consonance (example is Happy Hour), rhythm (example is Better Business Bureau), clipping (example is FedEx), blending (example is malt + tonic = maltonic), onomatopoeias (example is Pop), removal techniques (example is Natural – l = Natura), replacement technique (Example is Origin = Orijin), homophone technique (example is Active =Activa), suffice technique (example is power + ade= Powerade), prefix technique (example is Nutri + milk = Nutri milk). It is also discovered that the trado-medical practitioners in Nigeria make use of several morphological processes in naming their products and the commonest morphological process used is blending (Ogunsote, Prucnal-Ogunsote & Umaru, 2006). Accordingly, this research focuses on the onomastics (naming system) of Zobo tea and particularly focusing on the conceptual prototype by making use of Computer-Aided Design (CAD) software.

Considering Najmuldeen (2021) point of view about traditional graphic designers, present study adopts CAD software for conceptual prototyping instead of sketching on paper or by creating 3D model with cardboards. Despite digital divide affecting graphic design as identified by Najmuldeen (2021) present study adopts both 3D and 2D software namely Autodesk 123D Design and CorelDraw. According to Najmuldeen (2021) many traditional graphic designers are finding it difficult to adapt to the drastic change of using CAD. He predicted that young generation may face similar challenges in future because of the changing technology. Hence, present study adopt Autodesk 123D Design because it is an open source software and it is elementary in techniques. The interface is not complex and very easy to interact with. It is available in both 32bit and 64 bit, as well as online and offline platform. Present study is of the notion that one CAD software may not be able to perform all design tasks, hence two or more can be used (for instance, this study uses Autodesk 123D Design, Adobe Photoshop and CorelDraw. Recently, there is news that Autodesk no longer support 123D Design. Alternative CAD software includes AutoCAD, Sketch up, Solid Edge, SOLIDWORKS, and to mention a few. There is need to have research paper that documents CAD software such as Autodesk 123D Design. Hence, this paper fills this gap by using it for a conceptual prototyping because of its user-friendliness and commonness. A beginner can easily get the technicality needed for creating carton for a product by using Autodesk 123D Design. Notably, the form of a cube is readily available in a 3D CAD software.

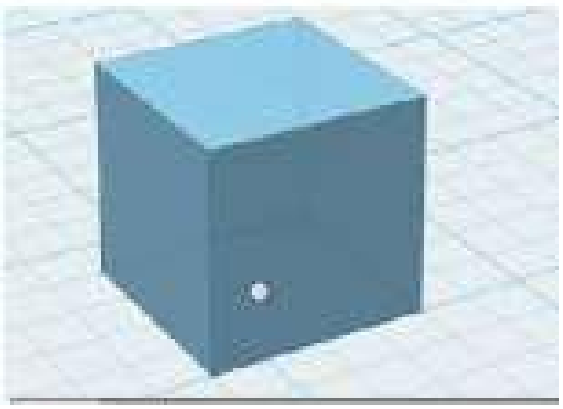

Figure 1: *A cube readily available in Autodesk 123D Design software.*

As glimpsed in Figure 1, the creation of a carton can be easy for someone new to 3D modelling. It is simply by using the primitives at the tool bar. These primitives can be edited to the desired dimension and form. Package in form of a carton is just a cube or box. There is no stress in using cube primitive for the carton. In the study of Oladumiye, Oluyemi, & Adelabu (2018) on percentage distribution of form in respect of a typical tea package design, carton has been calculated to be the predominate above other forms like cup, bottle, pouch, tub, tin/can, Tetra Pak package system and to mention a few. Out of 7.8% of the identified package form for a typical tea, 6.5% are packed in carton while other package forms are below 6.5%. Hence, present study considers carton as the package form for a Zobo tea.

Also, prior researches have examined various measures for choosing an appropriate name for products. These researches itemize the criteria for good naming of products. Table 1 shows the criteria as elucidated by Chan and Huang (Chan, & Huang, 1997).

Product *onomastics* should suggest product benefits either consciously or unconsciously. This will promote the product brand in both product display and advertisement. Graphically, it should match the package design aesthetically. All aforementioned are the marketing criteria as put in to consideration by Chan and Huang (Chan, et al, 1997). Other criteria are the legal and linguistics aspect as itemized in Table 1. The notion of present study based on Chan and Huang's prescription is that Zobo tea onomastics either in generic or trademark form should follow marketing, legal and linguistics criteria as itemized in Table 1. Other marketing features includes its suitability with the product image and package form. This requires the graphic design expertise in collaboration with consumers' research. The consumers' mind needs to be understood by the designer. This also creates room for conceptual prototyping. This is one of the gaps present exploratory study fills by adopting the concept of using package form typical for a tea purposively for easy recognition or identification. This will remodel the inferiority of the aesthetics of Zobo indigenous products.

Table 1: *Measure for a good name (adapted from Chan and Huang, 1997, p.228)*

Marketing	**Legal**	**Linguistics**
Suggestive of product benefit	Unique	Easy to pronounce
Promotable		Pleasing sound
Advertisable		Easy to read
Persuasive		short and simple
Suited To Package		Positive without negative connotation
Fit With Product Image		Contemporary
		Memorable

The legal aspect is about the trademark ability of the onomastics. A unique name that will not easily become a dictionary word (generic word) should be used. Product onomastics should suggest product benefit as well as capable of persuading the consumers' purchase decision. Indigenous/ cottage/ locally produced Zobo tea, having possessed the good marketing features in the aspect of onomastics will be capable of good patronage in the international market. Stakeholders should understand that they cannot just give any name to their products. Cottage producer of Zobo tea will like to have his or her products to be consumed in the international market if digital divide will not be a barrier. The Zobo tea can be advertised on the internet. This is because e-commerce or e marketing can be adopted. The easy pronunciation, pleasing sound, readability, positive connotation of product name and to mention a few as itemized in Table 1 should be followed as to bring cottage indigenous products to an international market. Hence, present study attempts the harmonization of this criteria in to the African language in an English way by using linguistics word formation. The word length of a product onomastic should be short and simple. This will also help the designer to present the typography aspect in a more graphically appealing way. A product onomastics will be considered contemporary when it looks modern. The study of Blijlevens, Creusen, & Schoormans (2009) addresses product attributes in the aspect of modernity, simplicity and unity. Zobo tea onomastics can also argument these product attributes when the word length/appearance/ orthography is simple, short, modern, understandable (.i.e. meaningful without negative denotation or connotation) and memorable (.i.e. easy to recall or remember.) In a nut shell, present study also stand in the position of interdisciplinary research by attempting to collaborate graphic design with language studies, though in an elementary way.

2.1 Application of Computer Aided Design (CAD) Software for Graphic Communication

Design presentations have been enhanced with the virtual reality features in CAD and designers now have efficient environment to communicate their ideas. This has enabled them to easily interact with software that could help them actualize their various creative ideas. Designs are aided by computers with the medium of a software which is pre-installed in the computer (Ogunsote et al., 2006). In structural design, 2D and 3D Computer Aided Design (CAD) software are used for modelling. Virtual designs can be created or printed out through printing technology. 2D modelling software creates two dimensional designs (i.e. flat designs or designs that will show a simple view); 3D modelling software will present different views of a design. Various angle of the design can be seen with the aid of 3D modelling software. Examples are Cinema 4D, AutoCAD which are 3D CAD software for both animation, rendering and modelling. SOLIDWORKS and CATIA are developed by the same company; while CATIA is based on surface modelling, the inner parts modellings are done with SOILDWORKS. These 3D CAD softwares are popular 3D CAD softwares for developing mechatronics (.i.e.an integration of various engineering including robotics, electronics, computer science, and to mention a few) system from beginning to the end. Lumion is a visualization software for a rendering made-easy for architects. There is need for internet to use this software. Sketchup also uses internet. Someone in country that is negatively affected by digital divide will have the challenge of using this software unless the offline version is made available for them. This exploratory study will use both 2D and 3D modelling software so as to simulate Zobo tea package allied with product onomastics. Rendering software will simulate real scene, texture or environment for the design. It will help to add depth and animation or other real life effects to the design. It will show three dimensional designs (.i.e. design in round and not in flat). Animation software is based on a frame by frame basis. This will enable movement or

motion graphics to be created.

Vector software will not generate images that will pixelate (i.e. a kind of mosaic or dots that appear especially in enlarged images). Bitmap software can be called raster graphic software. The images generated with raster graphic software do pixelate (.i.e. form tiny dots of the images) especially when enlarged or magnified by using zoom tools. Presentation software have graphic user interface, translation and animation tools which can help a presenter in revealing or narrating their ideas to audience. Publishing software are useful for book design project for both online publication and printed copy of a publication design such as newspaper or magazine and to mention a few.

Table 2: *Shows some examples of CAD software*

Category	Examples of Software
2D & 3D modelling software	123 D Design, Cinema 4D, AutoCAD, SolidWorks, Autodesk Revit Building, ArchiCAD, TurboCAD, SketchUP, Lumion
Rendering Software	3D Studio Max, Cinema4D, ArchiCAD, AutoCAD, Form-Z, TurboCAD, CATIA
Animation software	3D Studio Max, Blender, Bryce, Flash, Ray Dream Studio, SoftImage, True Space, Maya
Vector software	CorelDraw, Adobe Illustrator
Bitmap software	Adobe PhotoShop, Microsoft Paint, Corel Photo Paint, MicroGrafx Pic
Presentation software	Microsoft PowerPoint, Harvard Graphics
Publishing software	Adobe PageMaker, Microsoft Publisher

For a design task, designer can decide to use one software or more. It depends on the level of proficiency of such designer. Present study does not prove its level of expertise in using Autodesk 123 D Design but it attempts a service training approach. This is a simulation of the experience an average graphic designer can face in the contemporary design in order to meet the needs of their clients. Clients have a very high expectation from a graphic designer. For instance, a client may believe that a particular graphic designer should be able to use Cinema4D or solid work for product development. Such a client may also expect the designer to create a unique brand name for the product as well. The belief of such a client can be that – 'a graphic designer is expected to be versatile in product branding task more than the client'. Whereas, such graphic designer can only use vector graphic software such as CorelDraw. Such a graphic designer can experience what this study attempts to document on conceptual Zobo tea package design prototype allied with product onomastics. This study is of the notion that Najmuldeen (2021) observation is correct because digital divide would affect a designer in an old economy country. Old economy country will affect the knowledge growth of a particular group. It is not a surprise that a designer in an old economy cannot use any of the 3D CAD software itemized in Table 2.

In the African continent, a designer who does not have access to good computer system and internet service have been affected by digital divide. Present study fills the gap of documenting the possibility of using open source and elementary software for conceptual prototyping for designers that are not affected or partially affected by digital divide. Digital divide is the setback in the economic growth of particular region lacking digital benefits such as good computer systems and to mention a few. By using reflection techniques, CAD software itemized in Table 2 can be classified in to two; namely, those that are less affected by digital divide and those that are more affected by digital divide. CorelDraw, Adobe

Photoshop and Microsoft power point will belong to the group that is less affected by digital divide because they are popular in the location where this study have been carried out. A designer in Nigeria may be proficient in using CorelDraw and Adobe Photoshop compare to Maya, 3D studio Max and to mention a few because of digital divide. Notably, AutoCAD is popular among structure designers such as builders, architect, and engineers. By reflection or intuition, there are avid learners among Nigerian graphic designers that are ready to be expert in using almost every CAD software but digital divide handicapped them. However, the influence of digital divide on designers is not the focus of this study. Autodesk 123 D Design, Adobe Photoshop and CorelDraw are suitable for exploring preliminary design ideas quickly and inexpensively in African, specifically Nigeria. So, 2D and 3D modelling software including vector and bitmap software are considered for the conceptual prototyping of the Zobo tea package considered in this study. This idea is also time-bound because of the changing economy and technology. In the nearest future, this idea may not be reckoned with. This exploratory study fill the gap of documenting this time-bound idea so as to enable future study to correct its weakness and build on its strengths towards better research outcome in product package design innovation. This will remodel the inferiority of the aesthetics of Zobo tea or another indigenous/cottage/locally produced products. It is believed that the outcome of this research could provide guidelines for effective naming in product package design for indigenous product development; as creative designers must not only understand the vocabulary of Graphic communication but should grasp interdisciplinary terms as well.

