

A Study on the Role of Narratives in Product Form Visualization

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by

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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources, which have thus not been properly cited, or from whom proper permission has not been taken when needed.

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Abstract

Abstract

Designers' intuitive responses are often derived from their own experience, but there has been little research that studies the use of narratives rooted in designers' lived experiences. The aim of this academic research is to investigate whether the use of narratives could help designers to work more effectively when generating product form. The focus is on the preliminary phase of the design process when designers generate the initial product form.

The research examines how practitioners reflect on their actions during and following their work. The approach to understand how designers generate product form considers evidence that comes from observation, experiment, analysis, and reflection. I have drawn upon research literature and the work of contemporary and famous designers to consider the role of narratives in the design process.

The research consisted of two main phases: fieldwork, which established that designers do make use of narrative in their practice, and workshops to demonstrate how the use of narratives support form generation during the design process.

The workshops and the subsequent evaluation proved that narratives helped the participants in planning and navigating the design process. According to the research results, the use of narratives helps designers to work more effectively on generating product form during the preliminary phase of the design process. In this act of exploration, there is a discovery of the self that elucidates meaning for the designer, instills a sense of ownership, brings focus, improves choice making, and builds new confidence.

By building on this narrative schema, designers have discovered that design is not set apart from daily life but springs forth from the visual impressions of their experiences. Based on these findings, this thesis proposes a three-step narrative method of “share,” “recollect,” and “visualize.” This method encourages designers to first share – i.e. narrate – a personal experience, then recollect the emotions the given experience evokes

in them and, finally, visualize the experience in the form of sketches. Sketches and drawings help designers organize thoughts and dig deeper.

As a result of the three-step narrative framework, the design process, which often starts with ambiguity and anxiety on the designers' part, can lead to wonderfully unique solutions. Product form visualized with the help of personal narratives is aesthetically more appealing – stronger, more dynamic, varied and surprising – than designs that come out of a functional brief without any personal narrative. The narrative seems to be the condition that guarantees the unity of the object and, at the same time, gives the object its structure by connecting and merging lines, colors, and shapes of the experience into a new form.

The research uncovered several aspects of narratives that call for further clarification and study. An interesting issue mentioned by several participants in different phases of the research focuses on whether other people – including the future users of the objects – can really relate to products born from the highly personal experiences and memories of designers. Another important question is how the three-step narrative framework could be integrated with different constraints and considerations of the design process, for example materials, manufacturing, sustainability, and engineering.

Although some details of the real-life use of the method will need to be investigated and clarified in the future, it is evident that the method has clear implications for design education. Teaching design students to use narratives as part of their concept generation, particularly in the early stages of design when concepts are ambiguous, can lead to new interpretations, novel products, and a more personal connection with the work process.

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Chapter 1 Introduction

1.1 Product Form and Narrative

“Form is the shape of the content”
(Ben Sahn)

Designing the product form is an act of designing a physical object. “The ultimate object of design is form” (Alexander, 1973, p. 15). Designed objects come into existence through the form. The unique know-how of designers, the core of their ability, is to provide, in a ‘designerly’ way, an aesthetically pleasing form. “The formative criterion really seems to be the special ingredient that makes design ‘real’ design” (Schneller, 2018, p. 39). Many research studies have focused on the design process, especially on idea generation. My research focuses on the preliminary phase of the design process when designers generate the tentative product form. In the design process, ‘ideation’ is a highly generative phase, during which form generation happens.

How do designers start sketching their first ideas? Where do these ideas come from? In creating a product form, “you never come to a ‘final,’ ‘complete’ or ‘fully correct’ solution – since you have no objective criteria for such. The problem is continually evolving and mutating” (Ritchy, 2013, p. 4). Designers know that they need to find and give appropriate shape to possibilities. In this early phase of the design process, designers commonly seek external stimuli and “may follow recollections of existing buildings or artifacts which may serve as references; they may find their origins in precedents derived from metaphors, analogous cases or entities belonging to a similar type” (Goldschmidt, 1991, p. 30), with the

aim of framing and solving the problems they are engaged with. Designers interpret what they see (and otherwise sense) in ways that lead to design outcomes. To visualize product form, designers make sketches entirely for their own understanding and not to present information to others. The act of visualizing product form is the part of the design process many designers fail to narrate. This reflective process, which is a crucial aspect of the design process, has not been researched extensively.

For many years, I have been thinking about the importance of narrative when trying to make sense of design outcomes. Teaching young design students, I have been intrigued by how much effort was directed not simply to problem solving but to discovering and framing what problems should be solved. I began to notice that the ideation phase often relied on narratives. Designers were especially likely to narrate their experience when trying to sort out the difficult relationship between form and function. In this way, designers' experience turns into a narrative which, in turn, transforms into product form. The narrative can help to make the meaning of the form clear. These narratives justified why a particular outcome was the most appropriate form to the function. When design students narrate a personal experience that led to the solution, they are told that design is not art, as the designer always has to think of the end user. Therefore, personal experiences are often dismissed. The narrative about the self and the subjective interpretations are devalued-when considering how the object will function and interact with the world.

My research proves that narratives about the self and personal experiences can not only justify the product form but also provide a way of visualizing it. Design involves feelings, and narration helps to instill meaning and emotion in design. Metaphors, analogies, and narratives are powerful tools that help to bring concepts to life. Designers create objects not only as a set of logical propositions, but often as a pattern of experiences. Designers link unconnected elements to create new designs. Visual experiences are based on the features of the visible world. These experiences are stored in the unconscious and are manifested through the ideas they generate. Lived experiences that come about through direct perception are a critical factor in the generation of design ideas. The memory of such experiences is made up of a pattern of ideas, thoughts, and images, and by visualizing them, the designer promotes the creation of new connections that didn't exist before, ones that

form the basis for new ideas, and they do this by deliberately blurring the lines between fact and fiction.

Designers create new patterns and new relationships that once may have seemed obtuse, unrelated or even inappropriate. Narratives provide a way in which designers can explain what they do in an easily understandable, informal way. Our objects signal who we are – the impulse to measure human experience through the things we can touch, see and hold comes naturally. From an early age, children register and coordinate their surroundings and sensory perceptions to interpret and explain what puzzles them and governs their lives. This stored knowledge grows with time and accompanies a person throughout life. Designers can draw themselves into their own experience of spaces, people and things. Clues exist in their memory (Sethi, 2015).

I claim that the use of narrative is appropriate for visualizing product form as it brings out a meaningful whole, a form that is coherent and complete, and it makes the essence of the form comprehensible. This research aims to investigate whether the use of narratives could help designers to work more effectively on generating product form. The research aims to confirm the importance of the concept or idea generation stage in the design process and to explore if the use of narrative improves visualization of product form.

1.2 Visualizing Product Form

“A designer achieves being and identity by virtue of his creative activity, his will to form”.
Herbert Read

Form is the visible content of the product. The ultimate aim of industrial design is to determine the formal properties¹ of objects (Maldonado, 1965). The creation of form and aesthetic experience is a principal task of design. Designing a novel product is founded essentially on the culture of technology and business. However, the formal qualities of the product are expressions coming from the designer. Visualizing form is a way of embedding emotions and subjective elements. Business demands a form that is original, genuine, surprising and beautiful. “The designer has the capacity for envisaging a non-present reality,

¹ For Maldonado formal properties were not just external features, but they were also relations which convert an object into a coherent unity of both the producer and the user.

analyzing it and modelling it externally” (Archer, 1992). Design has its own distinct “things to know, ways of knowing them, and ways of finding out about them” (Cross, 1982, p. 22). A ‘designer’s’ (artist’s) most important method of working through the problems of existence is by means of the images he invents, judges, and manipulates. A work of ‘design’(i.e. visual art) is not an illustration of the thought of its maker, but rather the final manifestation of that thinking itself (Arnheim, 1965).

The inherently creative process of form visualization seems to result from visual reasoning, induced by sketching (Goldschmidt, 1991), for the sketch can concretize design ideas (Suwa, 1997). Schon (1992) also pointed out that drawing a sketch is a reflective conversation with the situation. “Drawing is not about representation but about thinking. Trying to understand what you are looking at... the brain sends a signal to the hand, and the hand sends one back, and there is an endless conversation between them” (Caplan R. , 2005). The main concern of the designer at this stage is the conception and realization of a new product form.

Visualizing product form is a very personal process through which designers search for and develop new concepts that serve to clarify and extend their ideas. True creativity lies in the ideation phase. “Form is necessary and vital to the expression of ideas. Without it, content is barren” (deHarak, 1997, p. 27). Design has always been engaged in the creation of a material representation of speculative future worlds. “Instead of talking about grand, overarching things like futurism in the 1960s, we need a new consciousness that suits the tenor of our own period” (Stirling, 2012). As Andrea Branzi states “we can only work on the micro situations”. Design is more than just the manipulation of material and processes to solve practical problems. Design also involves the idea of making design products aesthetically desirable (Buchanan, 1995).

In the act of ideation of product form, one is guided by loosely connected ideas. “Designers can, and do, on occasion, seize upon chance information, adopt capricious ideas and exercise untidy methods in the course of a project” (Archer, 1992, p. 9). A designer’s experience, thoughts, and emotions are all manifested in the designed object. Lived experiences resulting from direct perception appear to be a critical factor in the generation of design ideas (Sethi, 2015). These experiences are, by definition, stored in the unconscious and become manifested through the ideas they generate. Visual, non-verbal thinking is

fundamental to how designers work (Cross, *Designersly Ways of Knowing*, 1982) and much of the knowledge involved is experience-based, tacit and embedded within the act of designing (Schon, 1983). Designers have a dialogue with their drawings while thinking about the product form and its structure. By understanding and expressing these internal ideas, designers are able to develop a concrete product form. “Elements of inventiveness, spontaneity, even randomness, confer ‘life’ upon design, the touch of humanness, without whose expression perfection is quite often dead” (Nadin, 1990).

Narratives provide a way to connect what designers make and how they make it. Narratives give form to design concepts. Like narratives, concepts of product form are not neutral; they are always situated in specific contexts. Narratives bring the inert material, processes and product form to life. “Storytelling, after all, does nothing, except shuffle words, and yet through the words’ arrangement, new worlds are built filled with an imaginative wealth” (Narayan, 1989, p. 224). Designers also shuffle planes, volumes, colors and textures, and through the arrangement of these elements, they create new concepts. Emotion and meaning emerge from harmonizing the elements that make up the narrative. It is the narrative and not the object alone through which we construct meaning.

Designers narrate to make their point. A great example of this is the 'Juicy Salif' lemon squeezer, designed by Philippe Starck in France, and manufactured by Alessi in Crusinallo, Italy in the 1990s. According to Starck’s account, the design for the lemon squeezer came about when “once in a restaurant, this vision of a squid-like lemon came upon me, so I started sketching it” (Carmel-Arthur, 1999). Peter Lloyd and Dirk Snelders researched into Starck’s life and tried to understand why a ‘squid-like lemon’ was significant to him. He spent his early childhood sleeping under the drawing board of his father, who was an aircraft designer. Starck often peeked into his father’s work and dreamt of flying away in his little plane. He grew up loving science fiction cartoons. His sketch (Figure 1-1) on the table mat shows how the squid began to evolve. (Lloyd, 2003)

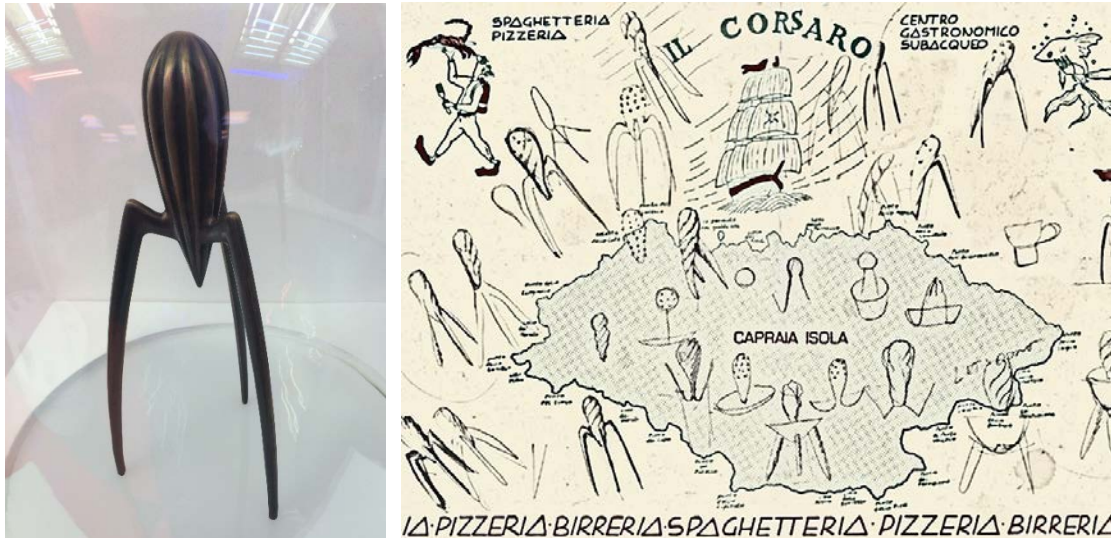


Figure 1-1. Juicy Salif by Starck. “His sketches abstractly remind him of the old comics he used to read... things begin to gel in his mind, and from the dragging creature emerges a lighter, three-legged form. Like one of the spaceships he used to think about jetting up to space in, he likes the form... next morning he phones Alessi and tells them the design for the lemon squeezer is ready.” (Cross, 2016, p. 18)

The narrative seems to be the element that guarantees the unity of the object, and at the same time gives the object its structure by connecting and merging lines, colors, shapes, and volumes into a new form. “Lloyd and Snelders suggested Starck, in developing the concept, was doing what many designers do, which is to draw upon a repertoire of precedents, of remembered images and recollections of other objects that helped him to give a more coherent, practicable and attractive form to the concept” (Cross, 2016, p. 19). According to Annina Schneller, “a designer must create well-defined appearances and aesthetic experiences by virtue of mastering the principles of form in all its details. If they do not, then they will not be called designers. If they do particularly well, they can become great designers” (Schneller, 2018, p. 47).

1.3 Research Methods

Everyday life is a central issue in design. Everyday experience lie at the very basis of design activity itself, and the ways in which we design may be most important clues to how we make sense of the world. Design “is a systematization of our experience of the physical world” (Daley, 1984). “The act of sketching or building prototypes is not purely making

process; the creative action serves to assist the designer in better understanding – specifically, understanding through experiencing” (Wendt, 2018, p. 109). Anne Caplan states that “making itself is research that directly enriches the methods of design practice. Since Design articulates itself through design activities, it seems natural to focus on the practical design activity or the capability to design in order to gather a scientific perception of the discipline” (Caplan A. , 2018, p. 352).

Qualitative inquiry is well suited to an investigation of design. The narrative of a product form becomes an object of study itself, by focusing on the meaning and sense-making. Sense-making involves the implicit and explicit mental processes of scanning, interpreting, responding, and is linked to decision making. There are ‘designerly ways’ of knowing, of discovering something new, product forms are conceived in an emergent process of interpretation and reconstruction of their external world, and the role of theory in design remains mostly implicit.

As objectivity is a key characteristic of positivism, to support the goal of the research and to be able to rely on subjective elements, social constructivism was the selected approach (see Table 1-1). Social constructivists assume that individuals seek to understand the world in which they live and work. Researchers recognize that their own backgrounds shape their interpretation, and they position themselves in the research in a way to acknowledge how their interpretations flow from their personal and historical experiences. Individuals develop subjective meanings of their experience – meanings directed towards certain objects or things. The goal of constructivist research is to rely as much as possible on the participants’ view of the situation being studied. Rather than starting with a theory, inquirers generate or inductively develop a theory or pattern of meaning (Creswell, 2009).

Table 1-1

Contrasting implications of positivism and social constructionism (Easterby-Smith et al., 2002)

	Positivism	Social Constructionism
The observer	Must be independent	Is part of what is being observed
Human Interest	Should be irrelevant	Are the main drivers of the science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress through	Hypotheses and deduction	Gathering rich data from which ideas are induced
Concepts	Need to be operationalized so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to the simplest terms	Should incorporate stakeholder perspectives
Generalization through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reasons

This research aims to develop new knowledge of the role designers' personal experiences play in visualizing product form, and use it to develop a framework to support designers interested in the use of narrative in the design process. The research is focused on the preliminary phase of the design process when designers generate the tentative product form.

The background study began with understanding the meaning of product form. The research then proceeded through the following two phases: fieldwork, which established that designers do make use of narratives in their practice, and workshops, which demonstrated how the use of narratives support form generation during the design process. The following objectives guided the research:

Background Study: To review and understand the landscape of product form, and to investigate the simultaneous presence of a variety of forms of the simple vessel, a pot.

Q1: What is the meaning of product form?

Fieldwork: To review and understand the landscape of how designers visualize products.

Q2: What means do designers use to visualize unique and original product form?

Q3: What role do emotions and subjective experiences play in this process?

Q4: Do designers use personal experience, images, and narratives when visualizing product form?

Workshops: Six workshops were conducted in China, India, and Singapore in design schools and an in-house design studio of an appliance manufacturing company. The objective was to develop a framework to visualize product form using narratives and to test its usefulness as part of the design conceptualization process.

Q5: How a framework/process be developed to help designers to embed narratives in the act of visualization of product form?

Q6: How useful is this framework and why?

Figure 1-2 shows how the research questions were grouped during each phase of the research.