3. Method and Materials

The idea stage begins with the stage of the discovery of ideas in the form of concept useful as reference for the Zobo tea package design prototype allied with African indigenous *onomastics*. Concepts can be understood as a strategic rationale for achieving one goal. At this stage the first execution is to make observation and gather information. With the application of 5W + 1H (what, why, who, where, when and how) as the foundation of design thinking, the derivation of product onomastics are brainstormed and studied from prior researches. By using question applied brainstorming, how can linguistics techniques of word formation derive name for Zobo tea? The answer of the question 'how?' will also help to answer the question 'what?' – What are the brand names of Zobo tea representing African Indigenous *Onomastics*? By limiting the study to the survey consisting of data of the Non-Alcoholic Beverages' package designs collected between October 2016 and June 2018, there are no Zobo branded tea in the Nigerian Shopping Mall, though it was purposively sampled by Oluyemi & Oladumiye (2020). Based on mere reflection and intuition or observation, Zobo tea are sold as generic products mostly through hawking by children and some women. Biological study by Awe, Fagbemi, Ajibola, & Badejo (2012) narrated that Zobo is drunk not only in Nigeria but across Africa because of the antioxidant properties (.i.e. ability to prevent cell damage; this is a healthy benefit to the organs such as heart and to mention a few).

Why exploring Zobo tea product package allied with product onomastic? The significance of exploring product onomastics cut across in-service training techniques (.i.e. expanding the scope of ones knowledge in a practice) which designers are liable to face in contemporary design practice. The expectation of cottage business concerning what designers can do in terms of product innovation is not low. This is one of the rationales for collaborating conceptual prototyping with product onomastics. Some clients expect a graphic designer to design product package beyond 'just generic cottage or indigenous (local) product'. Cottage entrepreneur's expectation is that the graphic designer will designate the name for the product as well as create the visual design. These clients expect total package design from the designer. Their expectation is that a designer should be versatile in brand design expertise that will minimize the inferiority of indigenous

products. Notably, the study on graphic design in visual branding by Kirk (2013) refers to the possibility of designer's encompassing knowledge about product naming. This is one of the gaps this exploratory study fills by adopting the concept of using package form typical for a tea allied with its onomastics purposively for easy recognition or identification. This will remodel the inferiority of the aesthetics of Zobo indigenous products. This will serve as means of documenting this time-bound idea so as to enable future study to correct its weakness and build on its strengths towards better research outcome in product package design innovation. It is expected that in the future, Zobo tea will be in the international market like other non-alcoholic products (such as milk, coffee, and to mention a few that have several thousands of brands) in the world already.

The question 'Who?' is not new in any design process. The target audience or consumers are the crucial consideration of a design. Due to globalization, international consumers are considered. Hence, indigenous product onomastics considered in this exploratory study are not pure dialects but words fashioned in English Language. Lindstrom (2001) identified the relevance of English Language in translating information in a global language. This does not mean that English Language is the global language but one of the most popular languages in the world. In a question asked by a researcher 'What language do you most confident with?'- majority are most confident with English word on packaging design for Taiwanese souvenirs (Yang, 2018). The question 'Where?' does not have ambivalent answer. The world is now a global village; however, there is the challenge of digital divide. This exploratory study, though considered as indigenous African onomastics is considered in a global context by using both English and African words. The question 'When?' seems to have an ambivalent answer because of the trend of innovation in product brand design. As earlier stated this exploratory study also documents a time-bound idea so as to enable future study to correct its weakness and build on its strengths towards better research outcome in product package design innovation. It is expected that in the future, Zobo tea will be in the international market like other non-alcoholic products in the world already. Is it not surprising that the brand 'Cellophane' later become generic after many years of existence? Google become a verb 'google' (.i.e. to search the internet). Sometimes, consumers will refer to 'Coca-Cola' as 'Coke'. Now, the mistake will not be noticed when all soft drinks are called Coke. Having noticed that this happened to great product brands, the development of the indigenous Zobo tea beyond generic brand is necessary. Present study addresses contemporary product onomastics possible for a Zobo tea package design by considering the graphic appeal of the product name. Other features of a product name may become generic except the graphic appeal. By graphic appeal, this study refers to how the name appears appealing when printed on a product package. Below is the explanation for how the study explores product onomastics allied with product package conceptual prototyping.

Data are collected through both primary and secondary sources. Primary sources are obtained in the design studio while making use of 123 D Design, CorelDraw X5 and Adobe Photoshop CS5 to creating conceptual package design prototype for indigenous Zobo Tea. The secondary sources includes dictionary, journals, internet, and other literatures. By using Delphi techniques, the conceptual prototype package design allied with the *Zobo* tea indigenous *onomastics* are then displayed to the 5 anonymous participants for evaluation. A visual display (.i.e. monitor) is used as the instrument for showing the conceptual prototype package design allied with the *Zobo* tea indigenous *onomastics*. Figure 2 shows the beginning of the Autodesk 123 D Design software for generating the mockup for the indigenous Zobo tea package design.

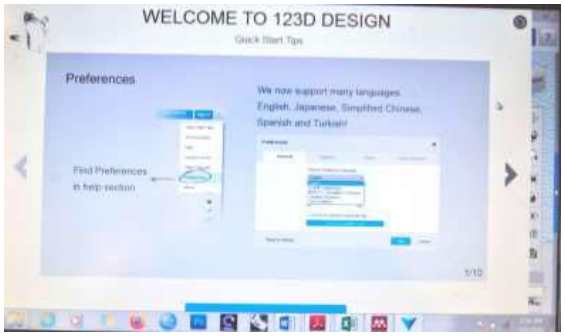

Figure 2: *The starting of the 123 D Design software*

The graphic interface environment in Figure 2 shows that 123 D Design software has the advantage of Language preference. It is available in many languages (English, Japenese, Chinese, Spanish and Turkish language). To proceed to the next stage the direction of the arrow should be used by just clicking on it. The stage will show the workspace environment where tools can be used for a design project.

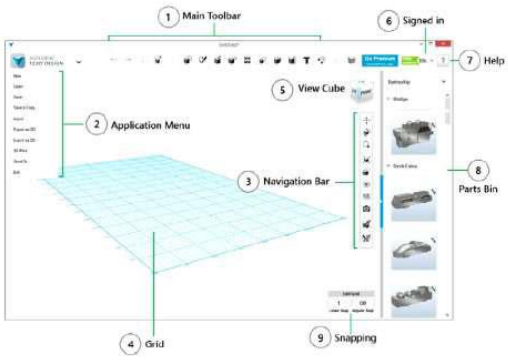

Figure 3: *Annotated picture of the features of Autodesk123 D Design graphic interface environment*

Figure 3 is the annotated picture of the features of Autodesk123 D Design graphic interface environment. The number one feature is the main toolbar. This consists of the primitives (i.e. building blocks of 3D basic geometric form). These primitives can be edited either by transforming or construction. The number two is the application menu consisting of new, open, save, save a copy, import, export as 3D or export as 2D, import and export files. Directly send the files to different applications or simply send to 3D Printer or to Online Print Service. The number three is the navigation bar which helps movement around the environment of the Autodesk 123 software. The number four is the grid which is the platform on which the model is built. It can be switched off or on by clicking it on the navigation bar. The number five is view cube; this is the easiest way to view different angles or sides of the model. The number six is the sign in, this is to go online. Design in Autodesk 123 software is available in both offline and online. The number seven is the help; this is for learning more about the product. The number 8 is the part bin where already made models are available. The number nine is snapping and is for ensuring precision setting for the model within the grid; it fits the model perfectly in a proper alignment.

Figure 4 shows how the package form for *Zobo* are generated by creating the carton for the Zobo tea in 3 dimensional solid form. There is no need of using the part bin because already made carton model is not made available probably because the design is done offline. Only the geometric shapes (such as cube and so on can be useful). Other models at the part bin includes numbers, letters, gadget, gear, hardware and lightning fixture.

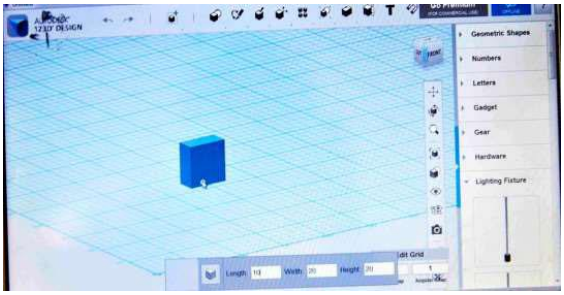

Figure 4*: Generating the package form for zobo*

By clicking on the cube primitive, the dimension in terms of length, width and height will show. Hence, further editing in terms of modifying the dimension and structure also starts as seen in Figure 5.

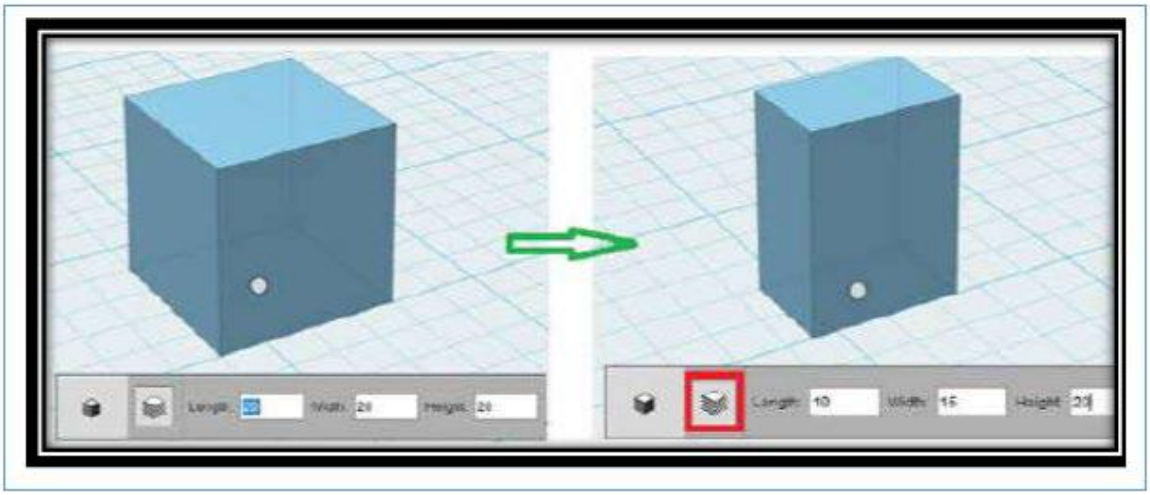

Figure 5: *Further editing in terms of dimension*

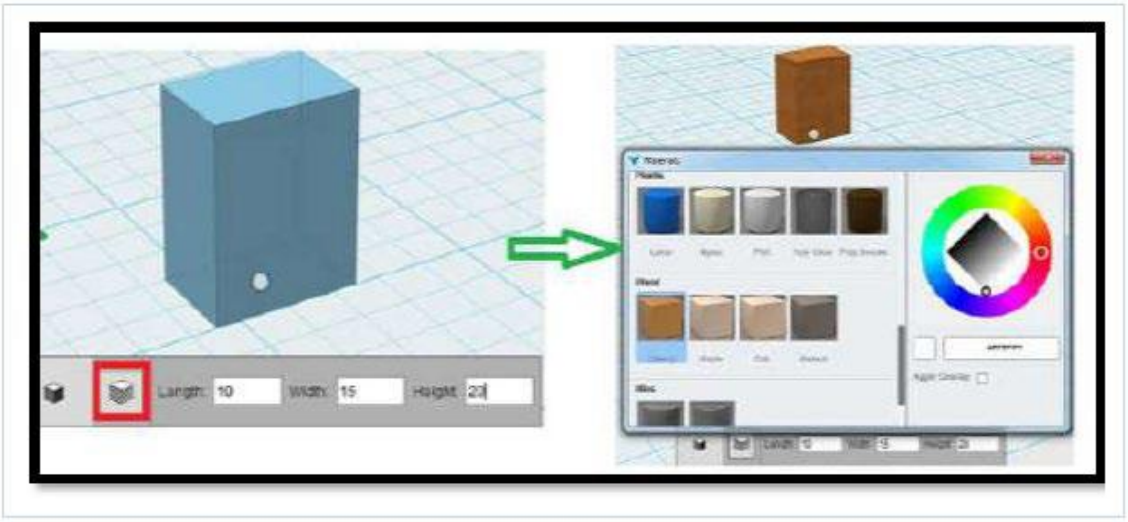

Figure 6: *Generating material for the package form*

Figure 6 includes the selection of material for the box/carton. The material has to be paper but there is none except wood. Other materials include PVC, nylon, and to mention a few. The next stage is to drag the primitive in to the material. Then, the colour and texture of the box is modified.

Rendering of the model is not adopted. The modified primitive in Figure 7 can be saved as 123Dx format. CorelDraw will not be able to open such files. The model is then captured by using snipping tool in the windows operating system. This is then opened in CorelDraw for further design. Figure 8 shows the snap shot of the generated package form saved for further design.

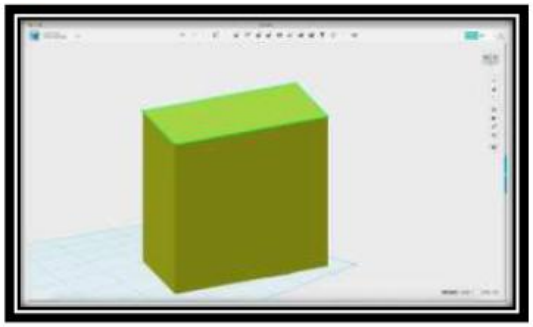

Figure 7: *The modified primitive*

Figure 8: *Snap shot of the generated package form saved for further design*

The generated package form is opened in CorelDraw X5 for further design. There is no capability of using Autodesk 123D Design for pattern creation; hence, CorelDraw X5 has been used for colour application.

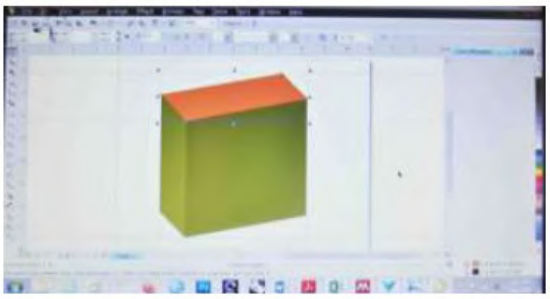

Figure 9: *Application of orange colour in CorelDraw X5*

An elementary software like Autodesk 123D Design would have been excellent if all the design processes can be completed without collaborating or transferring the carton to CorelDraw. Orange colour have been added in Figure 9. The colour of the top of the carton has been transformed to orange. The package design elements such as images, and captions are also included with the indigenous Zobo tea in CorelDraw X5. A rectangle filled with orange colour have been laid on the carton. Two more rectangles are also filled with yellow and placed on the box (carton).

All these have been done by putting perspective in to consideration. 'ZOBO' which is a generic Nigerian name for Roselle or hibiscus have been positioned in perspective aligned to the box. The text is in white colour (see Figure 10). Adobe Photoshop works with layers; present stage of the design would have been in layers in Photoshop. The text wrapping tools and other free editing tools in Adobe Photoshop have assisted the placing of the text and images. Meanwhile the *onomastics* for indigenous *Zobo* tea have been derived through linguistics techniques of word formation. This will be explained in successive pages of this paper (see Table 3).

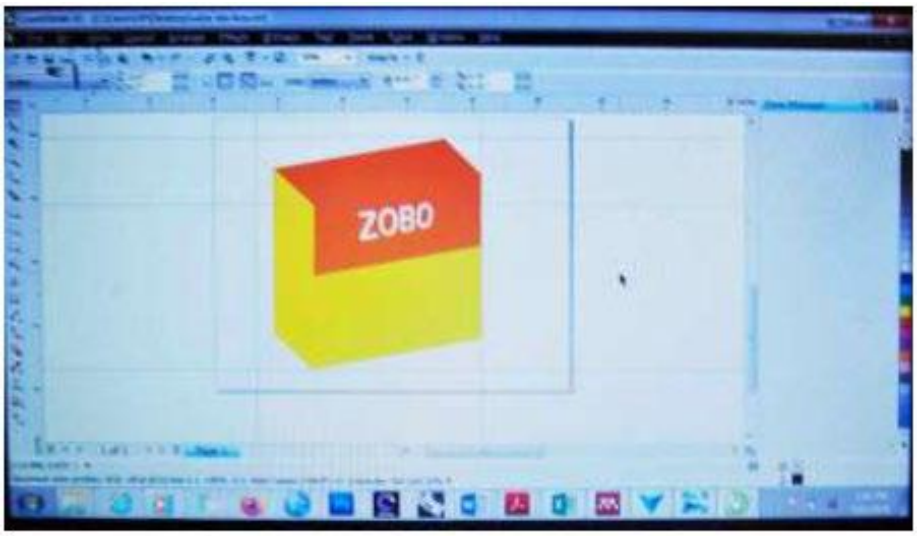

Figure 10: *Yellow colour applied as well as the text are positioned in perspective*

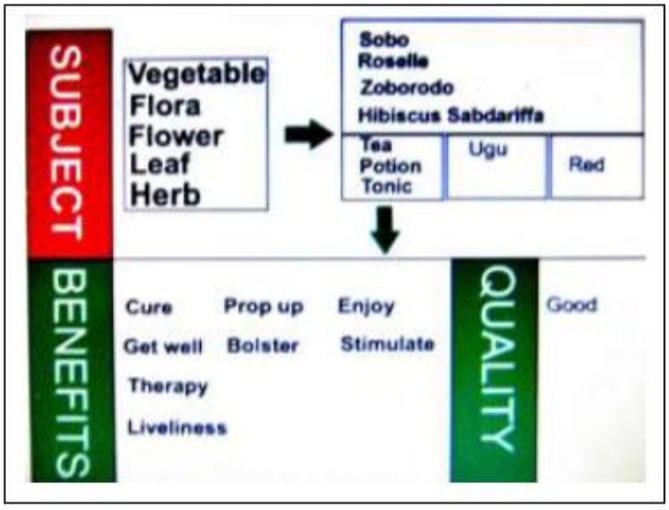

Figure 11: *Semantic plan of typical indigenous Zobo tea*

2.2 Application of Zobo Tea Onomastics

Tea is a non-alcoholic beverage which have the qualities of thirst quenching, stimulating, refreshing and nourishing. Tea plant originated in China; and the names are normally derived from shape of the leaf, its colour, scent, or flavor and other features (Chen, 1981). Naming of Tea has been problematic because there are different types of tea (Leo, 2020). In the naming of tea, the name of the cultivator, association of the appearance, description of the shape, production process, regional name, history, added aroma, and combination name may be applied (Leo, 2020).

Before applying linguistics techniques of word formation, the first approach is to look for words that would semantically fit the subject, quality and benefits of a typical tea. Bearing in mind that names are symbols of identities, present study identifies the *Zobo* tea as vegetable, shrub, flora, flower, leaf or herbs. This indigenous tea is present in almost everywhere, hence critics might oppose the word 'indigenous' as used in this paper. It is noteworthy that zobo is peculiar to Central and West Africa. It has been presented as indigenous in this paper because it has unique names in various locations and they are locally produced in Africa. Perhaps, present industries just began industrial production of the Zobo tea but it is not yet trendy in Africa. In Ghana, it is called Zobolo; Agua de Jamaica in Jamaica, and Bissap in Senegal. Roselle, Florida Cranberry, Red sorrel, Jamaica sorrel and lots more in other parts of the world.

The Zobo tea is an indigenous tea called *zobo (zoborodo)* in the Hausa language. It is an edible plant called Hibiscus *sabdariffa*; it can also be called Roselle. In terms of the subject being studied, it can be tea, portion of drink, or tonic. The colour is reddish; hence, red can be another semantic association. The word 'Ugu' is an indigenous name for vegetable (here, it is arbitrary because it does not relate to the subject but it can be useful in the naming process). In terms of product benefits or quality, *Zobo* is refreshing, therapeutic, curative, and stimulating; hence the following words were discovered to be semantically similar to *Zobo* tea; namely, 'cure', 'get well', 'therapy', 'liveliness', 'prop up', 'bolster', 'enjoy', 'stimulate' and 'good' quality. The aforementioned explanation for brainstorming words fit for indigenous zobo tea can be seen in Figure 11. The subject is what we are naming; that is the *Zobo* tea. It can still be traced to the groups of vegetables, flora/flower, leaf, herbs and to mention a few. Thinking out side the box is necessary; so, arbitrary names related and unrelated are adopted. The benefits of the Zobo tea in terms of cure, getting well, therapy, liveliness, refreshingness, enjoyment, stimulation and to mention a few are put into consideration.

The quality of the Zobo tea are put in to consideration. All these semantically generated words are used in the linguistic word derivation by using various techniques such as reduction, addition, direct burrowing, synonyms, compounding, semantic association, replacement techniques, eponyms, re-arrangements and to mention a few (see Table 3) .

From the study of *Oluyemi* and *Oladumiye*, alphanumeric, descriptive, eponyms, fanciful, generic, homonyms, toponyms, and suggestive names are the common *onomastics* for the branding of tea (Oluyemi, & Oladumiye, 2020). Hence, present study, derives names for indigenous *Zobo* tea by building on the body of knowledge gained from the aforementioned study. Table 3 shows the derived names for the indigenous *Zobo* tea which consists of six generic, five suggestive, four descriptive, three homonym, two eponym and two fanciful onomastics. The total number of the derived names for the indigenous Zobo tea is all together 22.

Generic names are household names or those that are well known either by everybody or some set of people. Examples of these names may also be derived easily by reduction, addition, direct borrowing from other languages and the use of synonyms.