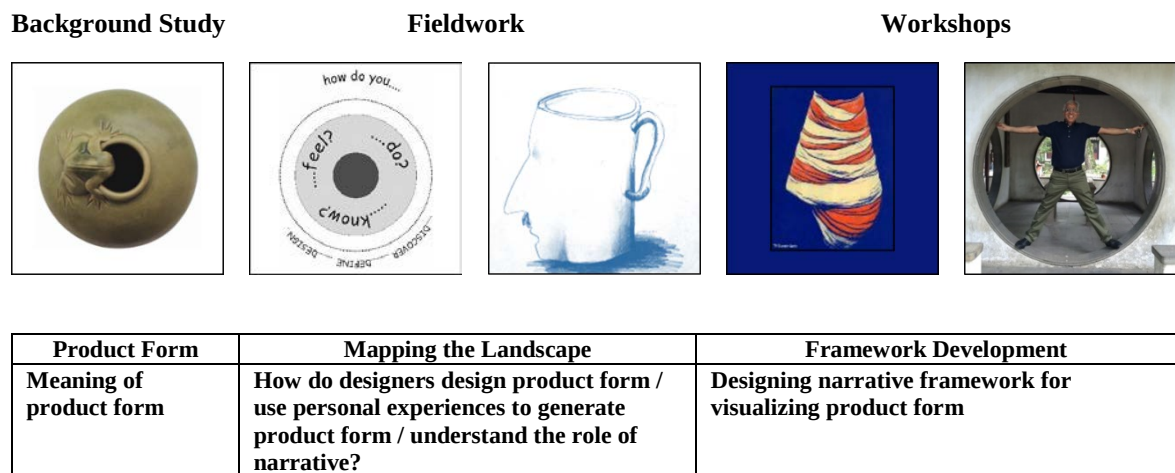


Figure 1-2. Objectives of the research

The connection between the research phases, the objectives, and the five empirical studies conducted is shown in Table 1-2.

Table 1- 2

Connection between the research phases, objectives and outcome

Research Phase	Objective	Study	Data Collection Method	Outcome	Chapter
Background Study	Understanding the landscape	Study 1	Publication and qualitative survey	Product form was connected to personal ways of how designers visualize it.	2
Fieldwork	Mapping the landscape	Study 2 Study 3	Interviews and visiting design studios and design exhibitions Questionnaire and survey	Nine design narratives were identified. It was established that the use of narratives was one of the ways to visualize product form. Eight narratives of product form were collected – narratives are a way of embedding emotions and subjective qualities in product appearance/form.	3
Workshops	Framework development	Study 4	Mixed methods	Six workshops with design students and design professionals were organized to generate product form using narratives.	4
Evaluation & Analysis	Aesthetic Assessment	Study 5	Mixed methods	A workshop with students was organized to generate stimuli with and without narratives. The outcomes were assessed with a group of students.	5

1.4 Significance of the Study

The aspect of using narrative to visualize product form is a novel approach. In design research there are few studies that tackle the perspectives of designers' experiences to visualize product form. Understanding personal ways of visualizing product form usually does not form part of design research, as modern concepts of design ignore subjectivity and attempt to neutralize the individual perspective of designers.

The thesis proposes a three-step narrative process of how the use of narrative – a sequence of events and expressions – forges links when visualizing product form. When designers narrate they lay out how they as individuals experience specific events and confer their subjective meaning onto these experiences and the emotional essence of the experience unifies the product form. This three-step narrative framework was tested and implemented

by students in China, India and Singapore and by practicing designers in China and India with positive results. This approach is new, as it gives voice to the designer's viewpoint by incorporating subjective experience into visualizing product form.

1.5 Organization of Thesis

The outline of the upcoming chapters of this thesis is as follows. Chapter Two presents the background of this research and draws upon the research literature in the broader context of relations between narratives and product form in design. We begin with a study of the form traditions of Asia, focusing on everyday pots used in Asian countries. The lasting qualities of functional, yet eloquent, forms come from the deep connection between the creators' everyday lives and the nature of their visual surroundings. Subsequently, the chapter provides essential commentary about the relevance of narrative in visualizing product form as well as reflection on how form follows fiction, by exploring the ways famous contemporary designers visualize product form from their life experiences.

Chapter Three puts forward the fieldwork, concentrating on collecting, analyzing and cataloging design findings, narratives, and the survey of work that shows how designers create product concepts by using their personal experiences. Our fieldwork attempted to capture design narratives through techniques such as observation, surveys, and informal interviews. The process was explored by collecting narratives from practicing designers. Eighty-one practicing designers' narratives were analyzed – these were works of famous, contemporary and young designers from different parts of the world and were selected by having designed at least one object for the everyday living environment. They were designers who had been developing products for a minimum of five years, and at least one of the products they designed was on the market. The designers were either part of a large corporate design studio or had their own professional practice. The act of collecting data also became the framework for implementing narratives into product design to enable concept/form visualization both in practice and education.

Chapter Four, summarizes the results and discussion of seven workshops carried out with industrial design students and practitioners to test the practical feasibility of the three-step narrative process. The workshops explored the narrative process of practicing designers and students in design schools in India, China, and Singapore. As workshops are a standard

method through which designers are trained and undertake collaborative work, this method was employed throughout the research. The final workshop was attended by 18 undergraduate National Design Institute students who participated in it as part of their product design course. The impact of the framework on the design of product form was explored.

The final workshop was performed in a design studio, under the supervision of faculty and experts from the industry. Students were assessed on oral presentation, design sketches, and written reports. Design sketches for the project were collected and peer-assessed based on design skills, presentation performance, traditional design results, and written report grades. The method for collecting data on class work and the presentations was observation and the completion of rubrics.

Chapter Five presents the aesthetic assessment and evaluation of the designed product forms (the artifacts were selected from the fieldwork and workshops). The focus was on whether the use of narrative improved the expressive qualities and the unity of the designed artifacts. During the final workshop a group of design students worked on designing a set of refrigerators with and without the narrative process. Afterwards, the students filled out a questionnaire to assess the usefulness of the three-step narrative process and the aesthetic dimensions of the visualized product form.

The project was also evaluated by design experts in academia and the target users. They had the chance to express their views on the benefits, limitations and possible new directions for the use of narratives. The research confirmed that the three-step narrative process was useful. The participants found that the product form visualized through the use of personal narrative was aesthetically more appealing than designs without personal narrative. The narrative seems to be the condition that guarantees the unity of the object and at the same time gives the object its structure by connecting and merging lines, colors, shapes, and volumes into a new form. Finally, we discuss the relevance of the three step-process in visualizing product form. Lastly, in Chapter six, the claims and the contribution to the field of this research are presented, as well as the potential areas for future research.

Chapter 2 Literature Review

2.1 The act of creation: exploring the essence of form and ideation

“Form in art is shape imparted to an artifact by human intention and action” (Read, 1965, p. 30). In English, “form” seems to have an aesthetic connotation not carried by the word “shape”. Designed objects assert their existence through their form. Designers’ central concern is to determine the *formal* properties of the objects produced by the industry. “The physical form or design of a product is an unquestioned determinant of its marketplace success” (Bloch, 1995, p. 16). By visualizing form, designers manage to manifest the physical appearance of the product.

Product form represents, or is, a carrier of “aesthetic function.” The aim of this function is the evocation of aesthetic pleasure in the product form. It is important to note that there is a relationship between the aesthetics of “product form” and the other functions of the product only when the aesthetic function is connected with other functions, and it forms a part of the total structure (Mukarovsky, 1970).

Designers create product form for attention and differentiation. The concept of product form is important when considering how designers and users relate to products. How do designers start the design process, given that they want to come up with a yet non-existent product form? At the outset of many projects, designers are not even aware of what they should know or what they are looking for. Many research studies conducted have focused on the early stages of the design process, especially on idea generation. The ideation phase in

design is not necessarily seen as a case of problem-solving, “but as a starting point for a journey of exploration; the designer sets off to explore, to discover something new” (Cross, 2016, p. 8).

“The Greek word *idea* in its original sense, as used by Pindar, Aristophanes and in the gospel of St. Matthew, represents the visual abstraction of a distant object, when we see the whole without distinguishing its part” (Coleridge, 1853, p. 213). The ideation stage is a highly generative phase, as this is the stage where the form generation happens (see *Figure 2-1*).

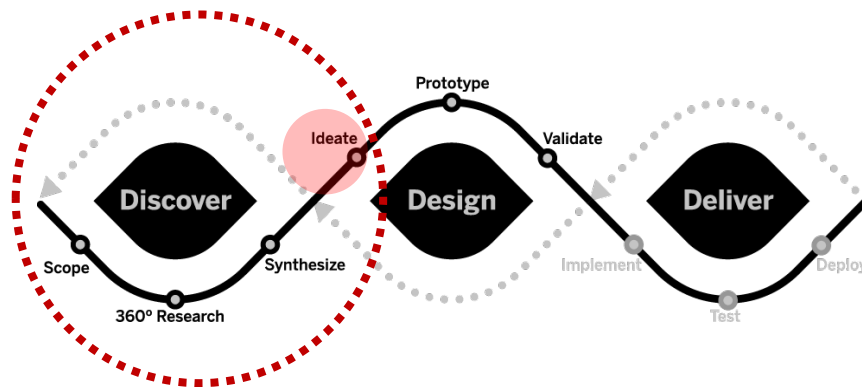


Figure 2-1. Ideation phase in the design process.

2.2 The visualization and the meaning of the product form

Since 1970, scholars studying design activities have presented various models of the design process (Jones, 1970, 1981) (Archer, 1979) (Pahl, 1984) (March, 1984) (Goel, 1995). These models all mention an important design stage: the visual representation of the design idea. The main feature of this stage is the use of drawing and sketches (Purcell & Gero, 1998), for these can concretize design ideas (Suwa & Tversky, 1997). Designers sketch to assemble, arrange, and configure elements of form, as well as to make sense of the product in its context and environment. “The sketches done for the eyes and directed by them make some of the design plans visible. They not only supply the designer with tangible images of

what his or her mind is trying out in the dimness of its own freedom” (Arnheim, 1995, p. 74).

Much of the ability to visualize product form is attributed to intuition and personal experiences. The designer “starts by generating partial images of tentative aspects of the designed entity. Such images may follow recollections of existing buildings or artifacts which serve as references; they may find their origins in precedents derived from metaphors, analogous cases, or entities belonging to a similar type” (Goldschmidt, 1991, p. 130).

When creating a product form, the designer attempts to make sense of the ambiguous. Product form emerges from the designer’s efforts to create order. Product form is a way of communicating the intention and the meaning of the object, therefore it is a crucial step in the development of appropriate product solutions. “What most designers do is to draw and re-draw lines, shapes, objects, and ‘fuzzy stuff,’ until they can ‘read’ in, or off what had been drawn, something useful” (Goldschmidt, 1991, p. 131). Designers extract cues from the context to help them decide on what is relevant and acceptable.

The principles underlying the way designers visualize product concept are not well documented. There are two possible reasons why little research has been carried out on how designers embody meaning: one is that designers are reluctant to make their knowledge explicit and the other is that they perceive form generation as an intuitive activity that is difficult to verbalize ((Crilly, Moultrie, & Clarkson, 2009)

2.3 From utilitarian to personal: designing a pot – an example of the complexity of form

A simple pot or vessel is among the earliest objects deliberately shaped by man. A pot or vessel appears to us through a form. In his famous poem, the Chinese philosopher, Lao Tse put it the following way:

“Clay forms pots,
But the void within creates the essence of the pot. [...]
Fundamentally:

The material contains utility,
The immaterial contains essence.”

According to Herbert Read, “the first vessels were round, semispherical bowls, but the nature of material inspired variations from the beginning... At some point in the process of formal evolution, the form responded, not only to utilitarian purposes but also to spiritual needs” (Read, 1966, pp. 40-41). As the simple pot can be shaped or molded to any imagined form, the strength, the richness, and the order of its visual form has evolved from the nature of the visual surroundings of the creator.

In their *The India Report*, Charles and Ray Eames (1958) stated that “Of all the objects we have seen and admired during our visit to India, the lota, that simple vessel of everyday use, stands out as perhaps the greatest, the most beautiful... But how would one go about designing a lota? First, one would have to shut out all preconceived ideas on the subject and begin to consider factor after factor:

The optimum amount of liquid to be fetched, carried, poured and stored in prescribed set of circumstances.

The size and strength and gender of hands (if hands) that would manipulate it.

The way it is to be transported – head, hip, hand, basket or cart.

The balance, the center of gravity, when empty, when full, its balance when rotated for pouring.

Its sculpture as it fits the palm of the hand, the curve of the hip.

Its sculpture as compliment to the rhythmic motion of walking or a static post at the well.

The relation of opening to volume in terms of storage uses and objects other than liquid.

The size of the opening and inner contour in terms of cleaning.

The texture inside and out in terms of cleaning and feeling.

Heat transfer – can it be grasped if the liquid is hot?

How pleasant does it feel, eyes closed, eyes open?

How pleasant does it sound, when it strikes another vessel, is set down on ground or stone, empty or full – or being poured into?

How will it look as the sun reflects off its surface?

How does it feel to possess it, to sell it, to give it?”

Of course, no one man could have possibly designed the lota. The number of combinations of factors to be considered gets to be astronomical – no one man designed the lota but many men over many generations. Many individuals represented in their own way through something they may have added or may have removed or through some quality of which they were particularly aware” (Eames & Eames, 2004, pp. 4-5).

Artisans create abstract forms as an elegant summation to their imagination; the forms they create take on qualities of meaning and have a definite personality. These beautiful forms all tell stories, enriching and enhancing the users’ everyday lives “The lasting quality of these forms comes from their deep connection with everyday rituals and ceremonies. They stop being utilitarian objects, but become symbols, vehicles for messages and meanings, auspicious and indispensable in their original form” (Trivedi, 2009, p. 6).

Christopher Alexander has emphasized how the ‘unselfconscious’ processes of craft design led to extremely subtle, beautiful and appropriate objects. A very simple process can actually generate very complex products. This transition to a beautiful but still utilitarian form, when function and aesthetics of forms meet and mingle is when forms first acquire their freedom and their expressive function. “Visual arts were the very torchbearers of the culture’s organic development and patterns of continuity, allowing its images to give form to the felt quality of experiences from everyday life” (Poovaiah & Sen, 2003, p. 2).

In India, as in many other places worldwide, the concern with ‘form’ is imbued with the consciousness of the totality. Art is never dissociated from other aspects of life and aesthetics emerged from a shared worldview with the acceptance of the diversity of form. The form has been an expression at the micro and macro level, the experience of balance, proportion, harmony and concord. (Vatsysyan, 1983).

“In the Indian context, the inner meaning behind an outer form is most important” (Balaram, 1995, p. 127). Form, though it can be analyzed in intellectual terms, is really intuitive in origin, and “only intuitive perception is capable of organizing and unifying the multiplicity of forces that make up the whole. If we try to explicitly identify – geometrically or

arithmetically – all its parts and relations we are, at best, left with a collection of pieces” (Arnheim, 1966, p. 228).

To achieve the power of the novel form, designers have to perceive the product form as a complete and comprehensive whole. This constant necessity to create a totality from perceived bits is an expression of our need to make connections to and understand our relationship with everything around us. The basic characteristics of any artistic expression is the ordering of a visual impression in a coherent, complete, living form (Kepes, 1965). Form thus emerges from designers’ experience and relationships, and as such, “will be, in the degree of spontaneity, an intimate union of the features of the present existence with the values that past experiences have incorporated in personality” (Dewey, 2005, p. 74). In this sense, product personality is the essence of product form.

2.4 The personality of form

The creation of concept and form is seen as an attempt to extend the self in new ways and to customize (personalize) the object. When one embeds personal experiences and narratives in the form of an object, such an object is regarded as part of the self. Sartre suggested that creators retain their identity in their products for as long as the products retain some association with the person who brought them into existence (Belk, 1988). Designers often create form as a vehicle of self-expression. Designers “seek, express, confirm, and ascertain a sense of being through what they create. The idea that we make things a part of ourselves by creating or altering them appears to be a universal belief” (Belk, 1988, pp. 145-46).

A historical vessel (*Figure 2-2*) at the Shanghai Museum exemplifies how objects can be employed to present ourselves to others – either as an extension of ourselves or as a vehicle of maintaining identities. The value of Zhong Jiang’s Pan is not only due to its physical form, but also to the narrative inscribed into it and the message it conveys: the inscription records that the head of the state made the bronze vessel for his wife, Zi Zhong Jiang, and hoped that his descendants would remember to use this vessel forever.

As one looks at the pan and reads the accompanying narrative, one connects with the husband’s feelings and affection for his wife as well as the personal dimensions of his reason to create the pan. The narrative and the pan become one – it is impossible to draw a line

between the two. Zhong Jiang's Pan materialized as a subjective version of reality, unifying feelings and desires, and communicating the husband's emotions to other members of his family through the form of the pan.



Figure 2-2. Zhong Jiang's Pan. This 7th century BC bronze ceremonial pan was made for Princess Zi Zhong Jiang. The intricate design of the vessel, unique to the bronze utensils of the time, makes this piece of work a real masterpiece. The three-dimensional birds, fish and frogs in the pan can turn 360 degrees.

2.5 Product form: from function to fiction – the emergence of narratives

In Louis Sullivan's famous axiom "form follows function," function is seen as the abstract principle inspiring different ways of giving form to artifacts (Arnheim, 1978). The axiom, which became the touchstone for many designers and architects throughout the world, meant that the purpose of a building or an object should be the starting point for its design. When architect Walter Gropius founded the German art school, Bauhaus, it was in some way a reaction against the expressionist movement of the time. Bauhaus embraced Sullivan's axiom, which promoted the idea of making design a relevant act for everyday living for ordinary users (Poovaiah & Sen, 1999, p. 3). The products designed during the Bauhaus era

were seen as simple, rational and functional objects. The focus was on merging design with industry, providing well-designed products for the many.

The Bauhaus emphasized form as an expression of function in design. Formal aesthetics were the means of creating highly functional and visually appealing products. In his 1926 book entitled *Bauhaus Dessau: Principles of Bauhaus Production*, Gropius wrote that an object is defined by its nature. In order to design an object – a vessel, a chair, a house – that functions properly, one must first study its nature, for it is expected to serve its purpose perfectly: “it must fulfill its function in a practical way, be durable, inexpensive and ‘beautiful’... the Bauhaus wants to train and educate a new type of worker for industry and the crafts who has an equal command of both technology and form” (Gropius, 1992, pp. 216-17).