The reduction techniques for obtaining the name '*Zobo*' involves the removal of the suffix '*rodo*' from the word '*Zoborodo*'. Also, 'Hibiscus' was derived by removing the specie name '*sabdariffa*' from 'Hibiscus *Sabdariffa*'. Likewise, when the genus name' Hibiscus' is removed, the name '*sabdariffa*' was formed for the indigenous tea. In the botanical of Hibiscus, '*sabdariffa*' is used as the name of the specie. The addition of suffix '-al' to 'Herb' obtained the word 'Herbal'. '*Roselle*' is

Table 3: *Derived names for the indigenous zobo tea*

Derived Names for *Zobo* Tea	Onomastics	Techniques
Zobo	Generic	Reduction: *zoborodo - zobo*
Hibiscus	Generic	Reduction: hibiscus *sabdariffa - sabdariffa*
Herbal	Generic	addition of suffix: herb + -al
Zoborodo	Generic	Direct Borrowing from Hausa language
Roselle	Generic	Synonym of 'hibiscus'
Sabdariffa	Generic	Reduction: hibiscus *sabdariffa* - hibiscus
Ogood	Suggestive	*Ugu* + good = *ugood* = *ogood*
Leaf Cure	Suggestive	Compounding: leaf + cure
Tonic Cure	Suggestive	Compounding: tonic + cure
Tonicare	Suggestive	Reduction: tonic - care
Enjoyz	Suggestive	addition of suffix: enjoy + s = enjoys = *enjoyz*
Therapist	Descriptive	addition of suffix: therapy+ist = therapist
Red Flower	Descriptive	Compounding: red + flower = red flower
Prop Up	Descriptive	Semantic association
Get Well	Descriptive	Semantic association
Zoboh!	Homonym	Addition of Suffix: *zobo* + *oh!* = *zoboh!*
Sorboz	Homonym	Replacement Techniques: *sorbose* = *sorboz*
Oh! Dun	Homonym	Borrowing from Yoruba: *o dun* = *oh! Dun*
Mrs. *Roselle*	Eponym	Addition of Title: Mrs + *Roselle* = Mrs *Roselle*
Dr. Therapy	Eponym	Addition of Title: Dr + Therapy = Dr. Therapy
Nipton	Fanciful	Re-arrangement: potion = *nipton*
Herbolster	Fanciful	Reduction Techniques: Herb + bolster

a synonymous word for 'Hibiscus'.

Suggestive name indirectly describes a product. '*Ogood*' suggests the quality of the tea (.i.e. good tea). This depends on the mental schemata of the intending consumers. Compounding of 'leaf' and 'cure' as well as 'tonic' and 'cure' derived the name 'Leaf Cure' and 'Tonic Cure' respectively. '*Tonicare*' was obtained through reduction while '*Enjoyz*' was obtained through addition of suffix 'z'. Descriptive names directly describe a product. The addition of suffix, compounding, and semantic association are used for the indigenous tea *onomastics*. 'Therapist' was derived from the addition of 'therapy' to the suffix 'ist'. 'Red Flower' was derived through compounding of 'Red' and 'Flower'. Semantic association was adopted for deriving 'Prop Up' and 'Get Well' as name for the indigenous zobo tea.

Homonyms are either homograph or homophone. Based on the *onomastics* for indigenous *zobo* tea, addition of suffix, replacement techniques, and borrowing from indigenous languages have been adopted. '*Zoboh*!' is derived from the addition of '*Zobo*' and 'Oh!' while '*Sorboz*' was derived through replacement techniques. 'Oh! Dun' was derived from borrowing from the Yoruba language (Nigerian language) the word '*o dun*'.

Eponym personifies the product as the name of a person. Addition of title have been adopted. 'Mr *Roselle*' and 'Dr Therapy' are derived from the addition of title 'Mr.' and 'Dr.' to the word 'Roselle' and 'Therapy' respectively. Fanciful names are coined names formed to represent the product. Re-arrangement technique is used for deriving '*Nipton*' by transforming 'Portion' to '*Nipton*'. By using reduction technique, '*Herbolster*' is formed by removing the double 'b' in the combination of 'Herb' and 'bolster'.

Also, a modified Delphi technique is applied to evaluate the conceptual prototype package design allied with the *zobo* tea indigenous *onomastics*. This means that the derived names for the indigenous zobo tea are designed on the conceptual package design prototype and then evaluated. Based on modified Delphi model, five Delphi participants are purposively selected. These participants are anonymous and they have a good understanding of product package design and *onomatics*.

Likert scale of 5 to 1 is adopted for the evaluation of the conceptual prototype package design allied with the *zobo* tea indigenous *onomastics*, where 5 = Excellent, 4 = Good, 3 =fair, 2 = poor, 1 = bad. The anonymous participants are to rate the conceptual prototype package design allied with the zobo tea indigenous onomastics based on the variables shown in table 4. There are 14 variables in all (V1 to V14). The result of the evaluation is then statistically presented by using bar chart.

A graphically appealing product name is considered to be well copy fitted to the packaged design in terms of aesthetics, typography, and layout orientation (arrangement). Also, the length of word could assist the aesthetics and simplicity of the design. Easy understanding and pronunciation of the word have been considered by prior researches to be important for the friendliness of the product brand. The distinctiveness of the word in terms of been easy to remember and entirely different from any other names are necessary while designing new brands. Product names that are attention grabbing and advertise-able could be persuasive. Also, the aforementioned assist the trademark-ability of the brand. According to prior researches such words are far from common nouns (generic *onomastics*).

Table 4: *Example of variable (VAR) for the evaluation of the conceptual prototype package design allied with the zobo tea indigenous onomastics*

VAR	STATEMENTS	Excellent	Good	Fair	Poor	Bad
V1	The product name is graphically appealing					
V2	The length of word is of appropriate length					
V3	Easy understanding					
V4	Easy pronunciation					
V5	Distinctive enough to be remembered					
V6	Distinctive enough to be differentiated from other similar products					
V7	The product name is attention grabbing					
V8	The product name is advertise-able					
V9	The product name is persuasive					
V10	The product name is capable of serving as a trademark					
V11	The product name is free form negative connotation					
V12	The product name fit the package design type (i.e. shape)					
V13	It is capable of arousing consumers' emotion					
V14	It is modern/contemporary - (not too local)					

3. Result and Discussion

Based on the findings of this study, some hypotheses are generated. This involves the typicality of product onomastics as regards the adopted non-word/ word derivation techniques. Recall that the notion of this study also includes the concept of aligning product attributes to the concept of typicality/congruity (.i.e. standard or what is used predominately; they are attributes that is believed consumers will be most confident of its attributes). Based on the relationship between the typical onomastics assumed for Zobo tea (namely, generic, suggestive, descriptive, homonym, eponym, and fanciful) and the linguistics techniques (.i.e. non-word/word formation techniques) present study notices the hypothesis that there is freedom for using any linguistics techniques to designate product onomatics despite product typicality consideration.

3.1 Inference from Derivation of Names for Indigenous Zobo Tea by making use of linguistics Techniques

Figure 12 displays a stacked area chart highlighting the trend of the possibility of Zobo tea product onomastics to becoming generic. The blue area represents generic onomastics; it has the highest popularity/typicality. In Figure 12, generic onomastics are not derivatives of compounding, semantic association, replacement, addition of suffix, and re-arrangement techniques. Following the hypothesis, can these five techniques be used for generic onomastics and still remain typical for Zobo tea? Or generic onomastics typical for Zobo tea should be designated by using reduction, addition of suffix, direct borrowing, and synonyms only?

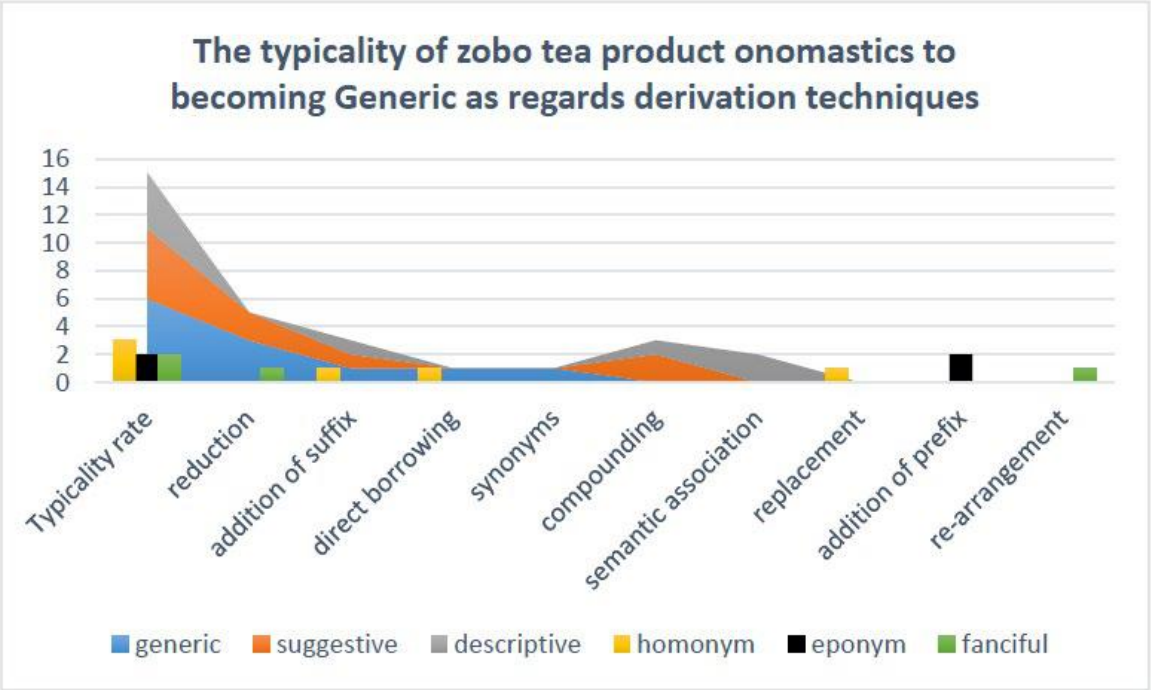

Figure 12: *the trend of the possibility of zobo tea product onomastics to becoming generic*

So, it covers more area from reduction to synonyms; can it be that the use of techniques ranging from compounding to re-arrangement will make generic onomastics far from a dictionary word (.i.e. less generic)? It can be inferred that most of the categories are derived from a generic terms. For instance to derived names for Zobo tea different from the already derived ones in Table 3, *Dr + Zobo* = '*Dr Zobo*'; *Nutri + zobo* = '*Nutrizobo*' (.i.e. addition of prefix) will generate eponym and suggestive names respectively; Zobo re-arranged as '*Ozbo*', '*Bobz*', '*Oobz*', and '*Zoob*' will generate fanciful names or non-word irrelevant names. It can be opined that addition of prefix and re-arrangement will not lead to generic onomastics. Research and collection of various generic terms are the beginning of naming process for a Zobo tea. These terms can then be transformed to other onomastics such as suggestive, descriptive, fanciful names and to mention a few.

Suggestive onomastics are not derivatives of synonyms, direct borrowing, semantic association, replacement, addition of suffix, and re-arrangement techniques in figure 12. Following the hypothesis, can these six techniques be used for suggestive onomastics and still remain typical for Zobo tea? Or suggestive onomastics typical for Zobo tea should be designated by using compounding, reduction, and addition of suffix only? In Figure 12, the orange area represents suggestive onomastics; it is the next in popularity/typicality after generic onomastics. So, it covers area from reduction to compounding; can it be that the use of techniques ranging from semantic association to re-arrangement will make suggestive onomastics less suggestive? For instance, *Prop Up = Go + Higher = GoHigher* (.i.e. semantic association/compounding); '*Zobo*' + '*Bissap*' = '*Zobossap*' (.i.e. direct borrowing from Senegal with addition/blending technique). Direct burrowing will still make the product generic except when it is changed to another name by the use of other derivation techniques (i.e. '*Bissap*' changed to '*Zobossap*'). The Zobo at the prefix will be an anchorage for suggesting '*Zobossap*' to be a Zobo drink. '*Zobossap*' is a non-word that can sound relevant to Zobo drink. The use of synonyms .i.e. *Hibiscus = Sorrel = Roselle = Zobo =*

Zoborodo = *Zobolo* and to mention a few will still make it generic. There is need to change them to another name by the use of other derivation techniques.

It can be inferred that combination of various derivation techniques are needed to a form typical onomastics far from genericity for a Zobo tea. In Figure 12, the grey area represents descriptive onomastics; it is the next in popularity/typicality after suggestive onomastics. Reduction, direct borrowing, synonyms, replacement, addition of prefix and rearrangement are not used for the derivation of descriptive onomastics as seen in Figure 1 Synonyms should be able to derive descriptive names; for instance, Rich tea = Fine tea = Fruitful = Prolific = Bountiful are descriptive. It can be inferred that not all derivation methods can be used to obtain descriptive names. Reduction, direct borrowing, replacement, re-arrangement, and addition of prefix will rather generate suggestive than descriptive onomastics. The yellow area represents homonym; it is the next in popularity/typicality after descriptive onomastics as seen in Figure 12. Reduction, synonyms, compounding, replacement, semantic association, and addition of prefix are not used for the derivation of descriptive onomastics as seen in Figure 12. Direct borrowing, replacement, re-arrangement, and addition of suffix are used for deriving homonyms. Addition of prefix with the use of direct borrowing from other languages like '*Mun*', '*Sha*', '*Nuo*' means 'drink' in Yoruba, Hausa and Igbo respectively should be able to form homonym; however, it depends on culture/tribe. '*Munzobo*' = '*Mun*' + '*Zobo*' (Munzobo is a name of person in a particular tribe. Accidentally '*Munzobo*' drink will be eponym to someone in such region whereas it was formed as homonym in another region). In English language translation, 'Munzobo' means '*Drinkzobo*'; '*Shazobo*' = '*Sha*' + '*Zobo*'; '*Nuozobo*' = '*Nuo*' + '*Zobo*' ('*Shazobo*' and '*Nuozobo*' also mean '*Drinkzobo*'). The traditional language of a particular tribe will determine if a word is homonym or not. Based on global consideration, what is homonym in Nigeria may not be homonym in another country. It may be meaningless to another human being. The most important criteria in such situation is that it must not have negative connotation. In Figure 12, addition of title is used for deriving eponym. The title added is still a form of prefix. Earlier, eponym is formed accidently from the incorporation of direct borrowing and the addition of prefix. It can be inferred that it is more possible for addition of suffix to form homonym while it will be more possible for addition of prefix to form eponym; however, it may be still homonym to somebody from a particular tribe.

The black area represents eponym; it is the next in popularity/typicality after homonym as seen in Figure 12 while the green area represents fanciful onomastics; it is the next in popularity/typicality after eponym onomastics. Fanciful names are derived through the use of re-arrangement and reduction techniques in Figure 12. This is does not mean that other derivation techniques cannot be used. For instance clipping and reduction can be used. Zobo can be reduced to '*Zob*' (.i.e. reduction), '*Zobo*' + '*late*' = '*Zobolate*', '*Zobo*' + *rich* = '*Zoborich*', '*Nutri*' + '*Zobo*' = '*Nutrizobo*' (.i.e. addition of suffix and addition of prefix respectively), '*Nutrizobo*' – '*triobo*' = '*Nuz*', '*Zoborich*' - bo = '*Zoch*' (.i.e. clipping). There is need for the combination of derivation techniques to form fanciful names. Suggestive names are formed when the addition of suffix and prefix are used. Further use of clipping transformed the suggestive names to fanciful names .i.e. '*Nuz*' and '*Zoch*'. Both can still be further transformed through replacement technique to 'Nus' and '*Soch*'.

Product onomastics for a Zobo tea or other products cannot be done without proper research; the task is highly demanding. This is similar to the declaration of Kohli & LaBahn, (1997) that the process involved in product naming can take months or years to complete. Some key steps include specifying the objectives of the branding, developing the product name itself, evaluating names through target market testing and focus groups, choosing a final product name, and finally

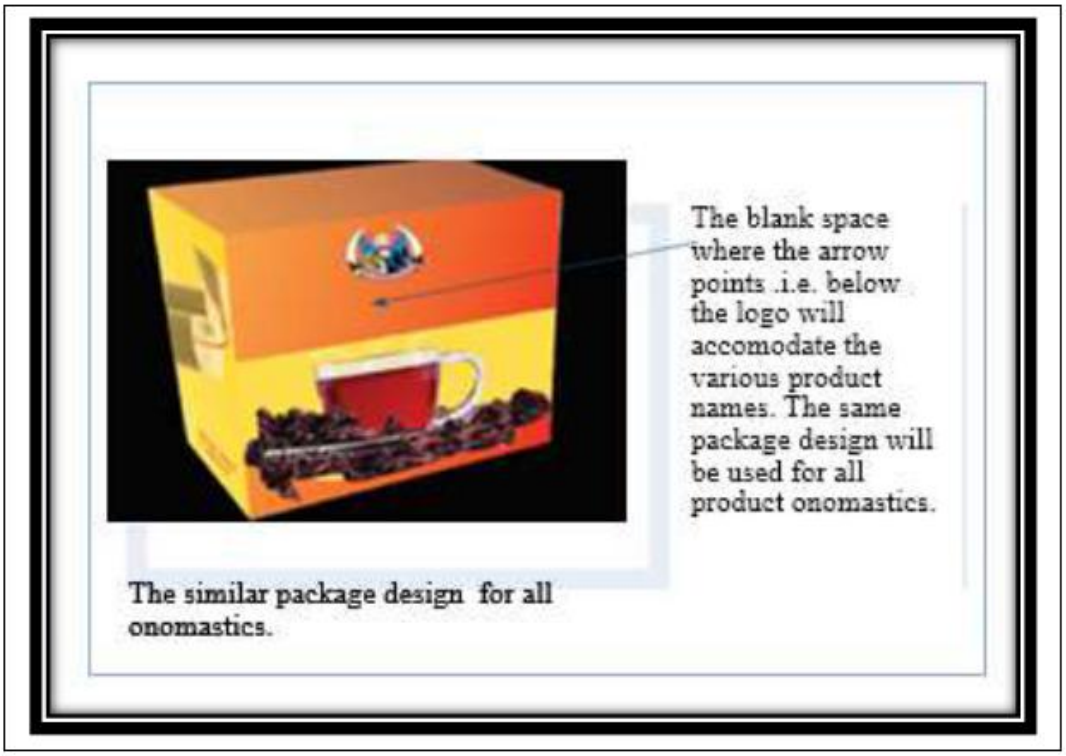

Figure 13: *the similar package design and the blank space for the derived Zobo names*

identifying it as a trademark for protection. The use of a relevant generic term either at the prefix or suffix will be an anchorage for suggesting a Zobo drink. Research and collection of various generic terms are the beginning of product onomastics for a Zobo tea. It can be opined that addition of prefix and re-arrangement will not lead to generic onomastics; however, most of the onomastics categories are derived from a generic terms. These terms can be transformed to other onomastics such as suggestive, descriptive, fanciful names and to mention a few.

It can be inferred that it is more possible for addition of suffix to form homonym while it will be more possible for addition of prefix to form eponym; however, it may be still homonym to somebody from a particular tribe. The traditional language of a particular tribe will determine if a word is homonym or not. Based on global consideration, what is homonym in Nigeria may not be homonym in another country. It may be meaningless to another human being. The most important criteria in such situation is that it must not have negative connotation. Notably, the combination of various derivation techniques are needed to a form typical onomastics far from genericity for a Zobo tea.

3.2 Evaluation of the Conceptual Package Design for Zobo Tea Allied with Product Onomastics through the Delphi Techniques

It is worthy of note that the package designs were created in similar colour, typography, image logo and other elements are also the same because of constant condition (see Figure 13). Only the names will be changed but other design variables will be similar. The variables considered are restricted to the product name and typical package design. This has been done in order to avoid noise or extraneous elements in the findings. Similar studies by Pamungkas, Shrum, Keller, Schmidt, Malik and Olateju to mention a few are purely linguistic based (Pamungkas, & Abdulah, (2017), Shrum, Lowrey, Luna, Lerman & Liu (2012), Keller (2013), Schmidt, (2011), Malik (2015), and Olateju, Akande & Akinwale, 2009)

.

Figure 14: *conceptual prototype package design allied with the zobo tea indigenous onomastics .i.e. Therapist (Eponym), Red Flower (Descriptive), Dr Therapy (Eponym), Get Well (Descriptive)*

Figure 15: *Conceptual prototype package design allied with the zobo tea indigenous onomastics.i.e. Zoborodo (Generic), Roselle (Generic), Tonic Cure (Suggestive), Zobo (Generic),Herbolster (Fanciful), Enjoyz (Suggestive), Nipton (Fanciful), Mrs Roselle (Eponym), and Sorboz (Homonym)*

Figure 16: *Conceptual prototype package design allied with the Zobo tea indigenous onomastics.i.e. Ogood (Suggestive), O!Dun (Homonym), Zoboh (Homonym), Leaf Cure (Suggestive), Sorboz (Homonym), Herbal (Generic), Tonicare (Suggestive), Saabdariffa (Generic), and Hibiscus (Generic)*

They only laid emphases on the techniques of naming; hence present study creates conceptual prototype package design allied with the *Zobo* tea indigenous *onomastics* by adopting Delphi techniques for the evaluation of the 22 conceptual Zobo tea package design. The aspect of graphic appeal and the fitness of product name to package shape are incorporated in to the evaluation because of the product name are evaluated in the environment of the Zobo tea package design. The product names are not evaluated in isolation from product package design (i.e. salient salesman). This makes the present exploratory study different from prior research by Pamungkas, Shrum, Keller, Schmidt, Malik and Olateju. Therefore, a blend of marketing, legal, linguistics and design criteria are used for the evaluation of the conceptual Zobo tea package designs in Figure 14 to Figure 16. Figure 14 to Figure 16 show the conceptual prototype package design allied with the zobo tea indigenous onomastics.