In German, the term for design is “Gestaltung,” meaning “formation” or “form-giving.” “The problem of how to teach form-giving was at the core of the development of design education. Early design schools (such as the Bauhaus in Weimar) combined the teaching of form-giving skills and theoretical knowledge, with the purpose of creating a visual language that could be taught objectively; at the time, this was regarded as a crucial step to provide academic credibility to the discipline of design” (Ferreira, Christiaans, & Almendra, 2016, p. 114).

Johannes Itten directed the foundation course at the Bauhaus, where he taught the basic creative approaches and formal means of expression. The Itten model – “a systematic study of visual education and form-giving as the fundamental first step in a design student’s education” (Ferreira, Christiaans, & Almendra, 2016, p. 114) – was adopted by design schools worldwide.

This objective and systematic way of teaching often neglected the subjective ways in which Itten developed his methods before he came to the Bauhaus. This subjective reality, “this being on one’s own was very important for self-discovery” (Itten, 1965, p. 104). As Itten put it, “my teaching was designed to guide the student in acquiring the means of artistic expression by appealing to his individual talents and so develop an atmosphere of creativity in which original work became possible. Each student was expected to realize ‘himself,’ his original works had to be ‘genuine.’ ... I reached the conclusion that we must counterbalance

our externally oriented scientific research and technological speculation with inner directed thought and practice” (Itten, 1965, p. 105). In other words, even though a product has a form that is adapted to its use and its function, “when this form is liberated from limitation to a specialized end and serves also the purposes of an immediate and vital experience, the form is aesthetic and not merely useful” (Dewey, 2005, p. 121).

In the last decades of the 20th century, more and more researchers and designers started to have misgivings about continuing the application of modernist rules, in particular “form follows function.” Helga and Hans-Jurgen Lannoch (1989) claimed that the form is rarely entirely derivable from function. Pye (2000) stated that the purpose we assign to objects is variable and highly personal and not as singular or straightforward as the word “function” implies. “Product semantics suggests that a multitude of meanings can rightfully be presented for the same object type, a theory that cuts directly across modernism’s search for singular definitive forms” (Parsons, 2009, p. 32).

Creating a product form is not about objectively analyzing reality – it is a subjective interpretation of arranging planes, volumes, materials, and color. In doing so, the designer must be able to control how the product form is visualized and predict how the product form will appear. Form is the essence of something; it is all the things that give the product its character or its intellectual, practical, and emotional characteristics (Dewey, 2005).

Design is about building relationships and not just an object. For Paul Rand, “design is a relationship between form and content” (Kroeger, 2008, p. 29). It is form that gives a design “its cohesive composition that gains order and clarity from the relationship between the elements” (Meggs, 1992). Creation of form is never an end in itself. Its very meaning is inseparable from the need for expression; the more artists experience with form, the stronger their inner need to communicate the form will become.

Design involves feelings; the strength, the richness, and the order of the visual forms designers create depend, to a certain extent, on their life experiences and visual surroundings. However, today we live in a world full of handheld, multifunctional products, and it would be difficult for designers to stick to the principle of form following function, even if they wanted to.

Design is no longer a subject of anthropological, ethnographic or sociological analysis of product form, which evaluated objects in relation to their function and use. Design is moving away from being defined by materials and has started to be read as a text that materialize words, metaphors and analogies in product form. Design can therefore be considered a visual language, and even though it does not follow the same system as written language, it relates to the words defining human action. “Design is metaphorical, just as language is metaphorical... design is informed thought or emotion” (Hayakawa, 1956, p. 64).

Language organizes much of our experiences, both the concrete and the abstract encounters with the physical world and our responses to them. Language enables us to conceptualize, manipulate and invent new forms (Lannoch & Lannoch, 1989). “The typical form of framing experience (and our memory of it) is in narrative form” (Bruner, 1990, p. 56). By framing experience as a narrative, the designer organizes and constructs the excitement and emotion of the events into the product form. “The objective of such a narrative is not to reconcile, not to legitimize... but rather to explicate” (Bruner, 1990, p. 95). The narrative is an instrument that connects the quality, the emotion, the essence of the experience, the inspiration, and the trigger for the design of the product form.

2.6 Role of narratives

In the design process, designers tend to mitigate the influence of narrative through strict adherence to rituals and procedures and by appealing to logic and reason. However, narratives give design its life – it is no longer a set of materials, processes and price. Narratives set a context enriched with emotions. Polkinghorne (1988) claims that “human beings exist in three realms – the material realm, the organic realm, and the realm of meaning.” This last one is the domain of the human sciences, and developments in them suggest that the keys to understanding are furnished by narrative. Polkinghorne defines “narrative” as a story relating a series of events, either true or false. Narrative construction and comprehension correspond, he asserts, to “narrative rationality,” which “understands synoptically the meaning of a whole, seeing it as a dialectic integration of its parts.” (Polkinghorne, 1988, p. 35) Narratives bring order to designers’ experiences, as they unify material and emotional experience. Narratives impose order on the act of form visualization and “build a literal, rather than symbolic, model of human experience” (Ryan, 2006, p. 124).

Grimaldi, Fokkinga, and Ocnareescu (2013) broadly defines the narrative as a sequence of events told or interpreted by someone, therefore, they claim, any experience could be described or analyzed as a narrative. The narrative process results in the identification of a character (the essence of a product), the context-experience and the environment (elements of design) which are explored by designers during the sketching process. In a study based on Polkinghorne's approach, Kimberly Ann Gausepohl explored storytelling as an elicitation method, and found that narratives gave framework to product form, and the storytelling method improved the act of visualization in the design process. Storytelling supported motivation and the information processing ability, which, in turn, increases elaboration likelihood – this results in increased designer communication and engagement during the design process (Gausepohl, 2012).

Relying on the results of design research, there has been an increased interest in the verbalization of mental associations and narratives as a sense-making device. Rafael Lacruz-Rengel (2008) outlined that emotional qualities, experiential references, and expectational meanings provide the foundation for a comprehensive understanding of the representativeness of products from the standpoint of meaning construction. In this way, the essence of narratives becomes a theoretical instrument, a tool for helping designers discover new opportunities within the creative process.

Designers can extend and adapt pre-existing symbolic meanings through the design of objects, adding a layer of emotive expression by manipulating their form and creating objects that can communicate unique characters. For example, Alessandro Mendini's way of working is to find a relationship with people that he likes. In an interview in *Dezeen* he said: "So for example, I do not know if you know my Proust chair? It has a strong relationship with Proust, with Pointillism... It was 1978, and I wanted to realize a very enigmatic object: not painting, not industrial design, not sculpture, but something very mixed. I'm interested in transforming the objects in novels; it is a literary way of doing design. The objects are like personalities; all my objects are like characters. One is good, another one is bad. It is a kind of comedy and tragedy."

The Proust chair (*Figure 2-3*) demonstrates that the act of creation is very much a dialogue between the designer and the concept. The intimacy with the concept can be enhanced when the product stimulates the designer to create their narratives and rituals during form creation.

The act of designing reflects a fragment of our worldview, the story of our lives, neither beautiful nor ugly, but a clear appearance of the form. It begins as nostalgia for something already seen and forgotten. This imprecise, ambiguous, indefinite form can only be perceived and apprehended by our own experience.



Figure 2-3. The Proust chair

Mendini's way of designing is his capacity to narrate. A fictional, previously constructed dialogue with Proust and Pointillism that he took from literature and employed narrative to express his views and experience to others through his design of Proust chair. "The construction of self is inherently incomplete without the capacity to narrate – the ability to tell stories is not just communication with others; it is creating a coherent script, life story, or integrated matrix within which to make sense of one's life. Is there something about narrative in particular, different from other linguistic construction that makes us tend it to it emotionally?" (Worth, 2004). Barbara Hardy lucidly responds "We dream in narrative, daydream in narrative, remember, anticipate, hope, despair, believe, doubt, plan, revise, criticize, construct, gossip, learn, hate and love by narrative. (Hardy, 1968, p. 5)

The importance of the narrative as a form generator lies in the fact that it recalls previous images and their emotional associations, then coordinates them with new perceptions. The narrative becomes a way of formulating the new concept. The ability of narratives to communicate ideas and to stimulate imagination allows design to go beyond functional purposes and opens new perspectives to imagine, discuss and propose scenarios for the future in design fiction.

Designers' use the narrative mode based on their everyday experience, common knowledge, and stories, in the process of imagining and creating alternatives. Moreover, this capacity of

narratives in imagining design alternatives, the ways in which we interpret, construct meaning has been nonexistent or marginal in design education system.

Literature also suggests that narratives can play an important role in visualizing product form, and the study of the relation between product form and narrative, an area still largely unexplored, requires investigation.

We can conclude that as design is moving away from the tenet of “form follows function,” as the role of personal narratives is becoming more and more important. Designers have started to explore how the use of narratives can help them accomplish the most important goals of design – that is, communicating their intentions, creating context for the product form, drawing attention to their product and constructing something new. Recently, designers have put more emphasis on creating aesthetic, rather than purely utilitarian objects, as aesthetic objects can truly enhance the everyday lives of users by representing lasting quality and communicating unique messages and interpretations. Today, in the age of “decluttering” and “zero waste,” consumers want to relate to the objects they own; therefore personalized and customized products are more desirable. This is why it is of utmost importance to encourage designers to use narratives as a tool of recalling memories, images and experiences that would help set an original context for the finished objects so that users could identify with them.

Throughout the fieldwork phase, the focus was on exploring how and during what stage of the design process designers use narratives. We looked into their work methods and investigated how they saw their own designs – this was an important starting point when analyzing what role narratives played in their practice. We focused on how their well-established methods could be used to help design students and designers who find it difficult to come up with personal, novel and meaningful design solutions, which was put into practice during the workshops.

Chapter 3 Fieldwork

3.1 Unearthing designers' narratives

The fieldwork phase of the research aimed to explore the distinctive practices of professional designers and to document what inspired them in their creative process. Besides, several narratives were collected from designers all over the world to explore whether narratives help build meaning in design.

To understand the realities of design practice with regards to how designers visualize product form, nine highly-accomplished practicing designers – seven based in Italy, two in the United States – were researched upon. All of them had a long history of successful products. The intention was to understand how they arrived at the product outcome. What means do they use to visualize unique and original product forms? What role do emotions, subjective experiences and narratives play in this process? The meetings took place at the designers' studios or at exhibitions, and the method of research took the form of open-ended questions. These conversations were conducted in English/Italian – and were analyzed for the rich layers of subjective and expressive content.

3.2 Nine designers, nine narratives

Ettore Sottsass - i miss India

For Ettore Sottsass, a seminal figure in 20th-century design, literature was a metaphor for thought, therefore it had a profound effect on his work. He always gave his designs a name and a personality. He thought that form did not have to follow function anymore, as design was about communication. Sottsass often responded to images not principally as objects of aesthetics, but as if they were people or characters from fiction. “If I had to describe the color of the laminate, I’d talk a lot about grey: old age, neutrality, loneliness, etc. I could write a book about grey and so introduce a literary concept. My actual senses are literary, never pure like mathematics. They’re the outcome of stories, reading books” (Grandi, 2011).

When Sottsass and Perry King designed the *Valentine* typewriter for Olivetti (*Figure 3-1*), the distinctive color was calculated to bring vibrancy and fun into the office world of the 1960s. Sottsass declared that *Valentine* was invented “for use in any place but an office, so as not to remind anyone of monotonous working hours, but rather to keep amateur poets company on quiet Sundays in the country or to provide a highly-colored object on a table in a studio apartment... Its design was an elegant summation of his belief that successful, long-lasting product design is not solely connected to performance, but rather owed as much to the emotional force of design. The *Valentine*, with its distinctive coloring and marketing as a loyal, devoted companion, is a characterful object” (St. Hill, 2012).

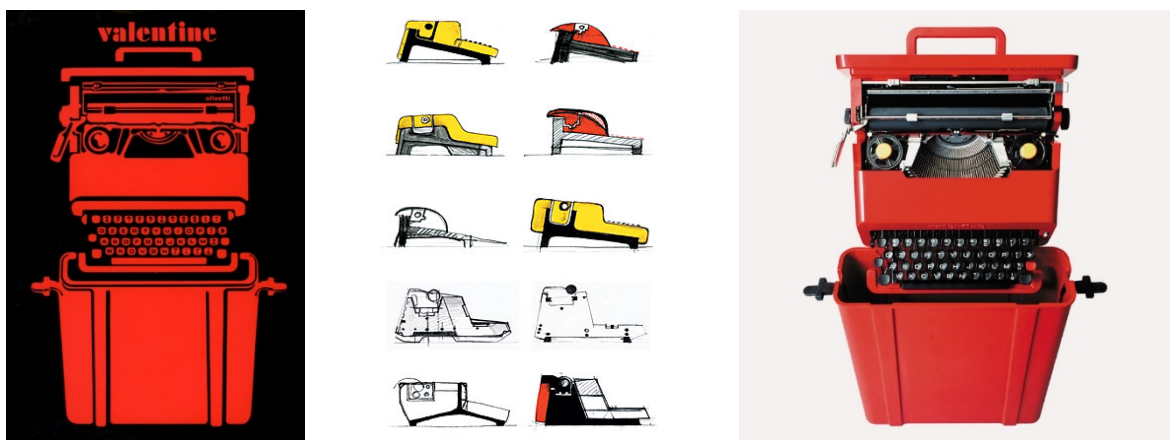


Figure 3-1. Valentine typewriter

During his lectures at the Domus Academy in 1984, Sottsass said that India was on his mind when he designed, and so was the USA. He regarded the elements of American pop art and the vibrant colors of India as expressive features, which could charge an object with cultural contents. In this way, his design gave objects an active presence rather than just a dull, opaque support for function.

Ettore Sottsass's spontaneous way of documenting his journeys yielded simple sketches (observations) that, in many cases, helped clarify an important design theme for his project, and was not a random inspiration. Given a catalyst, a designer's mind will process rich observations and narratives from her/his life experiences and crystallize these into design directions. His laminate project was inspired by his sketch of the temple of Madurai (*Figure 3-2*), which he made during his travels in India.

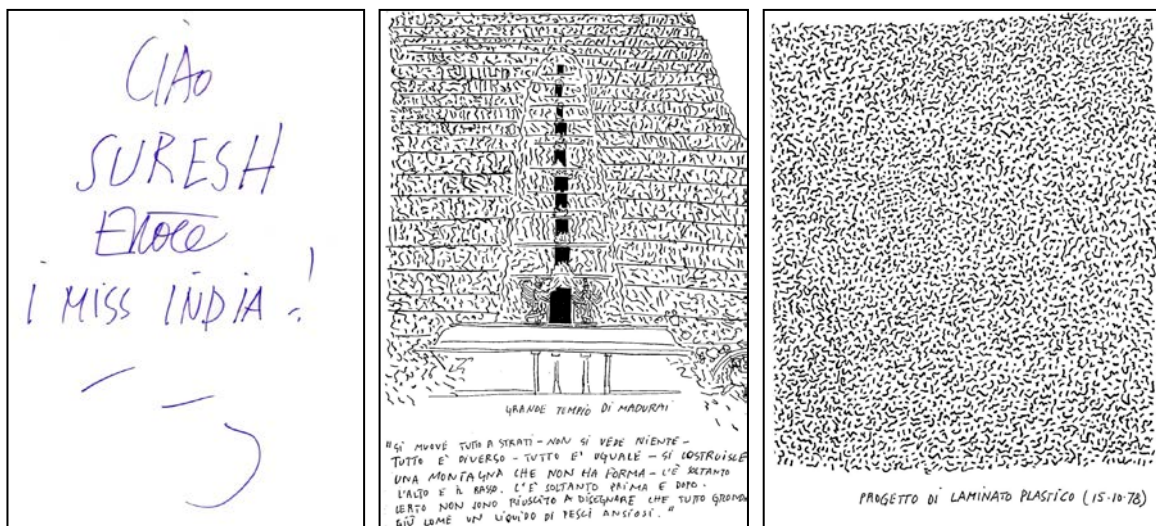


Figure 3-2. India in Sottsass's laminate project.

In 1985, he participated in “The Golden Eye” exhibition that brought Indian craft traditions and international designers together to create a collection of one-off products – product forms that narrated their journeys, their experiences and their attitudes. This exhibition led him to initiate his own collaboration with Indian craftspeople, resulting in a collection of objects (*Figure 3-3*) called *Bharata* (which translates, quite simply, as “India”). For many of his designs in the *Bharata* collection, the inspiration came from old houses he saw during his travels in India. C. V. Singh collaborated with Sottsass on this project to produce the prototypes for the collection in India.

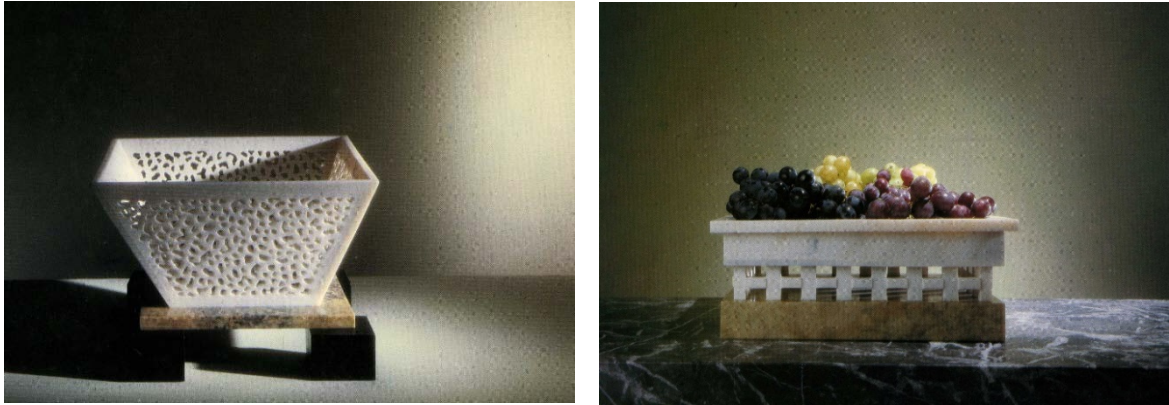


Figure 3-3. Objects from the Bharata series.