Through Delphi techniques, 22 derived names for indigenous zobo tea which are six generic, five suggestive, four descriptive, three homonym, two eponym and two fanciful onomastics are evaluated by the anonymous participants and the results showed that homonym is the most suitable for the conceptual prototype package design allied with the *zobo* tea indigenous (see Figure 17 for the bar chart showing the result of evaluation based on Delphi techniques). Figure 18 shows the homonym (i.e. OH!DUN) designated and used as label for the indigenous *Zobo* tea carton (package design). This has been selected to be the most suitable among the 22 derived names for the conceptual prototype package design allied with the *Zobo* tea indigenous. It is rank as the most appropriate because it has overall mean score of 3.8, which can be approximated to

4.0. Point 4 on the likert scale means OH!DUN is good as the label for the name of a typical Zobo tea conceptual package design. On the 5 point Likert scale, it assumed that the selected name is excellent while point 4 is good for the labelling of indigenous tea. It is a surprising

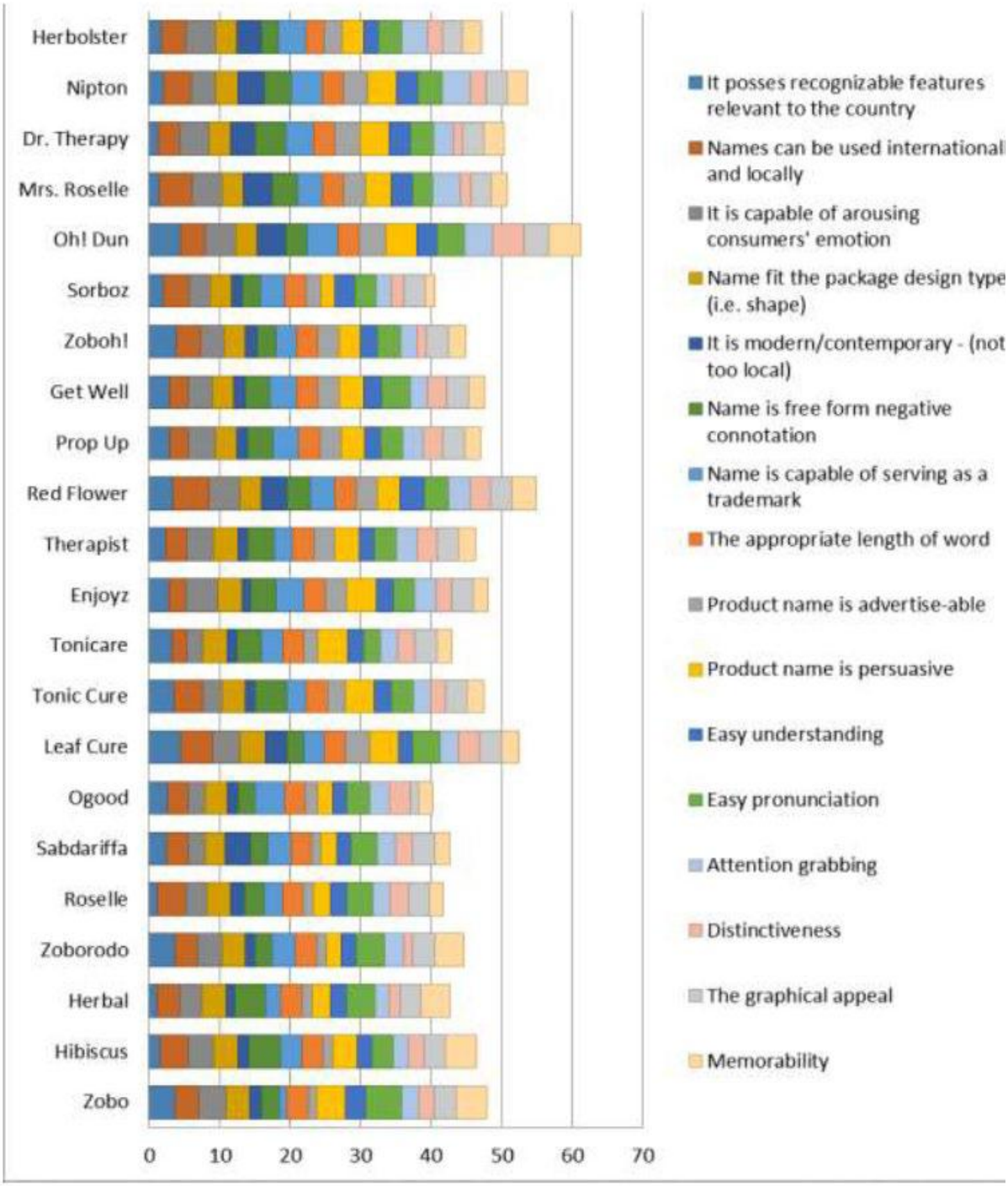

Figure 17: *The bar chart showing the result of evaluation based on Delphi techniques*

that an excellent product onomastics is not discovered in the study but a good product onomastics.

The evaluation criteria used for the evaluation of the conceptual prototype package design allied with the Zobo tea indigenous onomastics showed that 'OH! DUN' is a name which has recognizable features relevant to indigenous location (.i.e. Nigeria). The Likert scale of this variable is 4.5 (.i.e. excellent). Due to globalization, the evaluation of the name 'OH! DUN' has a Likert scale of 3.5 (.i.e. good) which means it can be international and locally used. The name is capable of arousing consumers' emotion on the Likert scale of 4.4. However, the name fairly fits the shape of the package design with a Likertscale of 3. Probably because of the shortness of the length. It is also capable of serving as a trademark on scale of 4.4. It also has the following good characteristics, namely: memorability (4.5), graphic appeal (3.5), distinctiveness (4.5), attention grabbing (4.0), understanding (3), pronunciation (3.8), and persuasiveness (4.3). The mean rating of the evaluation of the name 'OH! DUN' as a homonym onomastics is 3.8. Hence, homonym is preferable as Zobo tea indigenous onomastics among others such as descriptive, eponyms, fanciful, generic, and suggestive names.

4. Summary and Conclusion

Product *onomastics* will enhance branding and development of the indigenous product especially zobo tea. As part of the contribution to knowledge, this study identifies homonym as a naming styles. This is not enough to prove that they are the best fitting naming styles for indigenous zobo tea. Various derivation techniques can be combined so as to get befitting names that will serve as a good trademark and as well as persuasive to consumers in the international market. More researches are needed before an excellent product *onomastics* can be designated for an indigenous product. A new economy that will benefit designers positively in the aspect of adequate digital amenities is necessary for better product package innovation and development in Nigeria, especially for the

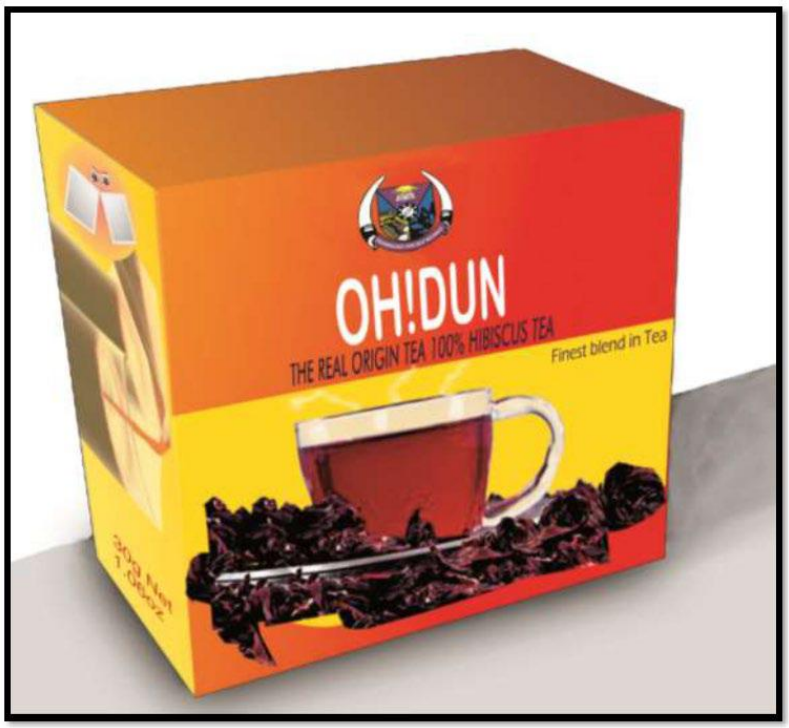

Figure 18: *The desirable product onomastics (homonym) for indigenous Zobo tea conceptual package design*

university students studying design related courses. Both elementary (i.e. easy to use CAD software) and advanced CAD software should be made available for both students and lectures that specialize in design related profession in developing countries. CAD software programmer and industry should put the third-world countries into consideration while designing CAD software by making the software to be compatible with less sophisticated computer as well. Graphic design should not be limited to pictures, images, layout, typography, and other visual aspect of package design. Present study has shown an example of creative ways graphic designers can harness the theories of other disciplines to a design studio practice. There is need for further study even in a similar way to prove right or wrong the hypothesis discovered in the findings of this exploratory study. As this study only discovered homonym to be good for Zobo tea package design, proper research will still establish the excellent product *onomastics* to be the most appropriate. Hence, research on the choice of appropriate name for a particular product should be a contemporary research area because of its latent effectiveness and significance for successful package design which needs to be unfolded further. This will go a long way in improving the present situation of indigenous products and graphic design in terms of branding and product development. The conceptual prototype package design allied with the *Zobo* tea indigenous *onomastics* is assumed to be visually pleasing, attractive and good example for our indigenous products. Accordingly, graphic design training institution should encourage the harnessing of multidisciplinary perspective with the graphic design profession because of clients' high expectancy and the need to expand the scope of graphic design for the purpose of job opportunities for future designers.

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Conflict of Interest
We declare that we have no conflict of interest.

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Dialogical Structure Experience in Basic Design Studio at Online Education

Derya Adiguzel Ozbek
Department of Interior Architecture and Environmental Design, Istanbul Kultur University, Istanbul, Turkey

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D. Adiguzel Ozbek ORCID: 0000-0002-6607-0103

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Abstract: In this study, the structure of the basic design studio that started with face-to-face education and had to end with online education due to the COVID-19 pandemic, which was set over Bakhtin's dialogic concept, is discussed. The three main components of the basic design studio; studio space, studio process and studio content and the combination of these components have changed in the transition from face-to-face education to online education. With these changes, dialogic relations are defined in the basic design studio's setup that extends from the face-to-face to the online education, and a structure that is shaped not as a sharp transition but as a flow has been developed. The basic design studio structure, which is shaped by the concept of dialogue, is presented as an approach proposal for online education, which is still ongoing and is expected to continue.

Keywords: Basic Design Studio, Face-to-face Education, Online Education, Dialogic, COVID-19 Pandemic

1.Introduction

The first year of architecture, fine arts, art, and design faculties is the place where creative and abstract thinking is first encountered. For this reason, the first-year education has a special importance and privilege. The basic design studio, which is the main element of the first-year education, is involved in the education of all disciplines dealing with different scales of the design field. The basic design studio is a process in which abstract and conceptual thinking is transferred through problem solving action.

The basic design studio is maintained with an understanding that is a continuation of the tradition that has been going on since the Bauhaus school. This understanding has recently started to diversify with different studies in the digital education environment and educational pedagogy (Sarıoğlu Erdoğdu, 2016). But its focus remains; How can students gain creative and abstract thinking skills in the first year?

Abstract, conceptual and creative thinking skills, which are at the center of the basic design studio, are a process that develops with the interaction and communication of the teacher and the learner by experimenting, doing and even using hands (hands on) (Özkar & Steino, 2012) (Sarıoğlu Erdoğdu, 2016). Due to the content, process and method of the basic design studio, the transition to online education with the COVID-19 pandemic represents a more complex situation. With the quarantine measures, the studio has been tried to adapt to the online education approach with a very quick planning. The experience and practice-oriented nature of design education makes it difficult to adapt studio courses to online processes.

A new experience has begun for both the teacher and the learner in the transition from face-to-face education to online basic design studio training. In 2019-20 Spring semester, at A…. University, a structure based on Bakthin's dialogic concept has been designed as a tactic against both the sharpness of the process and the foreign nature of online education in the Basic Design II studio, which is mandatory in the education plan of the Department of Interior Architecture and Environmental Design.

The concept of dialogic, whose etymological origin is based on dialogue (Yıldız, 2014), and which we can call the science of dialogue, is the state of production in which the channels of communication and interaction are used in a flow, without turning to absolute goals, in the coexistence of differences (Adıgüzel Özbek, 2020). With these extents, dialogic learning is a method of progress by knowing that each shared dialogue triggers new thinking and cognitive processes.

The three main components of the basic design studio; studio space, studio process and studio content and the combination of these components have changed in the transition from face-to-face education to online education. With these changes, dialogic relations are defined in the basic design studio's setup that extends from the face-to-face to the online education, and a structure that is shaped not as a sharp transition but as a flow has been developed. The aim of this study is to present an alternative for the online studio approach by opening this structure to a miscellaneous discussion. In studies dealing with design studios, conducting the narrative or discussion through student studies creates an open sharing environment and provides a forward-looking archive. The focus of this work is the studio structure. Student works, which are studio outputs, are referred to as a component of the dialogic basic design studio structure. Furthermore, some more outsider parameters such as student experiences and other courses that affect the basic design course are outside the scope of this study.

2. Basic Design Studio Structure in Face-to-face Education

Under the current conditions at A University, Basic Design I and Basic Design II courses, which are compulsory in the fall and spring semesters of the first year education of the Department of Interior Architecture and Environmental Design, are handled holistically and the academic year is planned as a whole. In this setup, the main goal of the Basic Design I studio is to discuss basic design principles through applications.

The Basic Design I studio is shaped by the basic design approach and way of thinking that has been going on since the Bauhaus school. The studio process was shaped by two-dimensional and three-dimensional studies and four practices aimed at developing abstract and conceptual thinking skills. In Basic Design I studio; The first two applications named *"point-line"*, *"color-texture"* and the last two applications named *"solid-volid"*, *"volume-form"* were constructed together. The first two applications are the experience of redesigning the concepts given through artists and art movements, extending from two dimensions to three dimensions. In the third application, using basic design principles such as rhythm, balance, contrast, and unity, a composition is designed in a defined volume, in which full-empty unity is considered. In the last application, the full-empty composition was shaped by considering volume relations and interactions. Each application was supported by seminars including conceptual expansions, reflections and examples from the disciplines of art and design, starting from the definition of the subject.

The Basic Design II studio is designed with problems that will open up the discussion of different concepts that will develop creative thinking on this knowledge. As in the Basic Design I studio, four applications were planned

and each application was supported by seminars in which the topics and concepts that were discussed. The first two applications are a continuation of each other, designed to represent the interaction and perception of the individual with the city through the concepts of city, urban experience, mapping, urban map, urban space, urban place.

In the first application, on-site experience trips were organized to Karaköy, Vefa and Kadıköy, and students were expected to represent these trips with mental maps. As Şenel stated, mapping refers to a dynamic and open-to-development representation between the mapped place or object and the mapper by redefining each other (Şenel 2019 and Şenel, 2014). For this reason, mapping gives an opportunity *"to develop a sensitivity and a critical view of the continuous formation of the place by human existence, experiences and design actions"* (Şenel, 2014). In the second application, it is aimed to develop an articulation application, that is, a kind of parasitic architecture or urban installation design proposal, for the urban spaces to be determined on the routes where the experience trip is organized. The practice of articulation in the urban space is the practice of settling in the existing space, which incorporates the concept of interaction and temporality of installation art with the space (Sözen, 2010), and the flexibility and adaptability of parasitic design (Yorgancıoğlu and Seyman Güray, 2018). The third application includes the discussion of Gestalt perception and concepts, which are at the center of the first semester's basic design studio, through the concepts of recycling, reuse, and sustainable design. According to the Gestalt theory, the whole has a different meaning from the sum of the parts and is perceived as a whole (Sarıoğlu Erdoğdu, 2016). The subject is a re-use design from electronic waste using Gestalt principles. The last application, the wearable kinetic prosthesis, discusses its application, movement, prosthesis, wearing actions and their interaction over the body. The definition of prosthesis in the medical literature is an item made and worn for the missing part of the body and its purpose is to correct a deficiency. In the basic design studio, the learners will develop a motion system design proposal that their body is missing and needs additionally.

The basic design II studio started with this setup, lasted for six weeks, the first application was completed, the second application seminar was given and the process was entered with the first discussions on the design idea. However, education was suspended as part of the COVID-19 pandemic quarantine measures. After a two-week obligatory break, the process was completed by switching to online training in the basic design studio (Figure 1).

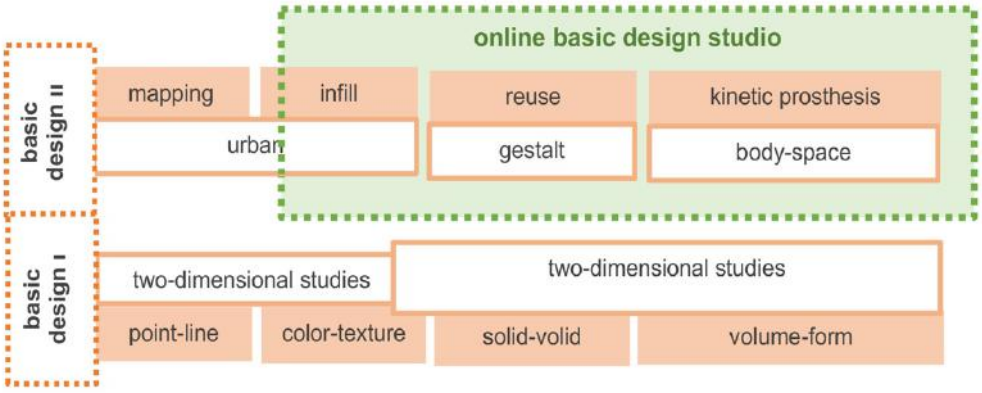

Figure 1: *Content Program of Basic Design I-II studios*

3. The Dialogical Structure of the Online Basic Design Studio

The transition process from face-to-face education to online education has been a new experience for both students and practitioners, which has taken place very quickly. In order to experience this sharp transition in flow, a structure proposal based on Bakhtin's dialogic view has been developed. In the transition, the three components of the basic design studio; studio content, studio space and studio process have changed. A structure has been constructed that defines dialogic relations for these three changing components.

Bakhtin's concept of dialogue is a concept that takes its etymological origins from dialogue but expresses more than a dialectical dialogue. The dialogue expressed here goes beyond just saying what one thinks (Yüceer, 2020). Dialogue is the flowing experience of communication and relationships on a multidimensional and complex web of concepts. Dialogical communication, on the other hand, is freedom in a flowing state without being subjected to the pressure of goals and individual attitudes (Yıldız, 2014). Fisher states that each dialogue creates a new cognitive structuring area in the possibility of shared thoughts (Fisher, 2007). Interactions in dialogue are continuous and there are oppositions, struggles and associations in these interactions. With this aspect, it assumes communication between plural meanings and plurality of subjects (Adıgüzel Özbek, 2020).

On the other hand, dialogic education takes place when different perspectives open up dialogue spaces for the joint construction of knowledge (Reznitskaya, 2012 and Alexander, 2008). For this reason, dialogic teaching requires dialogic interaction, but not every teaching that includes dialogue can be defined as dialogic (Yüceer, 2020). Alexander (2008) bases dialogical education on five principles that aim at teaching and learning togetherness. These principles are; collective, reciprocal, supportive, cumulative, purposeful. Collectiveness defines a common learning and inquiry space, that is, all participants, who teach and learn in the same environment. Reciprocity, participants exchange ideas and develop alternative perspectives. Supportiveness, providing an environment in which ideas are freely expressed, knowledge production develops by helping each other. Accumulation, everyone interprets them within the framework of coherent thought and understanding, based on the contribution of each other. Purposefullness, the teacher structures the communication by considering the educational goals (Alexander, 2008).

It shows that the dialogical education model is an approach that supports the processes of discussion, thinking and asking questions over concepts, which is the main goal of the basic design studio. In the transition to online education, the studio space and the studio process have defined an area that is almost completely independent of the teacher and learner and difficult to predict because it is not experienced. However, studio content and its adaptation to online education are still under the control of the teacher and learner. In this context, the studio content is handled as a collaborative dialogue relationship. Strategies have been developed to increase partnership with the studio space and process.

The face-to-face basic design studio structure was handled as a data within the framework of the principle of cumulativeness, and in this context, the main framework of the practices in face-to-face education was preserved and shaped with new concepts that entered our lives with the COVID-19 pandemic. In the studio process, which interactions can be included in the studio process, which is transferred to the virtual within the framework of the principle of supportiveness, and how the teaching-learning communication should be shaped in line with the principle of reciprocity, has brought up the questions. The principle of purposefulness of all these strategies; necessities, constraints and changes are structured around how they can be handled as a creative phenomenon and how they can support creative thinking. As a result, the configuration of Bakhtin's five principles that are collective, reciprocal, supportive, cumulative, and purposeful, define dialogic

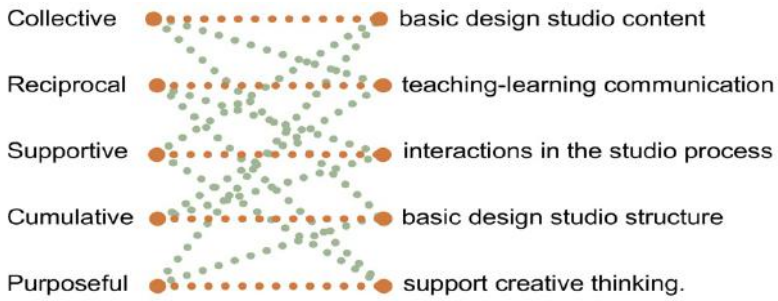

Figure 2: *Basic Design Studio with Dialogic Education Principles*

education in the basic design lesson was as in Figure 2.

3.1. Studio Content

The studio content has been shaped by establishing dialogic relations with the changes and new concepts that the COVID-19 pandemic has brought to our lives. The pandemic has added "life fits into home", "stay at home" discourses, the concept of social distance, and new products such as masks and disinfectants to our daily lives. The studio content has been transformed by these new contexts, and in this process, it has been shaped by establishing dialogic relations with the studio space and the studio process.

After the first application was completed in face-to-face education, the second application, articulation to urban space, became *"Interior Infill"* in the online studio content. The dialogic context of the application with COVID-19 is to move the home to the center of life with the discourses "life fits into home" and "stay at home". While the attachment function remains constant, the space to be infilled moved from the city to the home. Thus, it is aimed to establish dialogic relations by entering into a dialogue with the future house fictions that will be created by fitting the urban space into the houses. Designs have been developed by questioning our ways of articulating with COVID-19 on the discourses of "life fits into home" and "stay at home". The learners applied the home infill designs one-to-one with the materials they found at home; has represented these three-dimensional home installations in two dimensions on online platforms (Figure 3).