In 1988, he wrote: “It was clear that in every place I visited there were people who saw the houses, with great care... I regularly listen to these Indian voices... We can sometimes experience this determination without logic when we design and build a house” (Kaushik, 2015). As Barbara Radice, his wife and collaborator, wrote in her critical biography of him, “the journey to India, like the earlier one to America and perhaps more deeply, was to change his whole life.” He found something profound there. “There was the color and lushness of its physical reality, but mostly it was a spirituality transpiring into the visual world through rituals and objects – something in his own way, he would infuse to all his work” (Galvin, 2017).

Alessandro Mendini - the poetry of design

Alessandro Mendini chose the expression “The Poetry of Design” as the title of his exhibition in Seoul in 2015, as he believes that “if design becomes poetry, it will naturally touch people’s heart and reside in them.” The objects designed by Mendini showcased in this exhibition (*Figure 3-4*) are manifestations of his feelings, emotions, and experiences. “His method to arrive at a product form is personal. The process of realization of his works follows the procedures that can be understood because they are internal and almost intimate with himself” (Gioe, 2015, pp. 12-13). Mendini’s use of narratives to frame an idea and to create a concept is very much visible in the design of the *Anna G* and *Alessandro M* corkscrews (*Figure 3-4*), in which form and narrative emerge together as a reflection of each other.



Figure 3-4. The Anna G and the Alessandro M corkscrews.

Anna G's smiling face, sweet eyes and the peculiar haircut – the facial expression and the thin long-limbed body Mendini designed for the bottle opener is probably inspired by the artist and designer Anna Gili, Mendini and Alessi's good friend, that gave the name to the corkscrew. Her smiling face has become a cult figure. Mendini designed the second character, Alessandro M., a man shaped bottle opener, as a self-portrait, maybe just a little envious of the enormous success achieved by Anna G. (Alessandro Mendini - Anna G. My Corkscrew Doll dancing on a Bottle, 2013) For Mendini, drawing means creating signs, to carry out free and continuous movements of visual thoughts. The motivation of drawing does not stem from its efficiency; its beauty lies entirely in the love with which it is created. When Mendini designed the basic vase for Alessi's "100% Make-up" project, he wrote that "one thinks of the idea as an aesthetic factory, where the production of the pieces is intended as a multiplication of their soul" (Mendini, 1992, p. 21). In this project, one hundred designers were chosen to create "a constellation of visual stories" and express themselves

by producing a reality of their own on a vase (*Figure 3-5*). The vase was chosen as the common medium, as – according to Mendini – this is one of the most ancestral objects of mankind, and “these hundred designs will form the new group of vases that will join the crowd that populates the history of vases” (Mendini, *La Fabbrica Estetica*, 1992, p. 22).

All vases were wheel-thrown and cast in white porcelain, identical in form, color and material. The vases were then decorated with one hundred different designs commissioned from one hundred artists, architects and designers from Europe, Africa, Asia and America. Each design was then copied on one hundred vases, each vase being individually numbered and marked with the names of all contributing designers.

“Once again, ceramics become original, the mother of primary form and support for all possible expressions through the open language of a blank page, a text to be written, soul and skin reunited” (Morace, 1992, p. 85). This project showed that the meaning of an object can provide value that goes beyond its material characteristics and function, and “the meaning is not of what it physically is, but of what it expresses” (Dewey, 2005, p. 209).

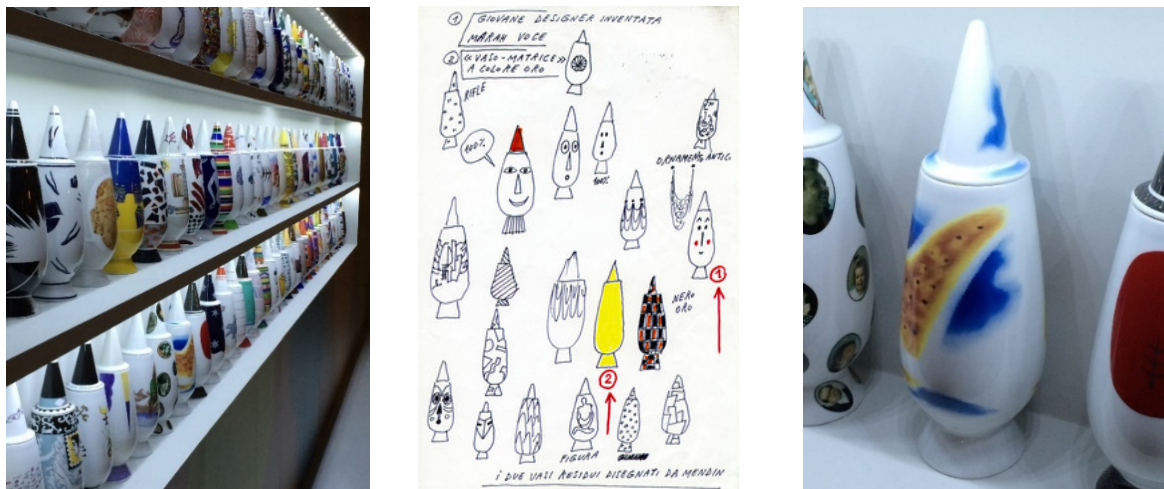


Figure 3-5. “La fabbrica estetica” – one hundred vases, one hundred narratives.

Andrea Branzi - unexpected shapes, surprising inventions

When asked about his design methods, Andrea Branzi said: “The only thing that forms the basis of my work is intuition, and the only thing I trust is my instinct... my theoretical and

teaching activities come precisely from this need to improvise, to understand and to investigate my own limits. In reality, my drawings are a result of reflection that I carry out even in the most unsuitable places, which are also extremely stimulating (see *Figure 3-6*). I've always been inside this profile which corresponds to my personal attitudes, that is, I try to carry out design as a form of reflection, an evolved form of thought, also as a knowable category... This sort of attitude of knowing the era in which we live not only through books, but through design, is what has characterized my work from the late 1970s to now; it has been full of changes but also a unified whole” (Branzi, Andrea Branzi Interview, 2003)

According to Branzi, “all industrial design for several decades boiled down to defining function and giving it a form – without considering that function is a highly complex variable that relates to cultural conditions, to public imagination. In order to redefine the concept of function, one must rescue it first from the schematization of ergonomic interpretations, and recognize its ambivalence, variability, and complexity” (Radice, 1985, p. 143).



Figure 3-6. Andrea Branzi's Tatzina

Today, everything that is produced is design, because the aesthetic and emotional components are fundamental requirements for a product to enter the market; nobody buys products that have no emotion, no personality, no charm. The freedom to search for new products, new technologies, new music, new narratives, new fashion, and new services demonstrates that our society expresses a continuous desire to reconnect individuals and history with fragments and narratives.

Andrea Branzi always makes useful objects, for example small pots, coffee cups (*Figure 10*) and vases (*Figure 3-7*), often working with potters' wheels and kilns, expressing new concepts and languages through novel forms. For Branzi, a vase is much more than a vase – it is a relational object between design and nature, between man and user; it is unique and beautiful. His work continues to be filled with “unexpected shapes” and “surprising inventions” – every work is delightful in itself; every work tells its own story. “Man has always covered his vases and his drinking cups with signs and marks. They are special signs, images that have been stabilized and filtered in order to convey information on the status not only of art, but daily life in general” (Branzi, 1990, p. 5).



Figure 3-7. Andrea Branzi's Profile Vase.

Massimo Morozzi - cultural narratives

Massimo Morozzi always said that design is a sort of fiction, at least the way we experience it. For him, design consists of stories that narrate something, and designers just have to let these stories be themselves and give them a destiny of being. In 1993, Mendini stated that each time Morozzi designs, “he gives life to an object that is totally new and autonomous from the others, he brings out each project in a strongly expressive climate, with the idea of transforming it into a personality” (Mendini, 1993). His designs are emphatically

recognizable with their own identity, have a strong presence, and are surprising and magical due to their archetypal character” (Morozzi, 1993).

Massimo Morozzi has transformed his daily life into objects; for him design is not just about functionality, it is about the concept, the idea, the story and about following your heart. For example, he designed the *Pasta-set* based on his interest in objects used in the Mediterranean for making pasta. His kitchen calendar (*Figure 3-8*) was realized for the presentation of the *Vapor Set* and was accompanied by a series of recipes by well-known chef Gualterio Marchesi. He was fascinated by the idea of cultural narratives, and the *Calendario* project was an outcome of his keen interest in indigenous cultures. To accentuate the popular nature of the iconography, the illustrations were made in India.



Figure 3-8. Massimo Morozzi's *Vapor Set Calendario*

Gaetano Pesce- goto

“Gaetano Pesce’s designs have seemingly irrational inconsistency of subjective moods and impulses” (Buchanan, 1990, p. 80). He personalizes the design object; his designs are provocative, figurative or symbolic, and they tell a narrative. The *Goto* vase/cup (*Figure 3-9*) designed by Pesce in 1995 has the text of “Toast to Venice” molded onto the vase/cup in the shape of the head of the Lion of San Marco. Each *Goto* cup/vase is unique – all of them are hand-cut and made of different soft-cast resin colors.



Figure 3-9. *Goto* by Gaetano Pesce. The Italian text on the vase/cup in English is as follows:
 “A toast to Venice, so that she becomes a focus of modern lives, modern behavior, progress, services, joys, optimism, discoveries, trust in the future, courage, openness to the culture of the contemporary world... and not a place of prejudice, protection, conservatism, immobility, soporific location, museum-cult of the past, reactionary example, hopeless venue for future generation, full of torpor, provincialism, mute and nostalgic enterprises... Let’s get rid of this mask, which claims Venice a space to live in.”

Pesce’s idea of a diversified series production is about mass-produced objects for the home that retain a one-of-a-kind look. This is partly achieved by giving the object a handmade look, even if it is mass-produced. People want to own something that is unique. Pesce believes that customization is the future – mass products with unique offerings, mimicking the consumers’ lives.

Francesco Binfare – the africa farfalla table

Francesco Binfare’s work is born from unexpected ideas, epiphanies and dreams. An example for this is the *Flap* sofa: in Binfare’s words, the project was “a result of a very strong dream. I dreamt of a red island flooded by black oil pouring down from the sky. Yet, when I woke up, one end of that island was left. I had no pencil or pen, but I cut out the shape of that island.” In this sense, the *Flap* is an example of a spontaneous and lively interaction.

In the Africa “Farfalla” (meaning “butterfly”) table, (*Figure 3-10*) Binfare tried to create a positive shape, as well as harmony, strength and beauty. “Sacred territories are usually elevated, flat and compact, and in this sense a table is also high territory. The primary metamorphoses of human life take place on the table: you consume food and you work on it. Around the table, you meet people to discuss things. With the *Butterfly* table, I intended to evoke the primary and sacred aspects of life. For Vedic rituals, it had to have a shape that alluded to flying. I’m interested in the ritual, devoting my work to the representation, to the beauty, to the sensuality of the gesture. I felt the need to do something physically important, to get in contact with the body and the sacredness of life. The *Africa Butterfly* is a table that can be made based on the original, custom-only model and cannot technically be part of a serial stock” (Binfare, 2016).



Figure 3-10. The Africa Butterfly table by Francesco Binfare.

Giovanni Levanti - sneaker and solidino

Designed by Giovanni Levanti for Campeggi, *Sneaker* (*Figure 3-11*) is a home-gym. It’s a functional piece of furniture that can be placed in any room of your home. It combines an exercise ball with a trampoline for a variety of cardio workouts and stretching. Levanti’s creations are refined and playful. His main purpose is not to astonish at all costs, but rather to follow an unexplored path through ethical, patient and meticulous research and create objects that are sustainable and bring joy to the user.



Figure 3-11. *Sneaker* by Levanti.

According to Beppe Finessi, “for Giovanni the words ‘silence,’ ‘serenity,’ ‘intimacy,’ ‘inspiration’ and ‘beauty’ are important words which should never be forgotten in our work and thoughts. Giovanni is somebody who deliberately shuts himself away in his own silence, meticulously elaborating upon his own everyday gestures armed with his own thoughts, somebody who, over the last twenty-five years, an outsider and loner deep down in his heart, has never lost his innocence, a young boy who still gets excited and has a real sparkle in his eyes” (Finessi, 2010).

Giovanni grew up in Palermo, Sicily. He spent a lot of time on the sandy beach. In summer, the beach was always filled with families soaking up the sun. These experiences have provided inspiration for his designs. The shape inspired by a pine cone, the Sicilian symbol of fertility, led to the *Soldino* (Figure 3-12), and as Giovanni states, “the name ‘Soldino’ reminds one of childhood.” *Soldino* is a small pottery moneybox in different colors inspired by semi-precious stones: moonstone, amber, turquoise, cornelian, mother-of-pearl, garnet, and jade.

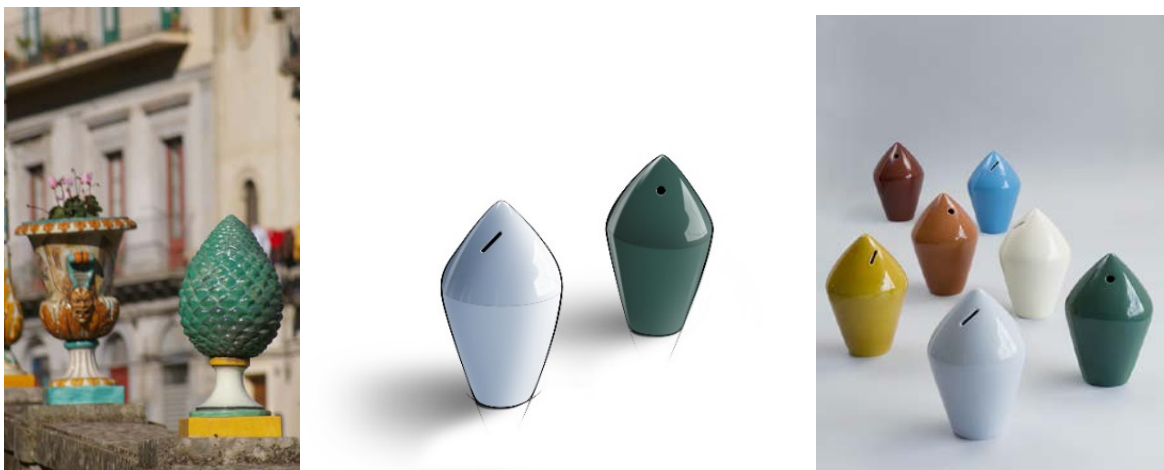


Figure 3-12. Levanti's *Soldino*.

Clare Brass - Kutch containers

In 1993, Clare Brass designed Kalisto containers for Alessi (*Figure 3-13*). The inspiration for her design came from the images and objects she found during her travels in India. Through narrating her experiences, Clare shared the images and objects that she saw during her travels. Processing these images led her to conceptualize these extremely subtle and unique containers. “After all, in the act of designing, design is constantly generated from transformation of observations, memories, and experiences” (Erlhoff, 2015, p. 75).



Figure 3-13. Kalisto containers for Alessi by Clare Brass.

Constantin Boym - learning from mabkhara

His two-and-a-half-year sojourn in the Arabian Gulf was a memorable experience for Constantin. Inevitably, this experience adds to one's outlook, way of design and to how one sees things.

“Ever since I came to the Middle East, I have been looking for authenticity. Tourists and visitors often search out authentic food. As a product designer, I wanted to find local, truly authentic products: things invented here, made here, and used here by the locals and their families. This proved to be far from easy. The vast marketplace – from souks to supermarkets – offers products that inevitably fall into one of two categories: multiple reiterations of European/American prototypes, or commercial items specifically concocted for tourist consumption... Then I discovered something called mabkhara (*Figure 3-14*) – the incense burner. Functional requirements for an incense burner are very simple. The object has to be sufficiently stable, and a good handle for taking it around is a plus. The top, where one places a burning charcoal briquette, must obviously be fire resistant. Beyond these simple needs, the object can take any imaginable shape and almost

any size. And it does. Form does not follow function here... When a designer stumbles upon a new, relatively unexplored product typology, he or she immediately starts thinking about making a design contribution of their own” (Boym, 2011).



Figure 3-14. *Mabkhara* by Constantin Boym

3.3 Designers’ narrative methods – an overview

These examples express particular sensibility about objects and their context and a personal way of looking at the world. In these objects, the designers have seen the world in their own way and brought perspective to their work. The nine designers were inspired by their own personal observations of the world (their life journeys and experiences) and saw beauty, poetry and meaning that others had not noticed. In each case, their insights emerged from activity and thinking that was not part of a highly structured/formalized design process. However, their approach was certainly not without discipline or rigor. Each case involved a similar pattern, as well as focused curiosity, coupled with exposure to relevant contexts. All nine designers paid attention to elements that encouraged them to think about what was significant to the exploration of design choices and details (Table 3-1).

Table 3-1

Constituent elements of the nine designers' experiences

Designers	Intuitive	Emotional	Memory Place \ Journey	Abstract	Figurative	Narrative	
Ettore Sottsass	√	√	√	√	×	√	Metaphorical
Alessandro Mendini	√	√	?	√	√	√	Literary
Massimo Morozzi	√	√	?	√	√	√	Fiction
Andrea Branzi	√	√	√	√	√	×	Theoretical
Gaetano Pesce	√	√	√	√	√	√	Customization
Francesco Binfare	√	√	√	√	√	√	Epiphany
Giovanni Levanti	√	√	√	√	×	√	Playful
Clare Brass	√	√	√	√	×	√	Precedent
Constantin Boym	√	√	√	√	√	√	Discovery

First-hand exposure to people, places, and things seem to be of key importance for designers, but there is no formulaic method for observation of this very personal kind. “It is these design drawings, sketches, scribbles, diagrams and the like that most offer this conversational potential” (Lawson, 2005, p. 279). Form is conceptualized as a kind of narrative between the experience and the sketch, conceived as an intuitive act of balancing designers’ tensions. These outcomes are not mechanical but a product of the designers’ experience, in other words, they are the designers’ narratives put on paper.

3.4 Designers’ dialogue with their sketches

In the next phase, a survey questionnaire (*Figure 3-15*) was sent by email to design professionals globally. The aim of the survey was to establish if designers use images and memories from their own lives to visualise forms at the earliest stage of the design process. All in all, eighty-one responses were collected. The survey responses were mainly from industrial designers, architects and a few graphic designers. They worked within large corporate design studios or ran their own practice. They all had developed products for a minimum of two years (Table 3-2), and at least one of the products they designed was on the market.

Survey Questionnaire

1. Name: _____
2. Design specialization: _____
3. Years of experience: _____
4. Please rate how often you use the approaches below to tackle a design problem.
(Put a cross to specify the regularity.)

Approach	NEVER	1	2	3	4	5	ALWAYS
<i>Emotional and Intuitive</i>	☐	☐	☐	☐	☐	☐	
<i>Research-based (consumer/market)</i>	☐	☐	☐	☐	☐	☐	
<i>Adapted from existing design/project</i>	☐	☐	☐	☐	☐	☐	

Figure 3-15. Survey Questionnaire I.

Table 3-2

Years of experience of the participating designers

Years of Experience	Number of Designers
Between 2 and 5	15
Between 5 and 10	24
Between 11 and 15	18
16 and 20	3
21 and above	21

The participants reported their approach and working method preferences (*Figure 3-16*). These results show that the majority of the designers considered the emotional-intuitive approach to be the most effective when tackling design problems.

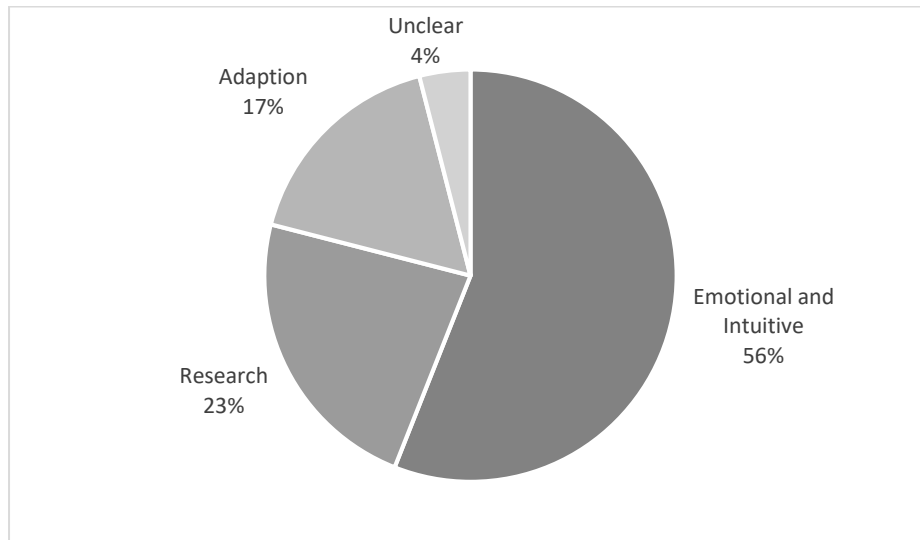


Figure 3-16. Participants' methods.

When tackling design problems, designers depend significantly upon intuition and emotions, and even when they rely on research to analyze a design problem, personal introspection plays a crucial role when they visualize the product form. 17% of the 81 participants answered that their design outcomes were derived or adapted from a similar product. They also stated that they usually used several sources to visualize product form.

The 81 designers were also asked about sources of inspiration when visualizing product form. To this end, Questionnaire II (*Figure 3-17*) was created and sent to the designers by email.

Survey questionnaire II

1. Name: _____

2. Design specialization: _____

3. Years of experience: _____

4. Designers embrace intuitive or tacit knowledge in different forms (e.g. images, stories) at the early stage of the design process.

a) Do you use images/words/stories for inspiration?

☐ YES

☐ NO

b) Do your experiences (travel / art / childhood memories etc.) influence the choice of imagery/story that you take forward?

☐ YES

☐ NO

c) Does this process improve the efficiency of the ideation/originality of the final work?

☐ YES

☐ NO

Figure 3-17. Survey questionnaire II.

The findings of this phase were that drawings and sketches produced at the initial stages of the design process are often drawn based on the designers' experiences (*Figure 3-18*).

95% of designers said they used visual impressions of their experiences or other images to generate ideas, and they claimed that this method improved efficiency.

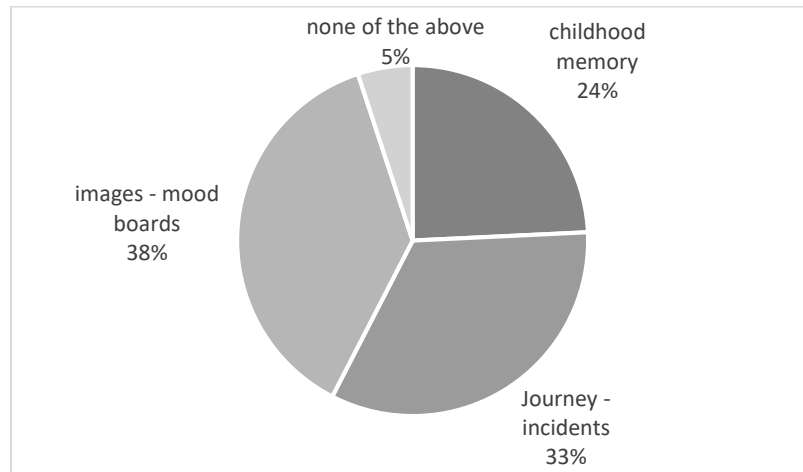


Figure 3-18. Survey questionnaire II results.

A third questionnaire (*Figure 3-19*) was also sent out to the 81 designers to collect examples of their design projects.

Survey questionnaire III

1. Name: _____
2. Design specialization: _____
3. Years of experience: _____
4. Illustrate the use of imagery with an example from your projects/designs – share a design / a sketch/ an image/ a photograph and explain the project briefly.

Figure 3-19. Survey questionnaire III

The third survey identified the significance of the use of narratives, images and lived experiences in concept generation during the design process. The survey also revealed that when tackling design problems, it might be useful for designers to connect these problems to the way they experience the world, as this would help them decide how to visualize the product form. Being able to see these often invisible or forgotten experiences is a way of creative language use – it allows the designers to play with what otherwise might constrain them. Form is conceptualized as a kind of narrative between the experience and the sketch, conceived as a balancing act of designers' inner tensions. These results and the conclusions of the fieldwork provide a basis for developing a design framework using images, stories

and lived experiences to support the efficient ideation and realization of product form. Some examples from the survey to illustrate the findings can be seen and read below.

Survey Response 1 (Mario Fioretti)

“When I was a little boy, like many others, I used to draw on every surface I found. In the Aquarela Fridge Project, (*Figure 3-20*) we are looking for a way to encourage people to leave messages on the fridge door. There was an obvious relationship between this memory from childhood and the solution we came up with, developing a system of specially painted fridge doors as well as ‘whiteboard’ pens and erasers, magnetically available on the product.”



Figure3-20. Aquarela fridge by Mario Fioretti

Survey Response 2 (Mansour Ourasanah)

Lepsis is a solution to environmentally-hazardous meat production and world hunger. (*Figure 3-21*) The design process that led to this solution was a personal journey down memory lane. “As a child growing up in the African nation of Togo, eating grasshoppers and winged ants was a cultural ritual and a source of protein. So when it was time to find a

solution to environmental and nutritional woes, the inspiration of the childhood experience led me to design a kitchen/tabletop terrarium for farming grasshoppers, harvesting them and turning them into food within the comfort of a modern home. *Lepsis* is made up of three parts: a nest in which the insects grow, a harvester which allows the user to collect them when they have grown to the right size, and a light trap which lures the insects into the harvester. All three parts come together beautifully to create a unique ecosystem tailored to the user's lifestyle and nutritional needs.”



Figure 3-21. *Lepsis* by Mansour Ourasanah.

Survey Response 3 (Jim Costello)

Recollecting memories of childhood, of having a red toy wagon he managed to produce entirely, a the first ‘Cooler on Wheels’ design with which his clients have had great success (Figure 3-22). When Jim shared his memory; his face expressed a childish joy, as if it brought him back to times when he was a child. He fondly remembered the fun he had with his red wagon, tugging it around all the time –and maybe he carted a block of ice on his wagon one summer afternoon!



Figure 3-22. Cooler by Jim Costello and Costello's childhood toy wagon.

Survey Response 4 (Clear Liu)

When designing this refrigerator accessory in the Whirlpool SH studio, an idea flashed through Clear Liu's mind. The design inspiration was a traditional Chinese basket called *long ti*. His childhood memory of the two basket in his house, each with four compartments, lend itself well to the concept of the design of 'Cool Box'(Figure 3-23).

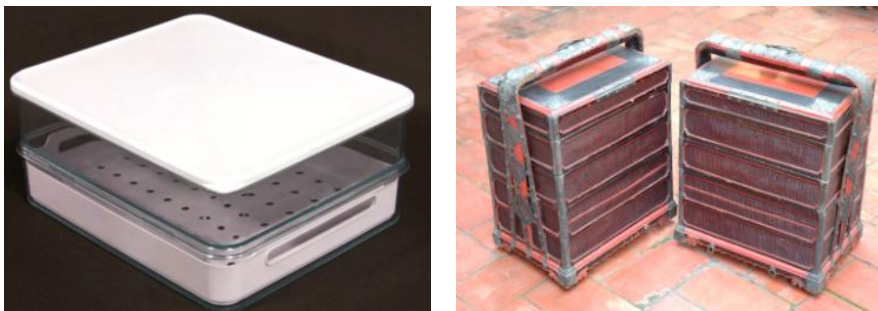


Figure 3-23. Cool box by Clear Liu.

Survey Response 5 (Koz Susani)

"The coffee collection we designed in 2013, (Figure 3-24) for the company Verreum is an emotional, contemporary interpretation of coffee cups. We wanted to celebrate the color and sensorial qualities of the coffee itself by making it visible: through the glass, one can see the layers of a cappuccino or an espresso, and the dark color of the coffee. In addition, for the espresso, we wanted to 'raise it' in the same way a wine glass puts the wine on a stem. So,

the espresso cup is suspended higher in the glass, to celebrate the ritual of espresso drinking.”



Figure 3-24. Aurora by Koz Susani.

“In the Italian culture, the espresso ritual is a fast but essential event: the name ‘espresso’ means fast, and we drink it by standing at the bar counter, in one minute. Nevertheless, it is an important moment because it is part of the culture. Our design for this coffee collection has a strong emotional connection with this ritual.”

Survey Response 6 (Ashish Gupta)

“While exploring external handle concepts for a refrigerator, the image of the earthen pot (Mataka) so prevalent in Indian villages came to mind. There, the Mataka, and not a refrigerator, is the source of cold water. The top rim of the pot has a beautiful, sculptural form, which was an inspiration for the new handle design” (Figure 3-25).

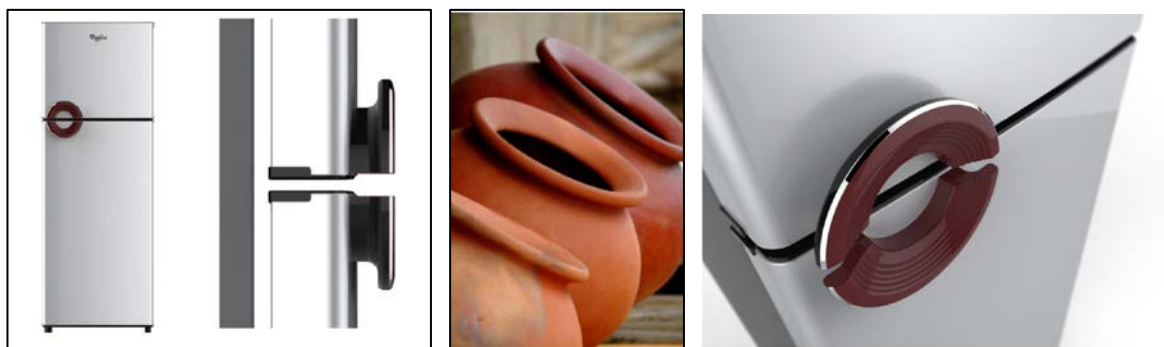


Figure 3-25. Fridge handle by Ashish Gupta

Survey Response 7 (Sumit Singh)

“While designing a range of toys, the inspiration of a toy dog (*Figure 3-26*) came from the dachshund we had at home during my high school days.”



Figure 3-26. Toy by Sumit Singh

Survey Response 8 (Jorge Moreno Arozqueta)

For Jorge, “attraction and repulsion in nature have a clear visual language. Designers, just like nature itself, can manipulate shapes and colors in order to provoke feelings, emotions, and behaviors that communicate messages to the users... One difference between humans and animals is in the relation between seduction and love. Seduction exists in the animal kingdom, but love does not. As a cactus can attract animals with its colors, so does *Luzuria* (*Figure 3-27*) attract its users into a game of seduction in which light plays the main role; the more we get undressed, the less light we will have.”



Figure 3-27. *Luzuria* by Jorge Moreno Arozqueta

Survey Response 9 (Sharad Chauhan)

Sharad Chauhan’s designs radiate timid tenderness, and he builds his world around sensuous curves and pure forms. As Sharad puts it: “Walking on the river beds as a child

and running to the temple every morning was an essential part of our everyday routine. Born and raised in the holy town of Rishikesh, in India, living by the banks of the river Ganges and being brought up in a profoundly religious house, has made a deep impact on the way of designing.”

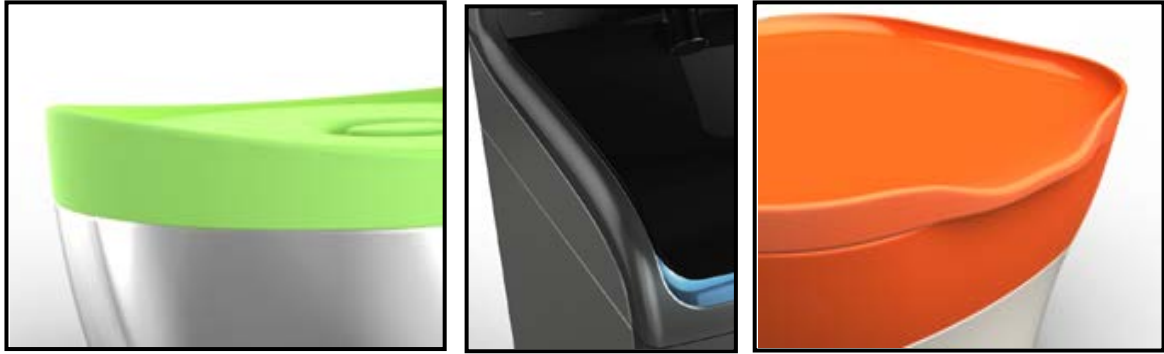


Figure 3-28. Sensuous details on products designed by Sharad Chauhan.

Chapter 4 Workshops

4.1 Proposal for the Three-Step Narrative Process

As Johannes Itten observed, “a need exists to develop a designer’s intuitive nature and the ability to see possible future images” (Itten, 1967). How can we visualize form so that it will have some emotional meaning? Our objective is not to research a specific type of narrative but rather to focus on the use of narrative to generate product form. We take an event – something that has happened to us or something we have heard – and shape it into a narrative to tell it to others. In some ways, it is much more natural for us to organize content into stories than it is to fit it to the assembly line procedures of objectives, content, methods and evaluation.

Jerome Bruner has highlighted the importance of narrative thinking, the knowledge of the ways in which we interpret, construct and use stories. Building on narrative as a starting point, and taking cues from his book *Acts of Meaning* (Bruner, 1990):

- The narrative is a sequence of events and expressions – whether real or imaginary.
- The typical form of framing experiences is the narrative form.
- The function of a story (narrative) is to find an intentional state that mitigates or at least makes comprehensible, a deviation from a canonical cultural pattern.
- Through narrative, it becomes obvious that there is an ineluctably “human” side to making product form.

- Narratives trigger searches for “meanings that inhere like their departure from ordinary usage.”
- Product form achieves its meaning by explicating deviations from the ordinary in a comprehensible form – by providing the “impossible logic.”
- The narrative is an especially viable instrument for social negotiation.

Narratives enable us to more richly express what we mean and to understand complex forms. The minimum definition of narratives includes characters (or entities, existent, inanimate characters) and a chain of events. *Figure 4-1* depicts the narrative process of visualizing product form, proposed by this thesis.

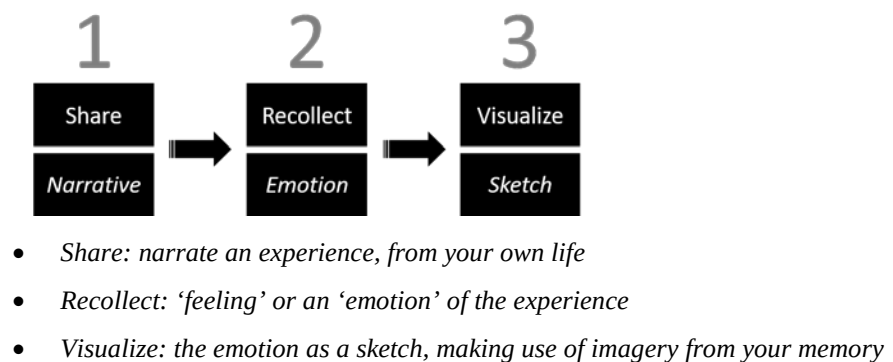


Figure 4-1. Three steps narrative process to visualize product form.