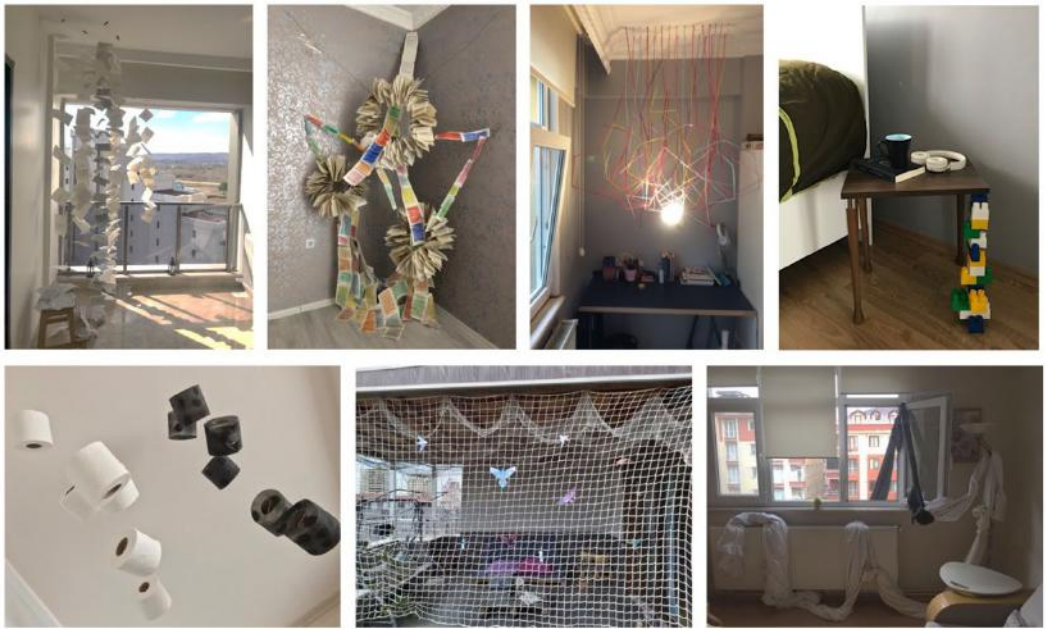

Figure 3: *Application of Infill to the Interior*

Thirdly, for the practice of refunctioning with Gestalt principles, the waste load created by the use of masks, disinfectants, and increased electronic equipment at home, which came into our lives with the COVID-19 pandemic, was evaluated. The learners shaped their reuse designs with the waste materials found at home. Re-use scenarios were produced by entering into dialogue with the new materials that came into our lives with the COVID-19 pandemic. Thus, solutions and design approaches have been developed for materials that will define a serious waste load for the environment in the future (Figure 4).

The fourth and final application, the wearable kinetic prosthesis, has been changed to the *"Wearable Social Distance Prosthesis".* The concept of social distance, which is one of the important concepts of public interior design in the field of interior architecture, has become the limit element of everyday language and life. The concept of personal space in interior design and use has left its place to social distance. In the basic design studio, a dialogue was created with this change of the concepts of personal space and social distance. While the limits of personal space and body are important in the wearable kinetic prosthesis, personal space has expanded to social distance with the wearable social distance prosthesis. On the other hand, the position of other bodies to our body, as well as the limits of our own body, has come into question. As in the other

Figure 4: *Application of Re-use Practice with Gestalt Principles*

three applications, it is planned to produce the designs on a one-to-one scale or close to this scale with the materials available at home and the possibilities offered by the materials (Figure 5).

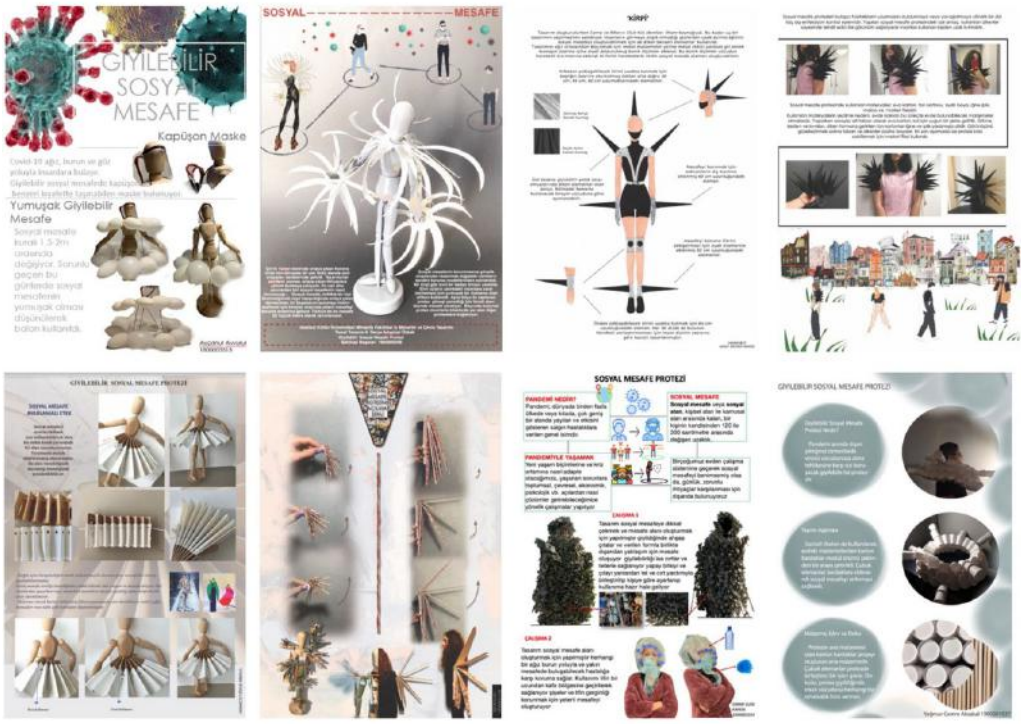

Figure 5: *Application of Wearable Social Distance Prosthesis*

applied in the house on a one-to-one scale. Thus, the online education space is not limited to virtual spaces, chat rooms and online platforms; and the home space is also included in the education. In the last application, the boundaries of their own bodies, the space defined by the body and the one-to-one experience of it were reshaped with the design idea.

3.2. Studio Space

The studio space, which is the other component of the basic design studio, has been moved from the physical space to the virtual space with online education. In this transition, software and digital platforms where synchronous lectures are made have defined the virtual studio space (Adobe Connect software and Cats platform specific to the Department of Interior Architecture and Environmental Design at A. University).

In the transition from physical space to virtual space, a dialogic relationship has been established and the concept of (un)limited space, where the boundaries are blurred, has been developed. In the first two applications of online education, the home space has been made a part of the studio space. In the first application, the house space and its potentials were evaluated and the design approach was

The dialogic studio space is neither physical nor virtual. It is at the point where the dialogue between the virtual and the physical is established, where the relations are produced. In other words, besides online environments, the home defines a (un)limited space by determining its own place at the point where the space or body blurs its boundaries and the design idea takes root.

3.3. Studio Process

The third component of the studio is the studio process. The studio process is a layered process that includes the teacher-learner interaction, the time experienced in the studio, the production processes and representations

carried to the studio and outside the studio. The fact that all relationships in online education are limited to digital platforms has led to the exclusion of different interactions, while it has raised the question of which interactions can be included in the virtual. In order to overcome this question, diversified interactions were adopted to define the dialogic relations between the face-to-face education and the online setup of the basic design studio. First of all, the process that progressed with the unity of all teachers and students in face-to-face education continued in the same way on online platforms. All directors and students participated in the studio online on virtual platforms. However, a process was started in which the student represented and the teacher only interpreted. Co-production of the teacher and the student was excluded from the process.

The fact that the applications were produced exactly at home, for the home, enabled the students to enter into a dialogic relationship with the home space, but the representation of the applications by photographing caused the three-dimensional expressions to progress through two-dimensional expressions. While this situation led the students to different representation methods such as gifs and video presentations, it pushed the teachers to an interaction where the students could be actively involved in the production process in the chat rooms at different times. International guests were able to be invited to the seminars and online platforms where the speakers could attend only in accordance with the transportation and time constraints in face-to-face education. Thus, the diversified communication tactic open to the participation of international guests, in which the teacher and learner developed their own communication strategies, provided the opportunity to establish dialogic relations.

4. Conclusion

Due to the compelling reasons of the COVID-19 pandemic, the majority of the basic design studio process, which started in face-to-face education in the 2019-20 academic year, was continued and completed online. This transition has been very challenging given the goals and scope of the basic design studio. A studio structure based on Bakhtin's concept of dialog has been developed in order to experience this sudden and definite transition in flow and to evaluate the process itself as a creative phenomenon. In the study, the dialogic structure of the online basic design studio is presented as an approach proposal for online education, which is still ongoing and is expected to continue.

The studio's structure was designed by considering the changing studio content, studio space and studio process in the transition to online education, in line with the dialogic education principles. The studio content, which is still under the control of the teacher and the learner, has been determined as the common dialogic point and the content has been expanded to include new concepts that have entered our lives with the pandemic and new materials added to our daily routine. In the transition from physical space to virtual space, the concept of limited (limited / unlimited) space supported by the dialogic structure of the studio content that includes the home space in the process has been developed. The social interaction nature of the studio process was limited to the communication interfaces of virtual platforms. In order to overcome this situation, the concept of dialogic and diversified communications, which are the basis of dialogic education, have been adopted. This mentality of the structure is shaped as in Figure 6.

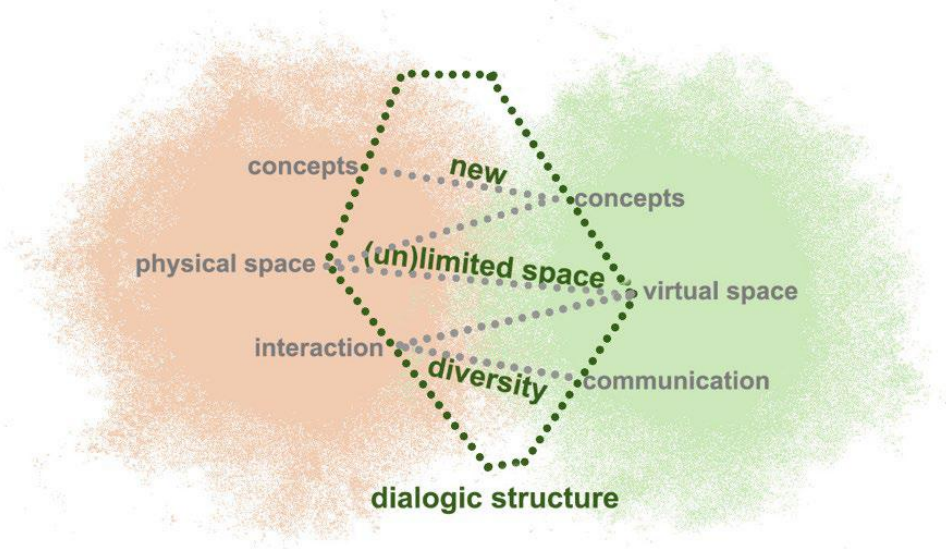

Figure 6: *Dialogical Basic Design Studio Structure at Online Education*

The inclusion of current concepts in the studio content enabled students to look at the pandemic and its contribution to our lives from a different perspective, while supporting their creativity and increasing their excitement about the subject. In addition, the fact that the house became a part of the studio space enabled them to look at their homes from a different perspective with the familiarity they experience every day. This allowed them to question their home and the idea of home. At the same time, the additions made to the house paved the way for the participation of the household in the process and created dialogic relations between the households. Thus, compulsory imprisonment at home has evolved into a dialogic structure that opens door to different experiences and in which daily experiences and places are questioned.

Questioning the contributions of the dialogic structure setup to abstract and creative thinking skills in terms of learners in the basic design studio will pave the way for the development of dialogic structure through multi-dimensional discussion. On the other hand, it has been seen in the process that flexible planning of the structure is required, considering that each learner's response to necessities and difficulties differs and learning orientation is different. The compulsory online education process still continues. Undoubtedly, the most difficult courses in online education are design studios. It is thought that the dialogic structure approach, which is put forward specifically for the online basic design studio, may also provide data for other design studios and it is recommended to be developed with dialogic studio structures to be created specifically for other design studios in future studies.

In addition to the COVID-19 pandemic, the courses and studios included in the design education plans are expected to keep up with this digital transformation in a world that is digitalizing and changing day by day. In this context, the dialogic online basic design studio structure is presented as an approach proposal for these changes and digitalizations. Ultimately, this approach allowed the online basic design studio, which started out of necessity, for learners to think critically and to explore and overcome their own limits.

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