In this experiment, it was important to encourage designers to leave their comfort zone and to draw the idea from their own experience, adding a layer of emotion to otherwise mundane marketing design briefs. The focus was on developing each person’s ability to look inside themselves to find their potential in rediscovering design. Designers’ ways of thinking can play an important role in the development of creative alternatives. Valuable cues and ideas can also arise by examining feelings, intuitions, and emotions.

Seven workshops were conducted in China, India, and Singapore at design schools and the in-house design studio of an appliance manufacturing company, using the three steps narrative process, to visualize product form using narratives and test its usefulness as part of the design conceptualization process. The workshops revolved around two main questions:

Q1. How could a framework/process be developed to help designers embed narratives in the act of visualization?

Q2. How useful would this framework/process be and why?

4.2 Workshop 1: Narrative on a Cube

In the first workshop the aim was to discover the use of narratives and personal experiences to visualize a cube. The research set off to find out how design students visualize narratives on a cube.

Workshop theme: Design the surface of a cube which is inspired by an incident from your own childhood.

Participants: A class of twenty students from the Industrial Design Department of The Indian Institute of Technology (IIT), Bombay. Seven of them were female (35%), and thirteen were men (65%). The participants' age ranged from 24 to 27 years, with an average age of 25 years.

Procedure: The instructions asked the students to narrate an incident or an event from their childhood. Having narrated the incident, the next step was to visualize this narrative as a drawing and, finally, to map it on a cube.

Results: The original goal of constructing a cube became more personal and fun due to the narrative visualization. Their dialogue with their own narrative, getting cues from their own lives for elements of design, engaged the students completely, and they were surprised by the final solutions (*Figure 4-2*). As Burnette (n.d.) explained, “imagination organizes, manipulates, analyzes, and edits these intentionally selected objects of thoughts and rational structures until a good fit is obtained between information, intention, and situation or subject that motivated the intention” (Burnette, 2013)

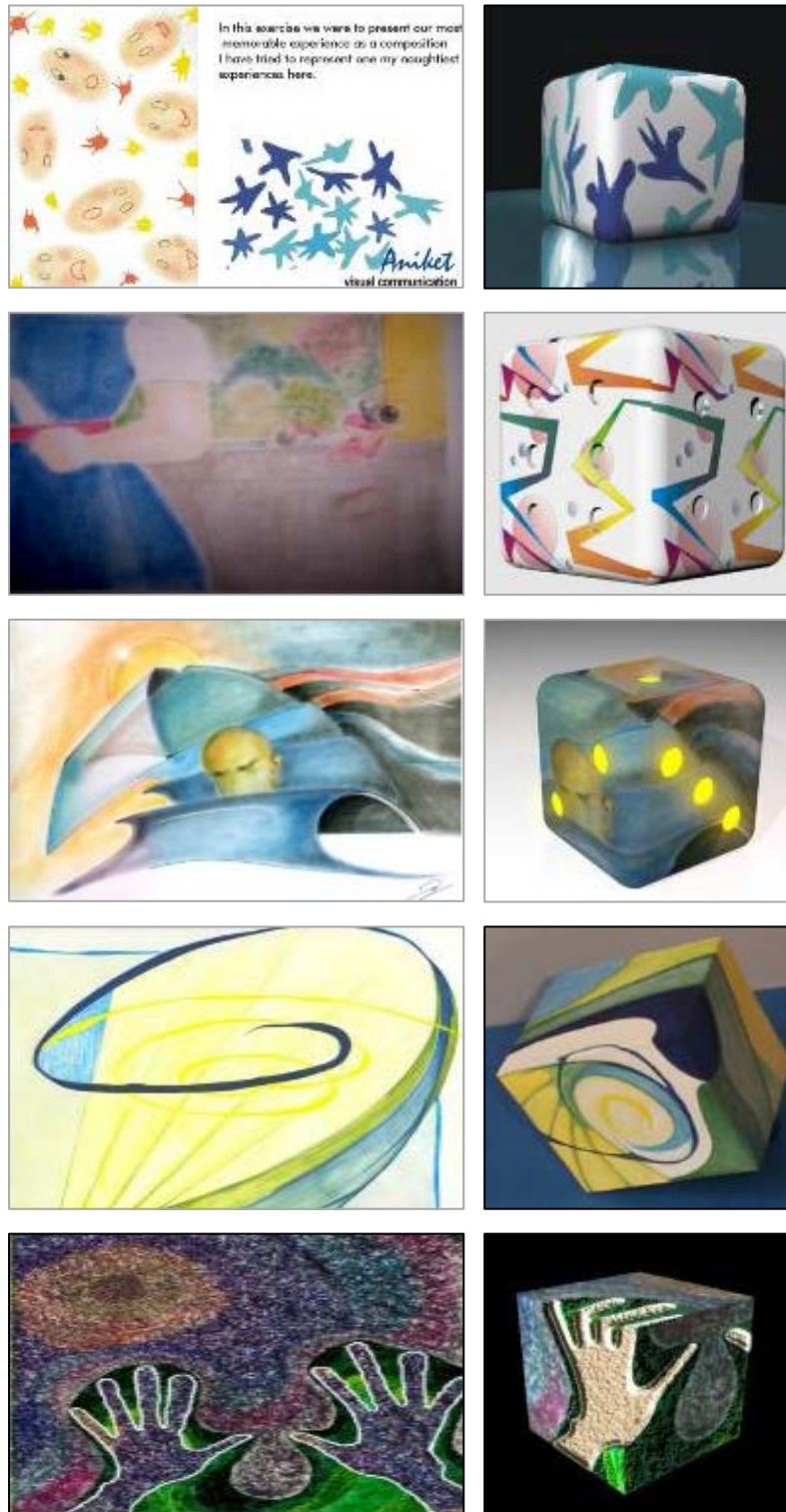


Figure 4-2. Narratives on a cube.

4.3 Workshop 2: Memory Containers

Giving meaning and contextual richness to the elements of form is essential for creating an original design. The designers' task was to narrate and sketch personal experience. The sketch was then developed into a three-dimensional form. The students had to investigate the emotional and personal qualities of an experience, as well as the way ordinary things are shaped and used in our everyday lives. This became the starting point for designing a container.

Workshop theme: Design your own container that is inspired by a memory of an incident from your childhood.

Participants: A “3D Foundation Studio” class of sixteen students from the School of Art, Design and Media of Nanyang Technological University, Singapore. Ten of them were female (62.5%), and six were men (37.5%). The participants' age ranged from 19 to 22 years, with an average age of 20 years.

Procedure: The instructions asked the students to narrate an incident or event from their childhood. Having narrated the incident, the next step was to visualize this narrative as a drawing and, finally, to create a container. The process (*Figure 4-3*) was made up of three parts – share, recollect and visualize – in the following way:

- Share an experience from your own life (“discover”)
- Recollect the ‘feeling’ or an ‘emotion’ of the experience (“define”)
- Visualize the emotion as a sketch, making use of imagery from your memory (“design”)

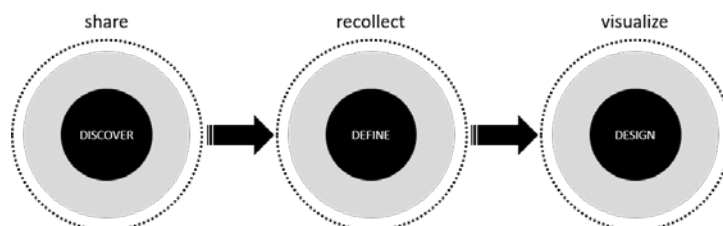


Figure 4-3. The three-step (S-R-V) process to visualize product form.

Results: The final image, which became the intended “design idea,” gave meaning and contextual richness to the elements of form, therefore it was essential for creating an original design.

Su Fang’s summer holidays were spent at her grandparents’ house in Malaysia. The house had a huge garden and she has warm memories of spending happy times there. The images of her own experience became the starting point of her design (*Figure 4-4*).

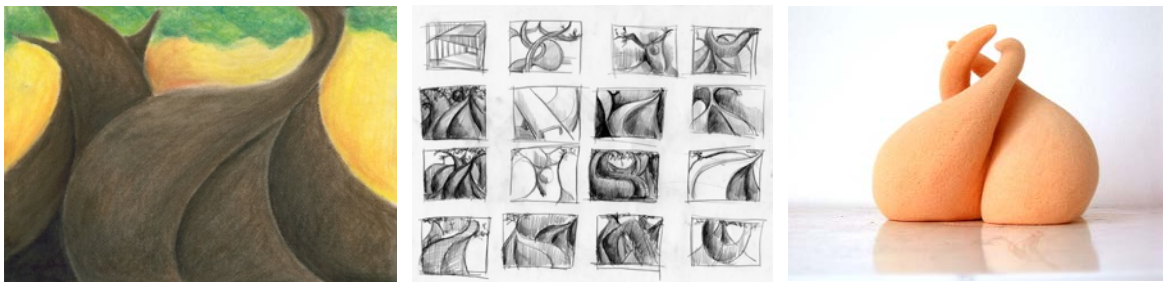


Figure 4-4. Su Fang’s memory container.

Magdalene’s mother used to tell her stories on the swing they had in their house – often before her bedtime – and she loved it. Her fascination with the moon led her to sketch the lamp as a swinging moon (*Figure 4-5*).



Figure 4-5. Magdalene’s memory container.

Xun remembered a worm in an apple she ate as a kid, and her sketch of that incident gave her the inspiration for her concept of a container (*Figure 4-6*).

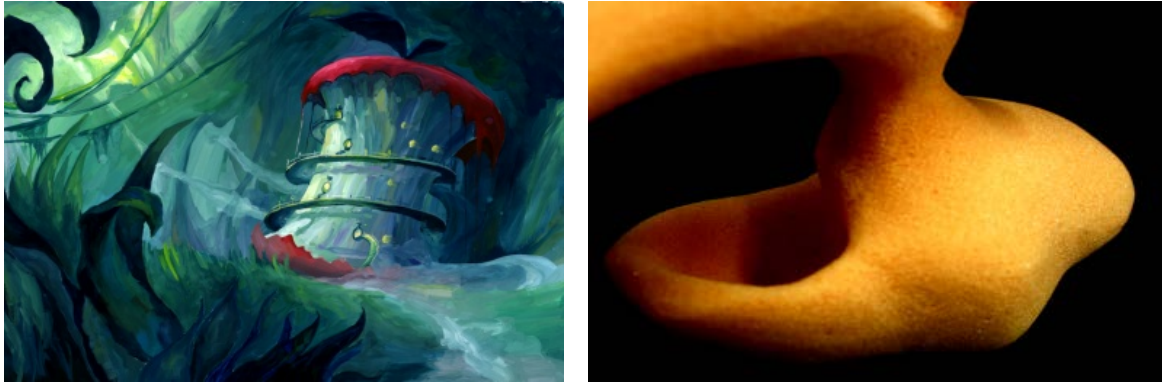


Figure 4-6. Xun's memory container.

"I remember that most of the time my younger sister and I were left at home alone, because our parents were working. We would spend our afternoon playing all sorts of games. We would have lots of fun together, giggling and laughing, but we also quarreled and cried in the empty house until our mum called home during her tea break. The connection between our world and my mum's, at that moment, was through the phone. The phone (*Figure 4-7*) sent our mum's comforting voice to our happy and chaotic world."

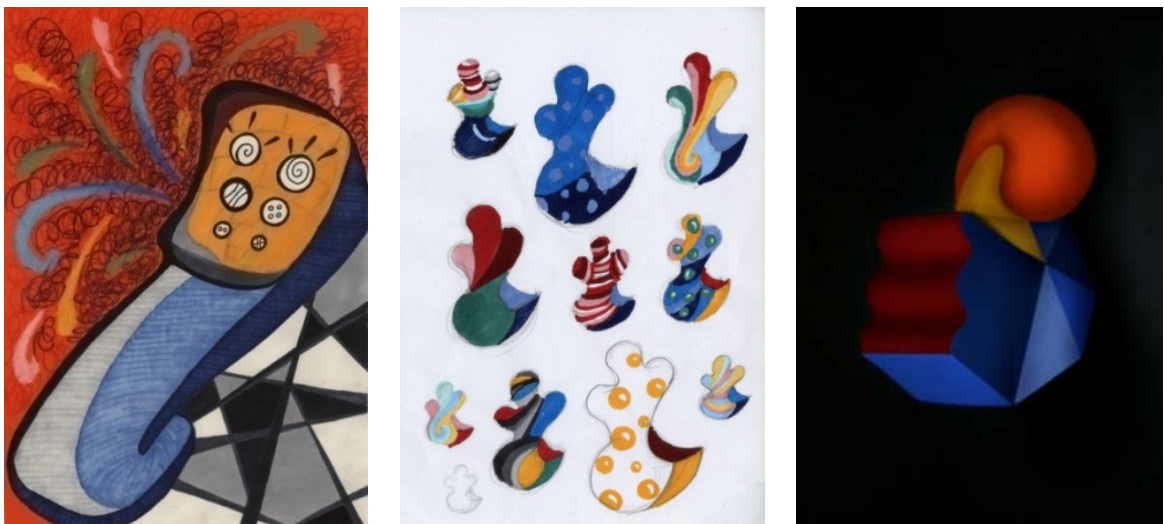


Figure 4-7. Jesslin's memory container.

4.4 Workshop 3: De/light – narrative to a lamp

The class project was to sculpt emotions with light. Lighting is an integral and dynamic part of our life. Light lives, changes, and it can express many things – it brings inert spaces to life by relating them to the human spirit. Emotions are connected to memories, places, people, visuals, and aromas – or to all of these at the same time – so they can build new sensibility that can turn the immaterial into a positive experience of space, place and meaning. The designers' narratives had to emerge from their own lives and these narratives were then developed as lamps.

Workshop theme: Design a lamp that expresses your emotions regarding a personal experience.

Participants: An “industrial design studio” class of ten students from the School of Art, Design and Media of Nanyang Technological University, Singapore. Five of them were female (50%), and five were men (50%). The participants' age ranged from 22 to 27 years, with an average age of 24 years.

Procedure: The instructions asked them to narrate an incident or an event from their childhood. Having narrated the incident, the next step was to visualize it as a sketch or a drawing and, finally, to create a lamp.

Results: Students capacity to render their experience as the narrative, is an instrument for making meaning, to explicate, provides them with a way of sorting out their thoughts. The elements of the lamps emerged from what the students observe in their environment and what they will connect from their past life with this direct response. The narrative is providing that setting of interest, excitement, and emotion for the students to sculpt these beautiful lamps.

This lamp (*Figure 4-8*) hides Yanying's nightingale inside, and the bird sings every night. The concept is full of love, and it touches something deep within, bringing joy and lightness into any room.

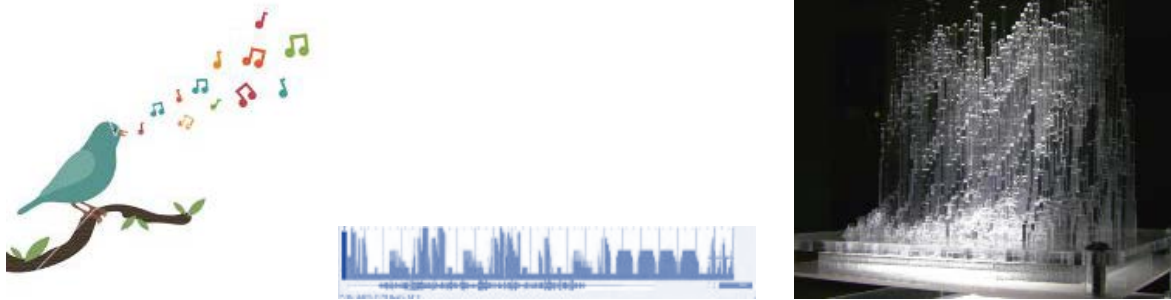


Figure 4-8. Yanying's nightingale lamp.

A night drive is a time when the deepest thoughts flow. Like a car travelling on an endless highway, thoughts can also travel. Under the sea of a myriad colored lights, there is a calm, quiet and relaxed feeling. Serene always feels this quiet calm when she looks out of the car during such drives. Her installation, "Night Drive" (*Figure 4-9*) is light in motion. By calming the emotions of the viewers, it allows them to experience serenity and calmness.



Figure 4-9. Serene's Night Drive.

Brian's lamp (*Figure 4-10*) captures the poetic potential of light, the design of a cup of warm coffee and the aroma of cinnamon.



Figure 4-10. Brian's Cinnamon Lamp.

Can you imagine glowing fireflies transforming into a radiant design? Frankie's design is powerful but soft, it is rhythmic, but calm and it brings hope. Frankie could transform his memory into this unique prototype (*Figure 4-11*).





Figure 4-11. Frankie's Pulsating Lamp.

By using a pillow as the form and experimenting with scale, light, color and multiplicity, Sharifah was able to transform an ordinary, functional item into a challenging new object that is both stimulating and playful. The sudden glow of light in different locations highlights the inner layers of the pillow, invoking the spirit of motion to bring an otherwise static homeware to life. The mood of the lamp is playful but serene. The expressive and emotive qualities light possesses change the way the user sees the dark environment. Functionally, the pillow becomes an original night light (*Figure 4-12*).



Figure 4-12. Sharifah's Pillow Lamp.

4.5 Workshop 4: Narratives based on colors

The idea of the fourth workshop was to reconstruct a system of expressive and emotional relationships between the user and the color of the home appliances of his or her living environment.

Workshop theme: Incorporate the power of color into your design. Tell your stories with colors that you can eat.

Participants: Three female designers participated in this study. The first subject was an industrial designer (FG) and the second subject was a textile designer (SK) – both worked in the in-house design studio of an appliance manufacturer. The third subject was a student of textiles (AP) in her final year of master’s studies, doing her internship with the same appliance manufacturer. All three participants were part of the “Color Finish” and “Material” groups in the design studio.

Procedure: Two participants were given the following quote from Ettore Sottsass: “Colors are like words; with colors you can tell stories.” Images of fruits and vegetables were shared with them, and these could become the starting point of a dialogue while focusing on creating something out of this conversation.

Both participants were asked to think of their ideas arising in connection with the quote and the visual material. They were free to add images of their own; however, these had to be related to fruits and vegetables. The title of the assignment was “Colors you can eat” (see *Figure 4-13*). The keywords and phrases used by the participants contained extensive lists of aspects pertaining to the visual material in their design work. In addition, they used stories and descriptions of experiences to explain their interaction with the collection of visual material.

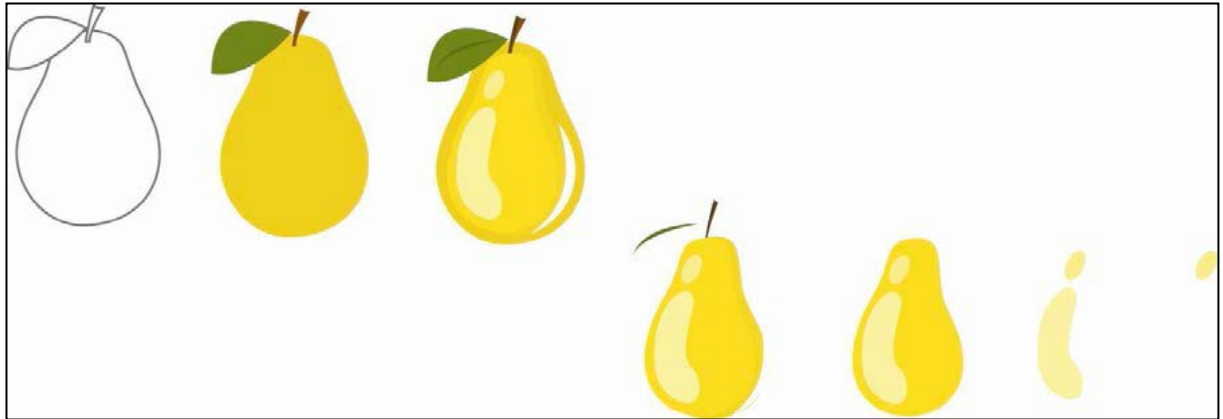


Figure 4-13. Tell your stories with colors that you can eat. An image participants were provided with at the start of the workshop.

Results: The participant (GE) explained her color concept for the fridge shown in *Figure 4-14*, as “elegant”, “dreamlike” and “luxurious” and added that “the peel of a pomegranate is the slight silhouette of the kernel, and the ripe crystal pulp is dreamlike – the fruit easily comes to life.”



Figure 4-14. Pomegranate –The new color. The rich pomegranate red makes the fridge elegant, dreamlike, and luxurious.

According to GE, her next concept (*Figure 4-15*) was “luscious”, “playful” and “sensual”; she also mentioned that this “juicy and happy” shade was also the color of the watermelon. It is one of nature's most eye-catching hues; it works well in many spaces. This new color is more nuanced and softer than pure red or magenta – it is a shade of pink that has grown up.



Figure 4-15. Watermelon – The new pink color. *This melon pink makes the fridge luscious, playful, and sensual.*

The second participant (SK) said “pictures from my travel provides a means of constructing my idea.” The photograph of the cocktail at Mumbai Airport led her to the path of the new color for the fridge. (Figure 4-16)



Figure 4-16. A cocktail at Mumbai airport lounge was the inspiration for the new color.

The third participant (AP) was asked to create colors for and from her own surroundings. She was from Calcutta and was studying in Ahmadabad. She took pictures of her own surroundings and created a color palette for the fridge. (see Figures 4-17, 4-18 and 4-19).



Figure 4-17. Calcutta – getting ready for Pooja.



Figure 4-18. Calcutta – celebrating Pooja.



Figure 4-19. Kutch – celebrating colors.

All three participants described their use of images as helpful; the images triggered associations and gave them a clear direction to follow in order to arrive at creative and original solutions.

4.6 Workshop 5: Design of Handles

The fifth workshop aimed to explore the visualization of a product form with and without a narrative, and whether the use of narrative initiates a novel product form. A real project was taken up within the design studio of an appliance company.

Workshop theme: Design a handle for the refrigerator that is novel.

Participants: Four designers participated in this workshop. Three were professional designers with 3-5 years of work experience and the fourth was a student doing an internship. They were all part of the in-house design studio of the appliance manufacturer.

Procedure 1: Two participants worked on the design of handles for a single-door refrigerator. Both participants searched for images for inspiration in generating ideas for the product form.

Results: When the visual imagery used as inspiration was weak, the concept generated was also weak (see *Figure 4-20*). The design direction was ambiguous, and the presentation did not have any inherent strength. During this phase of conceptualization, the participants were given no clues, images or any written brief. Both participants struggled to arrive at meaningful solutions. They had no clear direction and during the presentation they were unable to explicitly communicate their ideas.



Figure 4-20. Handle designs based on uninspiring imagery. Weak imagery led to more simple solutions.

Procedure 2: Two participants were instructed to take images from their surroundings and think of their connections to cultural identity when conceptualizing handles for refrigerators. The first participant was a Chinese industrial designer and the second participant was an Indian industrial design student in his final year of graduate study.

Result: In the process of designing handles for a two-door refrigerator, the two participants worked with clear imagery that inspired them, to deliver original concepts which surprised them (see *Figure 4-21*). They said that after deciding on the direction, their search became easier. The selected images helped them to organize and conceptualize the shape, pattern, motif, and color combination. The method encouraged the participants to phrase their process in a language of everyday experience. The participants were provided with both a set of keywords and a structure, which could be efficiently organized.

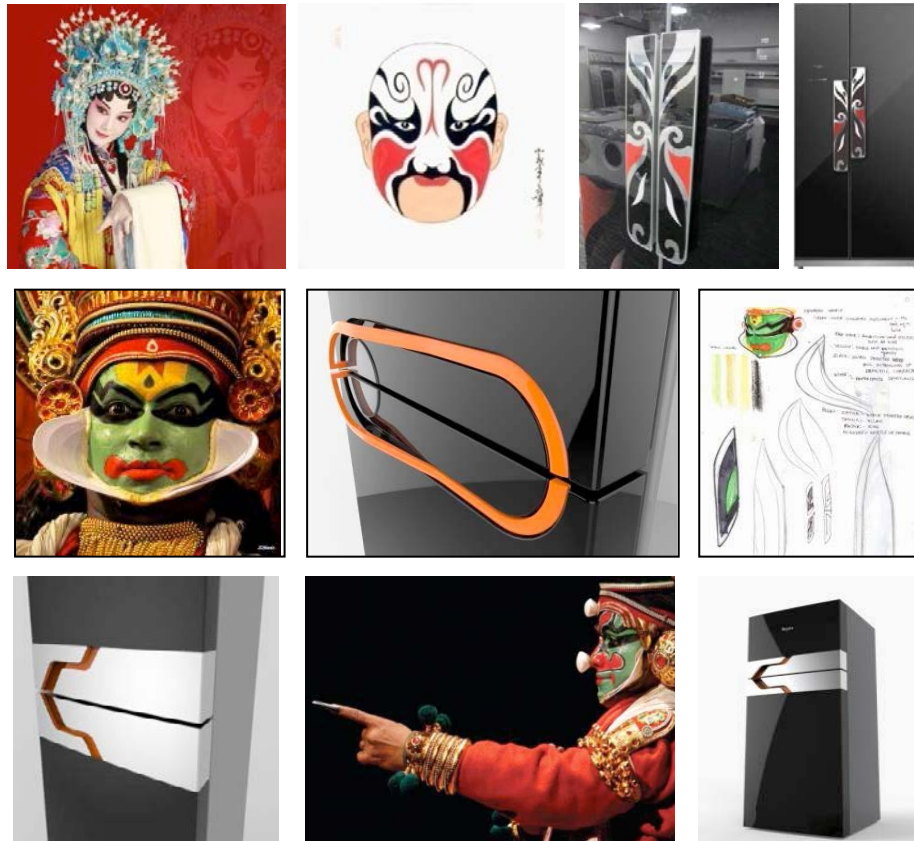


Figure 4-21. Handle designs based on designers' surroundings and cultural ties. *Stories from the designers' own lives can inspire original ideas.*

4.7 Workshop 6: Designing Home Appliances

This workshop aimed to do a comparative study to design a home appliance with and without a clear design brief, to investigate whether the use of narratives from personal experiences help designers come up with novel concepts. This study conducted in two different semesters in 2012 with Industrial design students in China.

Workshop Theme: Design home appliances based on a brief and/or personal experiences.

Participants: Thirty undergraduate and graduate industrial design students from the Tongji University, Shanghai, China participated in this study. Thirteen (43%) were female, and seventeen (57%) were male students. The age group was between 21 and 25 years, and the average age was 23 years.

Procedure: In the first semester the students had to investigate the emotional and personal quality of an experience – how ordinary things are shaped and used and how these things inhabit their owners’ lives. This became a possible starting point for design. The group working on a refrigerator was given a clear motto – ‘from your life – of your time’ – and the target users’ were 18-24 years old.

Results: The visual impressions gave meaning and contextual richness to the form language, which was essential in order to create an original product (see *Figure 4-22*). Design emerged from their everyday experiences, and the concepts were novel and youthful.



Figure 4-22. Refrigerator Ikea—make your own personal refrigerator. Inspired from a visit to Ikea.

In the second semester the exercise was to design a new washing machine. No brief was given, and the students were asked to produce concepts in groups. The resulting concepts were functional and mundane; there was very little storytelling, and the students did not seem excited about their output. (See *Figure 4-23*)

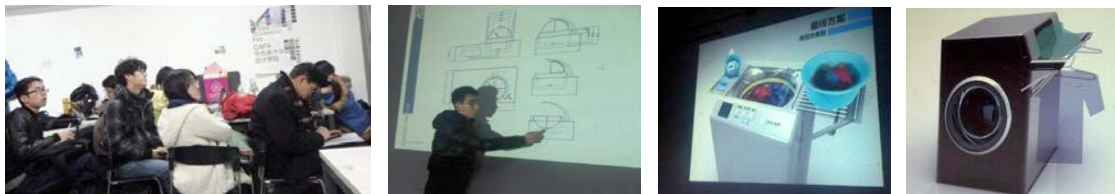


Figure 4-23. Washing machines designed without briefs. Concepts without stories resulted in functional appliances.

4.8 Workshop 7: Cool Boxes

How can we visualize form so that it will have some emotional meaning? In this experiment it was important to encourage the designers to leave their comfort zone and to draw the idea from their own experience rather than from marketing design briefs imposed on them. The focus was on developing each person's ability to look inside themselves in order to find their potential in rediscovering design. The main question was whether storytelling was a worthwhile tool for design students for creating product form and enhancing performance.

Workshop Theme: Create a novel form of a personal refrigerator. The project brief came from an established appliance manufacturer with well-defined constraints and context.

Participants: Eighteen third-grade undergraduate students studying industrial design at the National Design Institute, Ahmedabad, India, participated in this as part of their product design course.

Procedure: The study was to compare the design solutions of students using storytelling tools and students following traditional design processes. The project was performed in a design studio under the supervision of the faculty and the sponsor. The students were assessed on oral presentation, design sketches and their written reports. The method for collecting data on class work and the presentations was observation and the completion of rubrics.

At the end of each phase, a questionnaire was issued to each of the students who participated. The objective was simply to get responses to determine the effectiveness of storytelling tools from the students' perspective. Of the 18 participants, 18 (set1) and 16 (set 2) students completed the questionnaires. The two students who did not complete the second set of questions were not in class on the day it was issued.

Workshop Phase 1: Design solutions in response to a design brief – without narrative

In most companies, designers work to design briefs or product specifications that guide their designs. These include some visual and written directions about an initial product form that has been identified. It is then the designer's task to make these ideas a reality. In this early

stage of design, a designer must transform an informal, incomplete, and ambiguous specification into a high-level design expressed in drawings and sketches.

Results: Each student completed the design individually, and work was printed out in A3 size. Each student presented their concept (*Figure 4-24*) in the studio. The students also answered a questionnaire in which they were asked: “Was it easy to visualize the design of the refrigerator with the basic brief?” Fifty per cent said “no”, 33% “yes” and 17% had no opinion (See *Figure 4-25*).

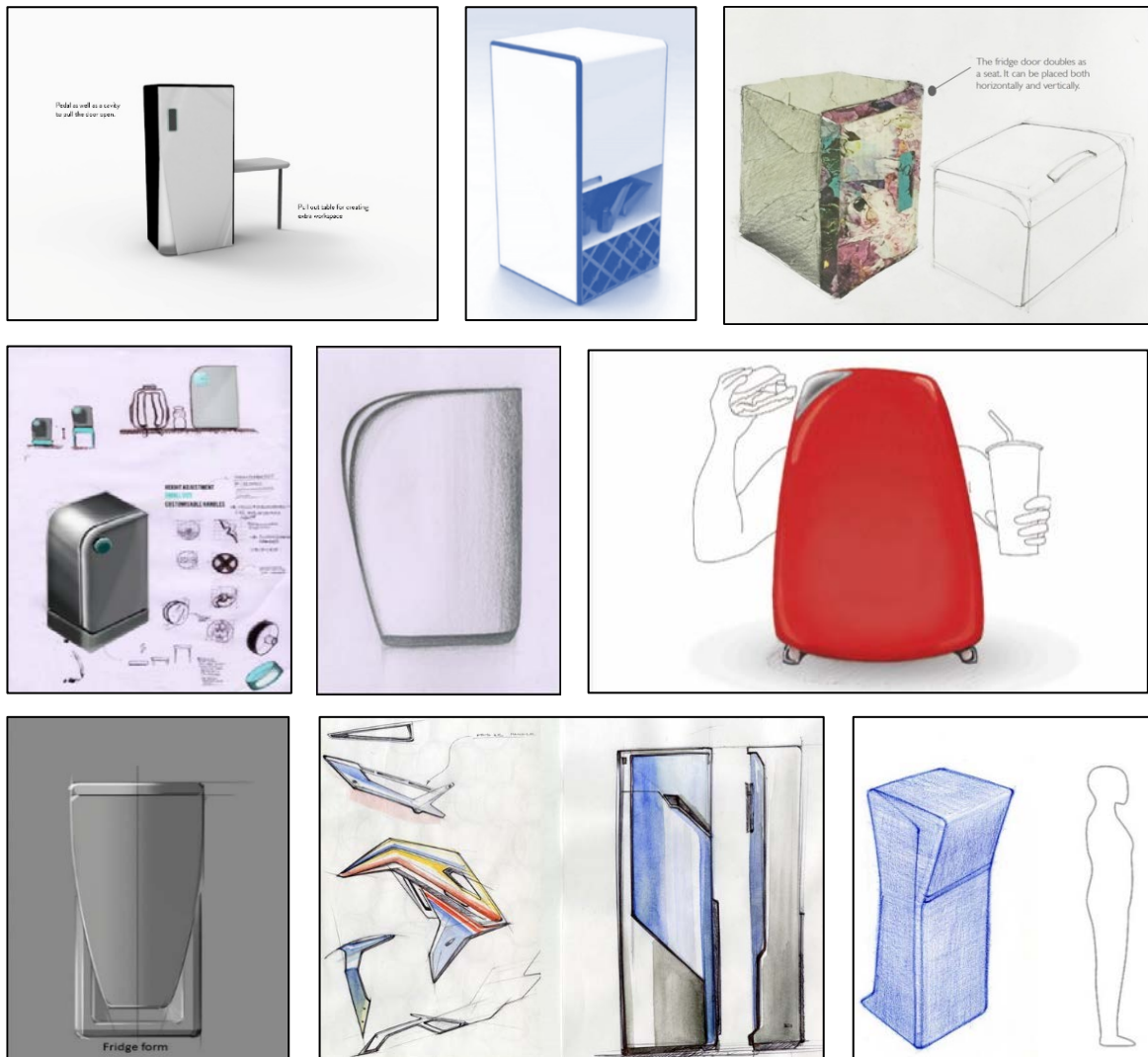


Figure 4-24. Refrigerator designs produced without a narrative.

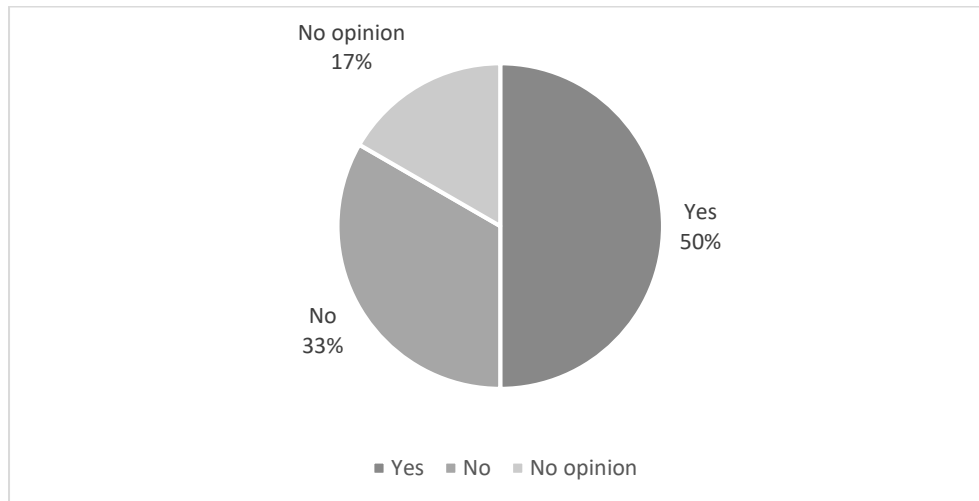


Figure 4-25. Phase 1 Survey questionnaire responses.

Workshop Phase 2: Design solutions in response to a design brief – using visual imagery/narrative/story

In design, words, images and shapes – in combination or independently – are used to communicate the concepts and represent the understanding of the physical world of artifacts. These are the most common media that designers use to interpret and reformulate design concepts. Stories and lived experiences are fundamental building blocks of design. “Stories capture the context, capture the emotions” (Norman, 1993, p. 130). The art of storytelling can be used to frame an idea and to create a concept.

Results: Each student completed the design individually, and work was printed out in A3 size. Each student presented their concept in the studio.

Aboli Joshi’s new refrigerator concept is a compact, bag-like, an appliance that can be slid below her bed to save space in a cramped hostel room. Her memory of the Star Wars book led to the color scheme and interactivity of the fridge (*Figure 4-26*) creating a sense of magic and wonder when approaching the food inside. It makes every meal an adventure.



Figure 4-26. Aboli's refrigerator design based on 'Star Wars' lightsaber.

Aparajita Tiwari's refrigerator came from her memory of her emotions when she got her first paycheck, "the passive excitement and the subtle feeling of achievement" is what led her to the new design. During her presentation, Aparajita said, "this elegant design is for people who like to lead, stay strong and never give up." (Figure 4-27).

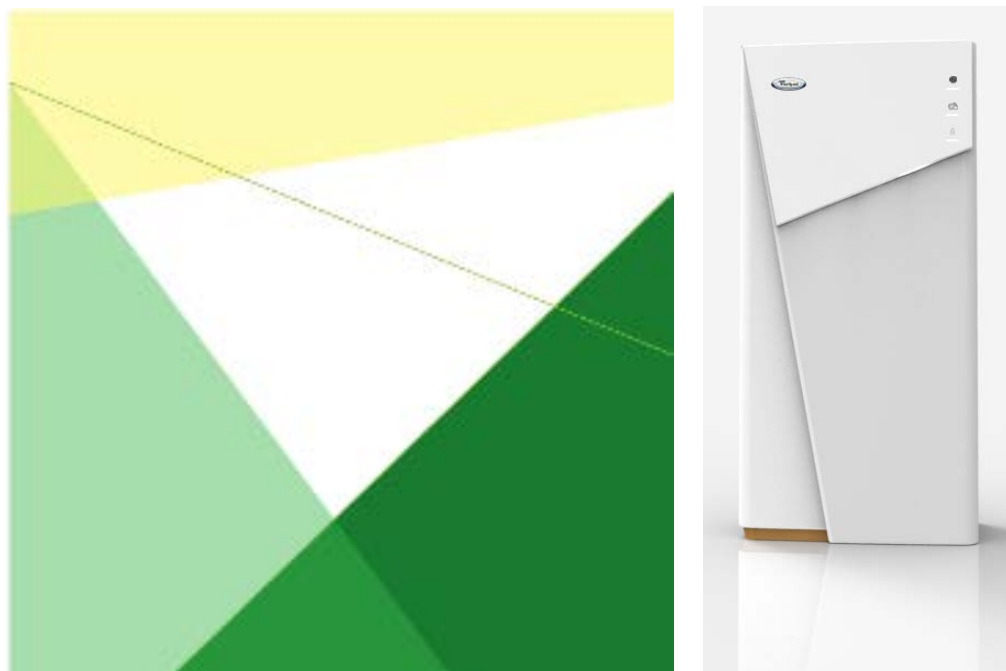


Figure 4-27. Aparajita's design resonates with her emotions, her confidence.

Atin Bose based his design on memory regarding an incident that took place on the road with some boys, the circle represents the juvenile and frolic nature of young blood. As orange-red is the color of the youth; it has been used with overlapping grey circles to create a sense of friction (Figure 4-28).



Figure 4-28. Refrigerator design based on the narrative of young energy.

Eating at midnight on the first night at the dorm, when it was not allowed and the matron sleeping just next door, opening the refrigerator was an act of defiance for Deerga Joshi. And it came with its own “nervous excitement.” The memory of the band of light at the bottom of the dorm door became the element around the new refrigerator door handle. (Figure 4-29).

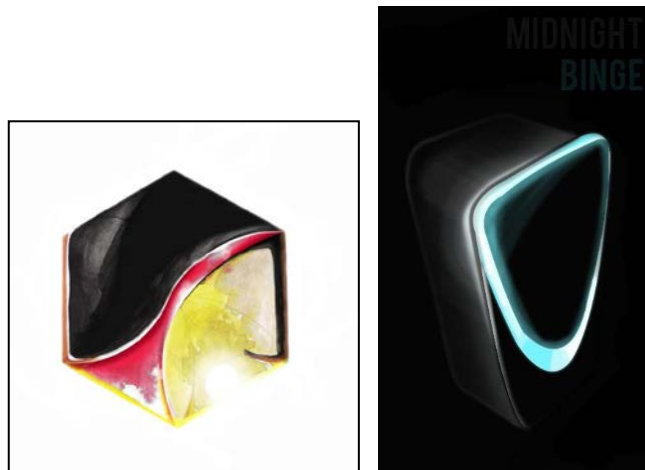


Figure 4-29. Fridge design based on the narrative of a night binge.

For Jayneel who missed the serenity of sitting on a rock near the river in his hometown, the design evokes and makes him relive the experience. His narrative script designs the product form. The soft contours, like the stones and boulders, on the river bed – became the dominating character of the personal refrigerator (Figure 4-30)

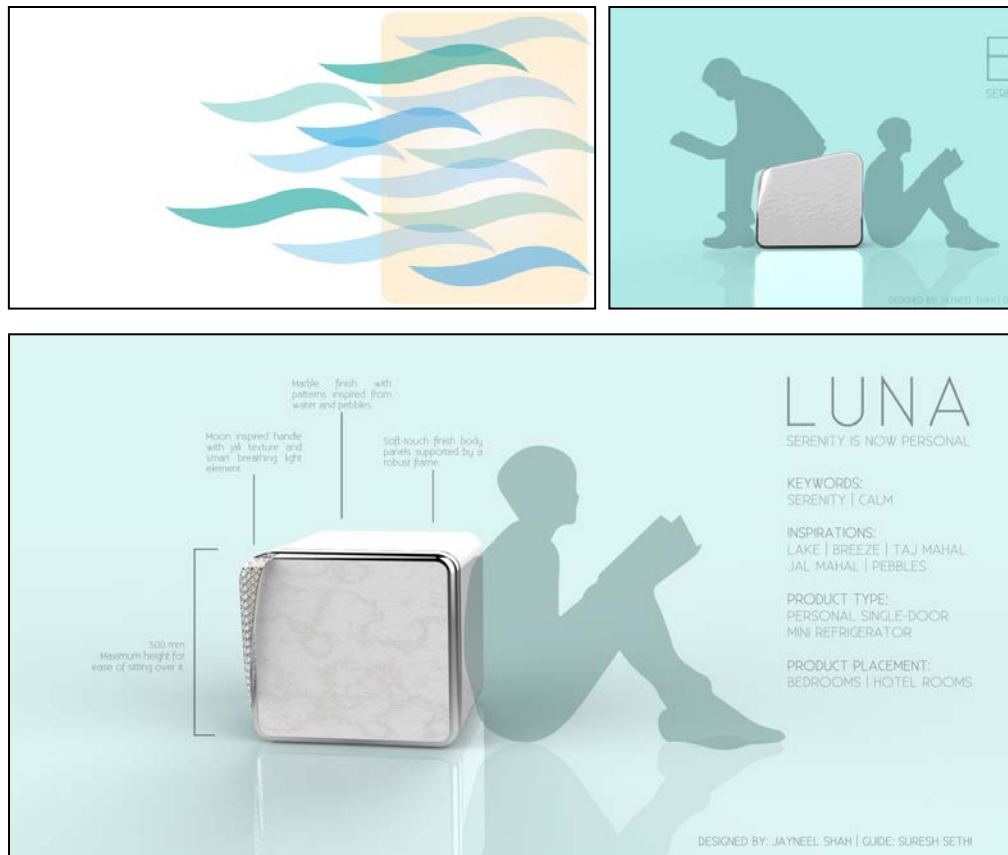


Figure 4-30. Serene – as dominating quality.

Gaurika Singhal's recollection of rollercoaster ride, beautifully illustrated, however did not yield a result to her satisfaction. (Figure 4-31)

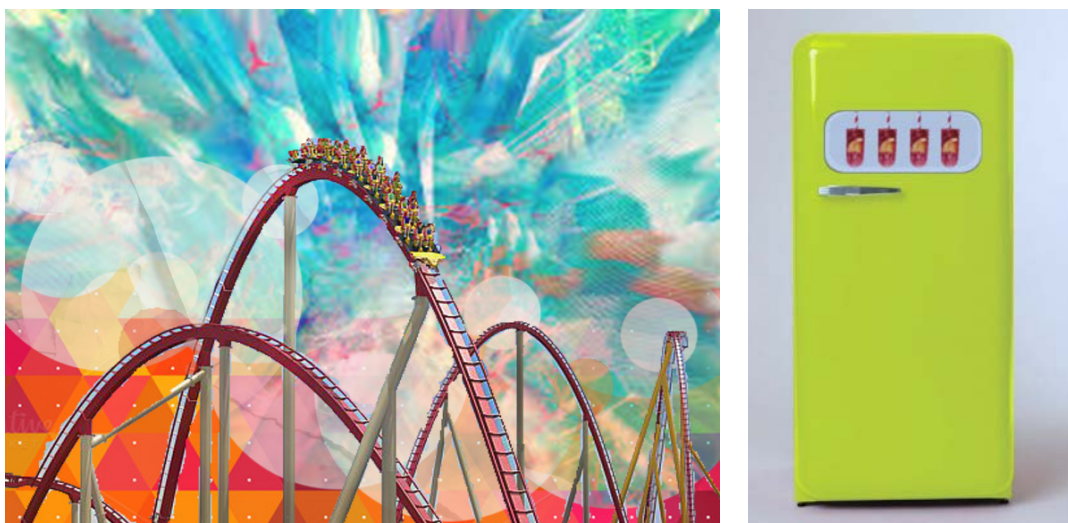


Figure 4-31. Refrigerator with a transparent ice-candy making chamber. A reminding of her trip to the amusement park.

The stored events that led her to the elegant design made sense only when one comprehends the larger picture. Far from constituting fixed snapshots of past events, memories are representations that change over time, enhanced by the imagination revised in the light of more recent experiences. Kamana Marwah's design reflects the lightness and joy of the rollercoaster illustration that she saw in the class presentation. (Figure 4-32)



Figure 4-32. Colors of the refrigerator design are like the colors of ice cream candies.

The students also answered a questionnaire in which they were asked: “In the second part of the exercise, your design started with a personal story/experience of an incident. Does this process improve the efficiency of the ideation/originality of the final solution?” Sixty nine per cent said “yes”, 12% “no” and 19% had no opinion (Figure 4-33).

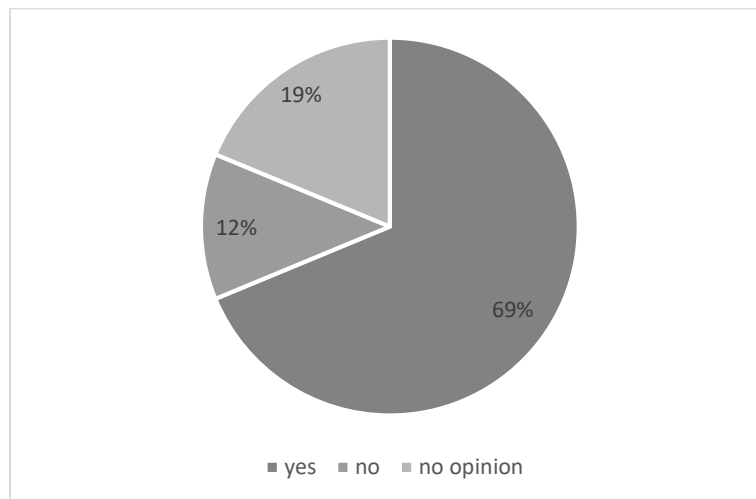


Figure 4-33. Phase 2 Survey Questionnaire Responses.

All participants received grades for their design concepts at the end of the course. The students took their work very seriously, as this was an industry-sponsored project which

also gave them the freedom to do as they wished to. By the end of the module, most of the students (11 out of 16) found that narratives were very useful to visualize product form in a meaningful way. (For comparative results of the two phases of workshops see Figure 4-34) The students also regarded the narrative as a very positive way to go about their work. Most students said it “was a new way to visualize” and “it gave us a tool to create and communicate clearly.” All students expressed an interest in exploring this way of designing and to further investigate the narrative approach. Most students also suggested they would use stories again when developing their concepts as they felt it helped build their confidence.

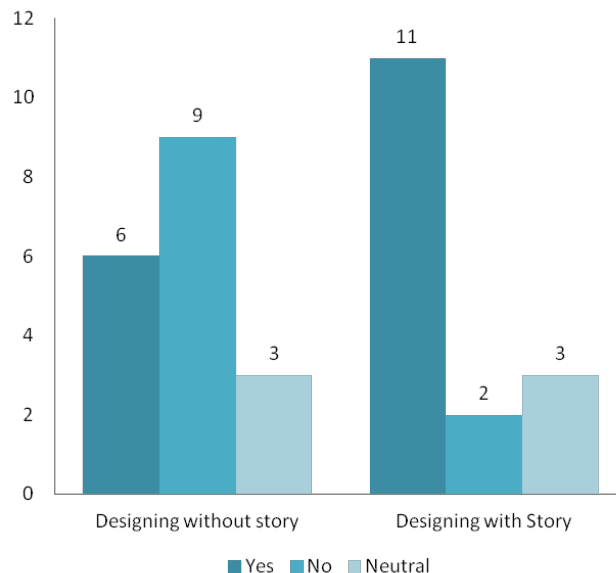


Figure 4-34. Comparative results with and without narrative.

4.9 Summary of Workshop Findings

The workshops became a laboratory for exploring the role of the narrative method in generating product form. The following findings have been confirmed during the different phases of the research:

- For the students, every new design is a risk, as it brings the possibility of failure. When asked to describe their methods of inquiry, they speak of experience, trial and error, and intuition.

- Using narratives gave them the freedom to pursue their own sense-making goals to formalize the character and elements of the form. Emergence of coherent information from a narrative became the guiding principle which created a meaningful and integrated form.
- The students found that the narrative was a very positive way for them to go about their work. Most students said it “was a new way to visualize” and “it gave us a tool to create and communicate clearly.”
- Narratives helped the participants in planning and navigating the process, as well as in decision making. Thanks to narratives, they discovered that design was not set apart from daily life but sprang forth from visual impressions of our experiences.
- All students expressed an interest in exploring this way of designing, and to further investigate the narrative approach. Most students also suggested they would use narratives again when developing their concepts as they felt it helped build their confidence.
- Narratives give the designer a pair of wings to transcend limitation and do original work.

These findings have clear implications for design education: teaching designers to use storytelling as part of their concept generation, especially in the early stages of design when concepts are ambiguous, has the potential of producing new interpretations. “When designers are producing drawings entirely for their own benefit as opposed to presenting information to others, this reflective process is almost the whole part of the drawing. It is these design drawings, sketches, scribbles, diagrams and the like that most offer this conversational potential” (Lawson, 2006, pp. 278-79). To start with, designers only see the thing in their mind, and then they start making simple sketches and organizing things, and then they start making layers after layers. Such a drawing is done by the designer not to communicate with others but rather as part of the very thinking process enabling to visualize product form. The process that starts with ambiguity and anxiety also makes the designer wonder. Moreover, when the solutions are made visible, it is sheer surprise and astonishment.

Chapter 5 Evaluation and analysis

5.1 Aesthetic Assessment

This research aims to prove that the fact that product form visualized with the help of personal narrative is aesthetically more appealing than the designs that came out of a functional brief without any personal narrative. The narrative seems to be the condition that guarantees the unity of the object and, at the same time, gives the object its structure by connecting and merging lines, colors, shapes, and volumes of the experience into a new form. This merging is what philosopher John Dewey called aesthetic experience. Aesthetic experience has a central focus, in which attention is upon its object, intensity, and unity, where unity is a matter of coherence and completeness (Beardsley, 1958). The analysis of the results focuses on the judgment of form aesthetics to evaluate the narrative treatment in visualizing product form.

To investigate the value of the proposed three-step design framework, the so-called “research through design approach” was adopted. This approach focuses on embodying emotion and personality in product appearance and it was put forward by (Norman D. A., 2004) (Desmet, Ortiz Nicolas, & Schoormans, 2008). During the workshops, different sets of products were designed with the aim of visualizing the form with and without narrative (see Chapter 4). The subsequent part of the research focuses on the evaluation of these sets of stimuli.

5.2 Hypothesis

This study rests on the assumption that narratives help the design process result in more desirable product forms. Therefore, one hypothesis is that the product form visualized with the use of narratives is preferred to the ones designed without narratives, regarding aesthetic appearance, to which unity – coherence and completeness – is essential.

Hypothesis 1 (H1): The use of narrative enhances the efficacy of visualizing the product form, compared to product forms visualized without a narrative.

Secondly, the stimuli for product form – conceptual sketches and drawings – had to be assessed. We also related these to the use of narratives, and we wanted to investigate how and to what extent users perceive the narrative in the product form. To this end, we formulated a second hypothesis.

Hypothesis 2 (H2): The sketches of the stimuli with narratives are better than the sketches without narratives.

Lastly, we wanted to prove that product appearance plays a significant role in user preference, as generally products that produce positive aesthetic impressions are preferred.

Hypothesis 3 (H3): The stimuli with narratives are preferred to the ones without narratives

5.3 Designing an Assessment Scale

The systematic aesthetic evaluation of the product form generated with narratives has several stages. The first step is to define what is to be measured. In this assessment, we are interested in what the object looks like, focusing on what the form of the object “appears or feels.” In this aesthetic assessment, besides evaluating the designed object (the logical outcome of the process), the research also intends to find out if the use of narrative creates a positive effect regarding the expressive qualities and the unity of the designed artifacts.

In this study, the definition of aesthetics is the “essence” of the narrative or the “feel” of the object at first glance. Dewey also noted that “essence” could also mean the indispensable “gist” of a thing. All artistic expression moves towards the organization of meaning in a way that captures essence in this sense. According to Dewey, there are no standards for critical judgment, but there are criteria of judgment. These criteria are not rules but rather means of discovering the aesthetic dimension of product form (Leddy, 2016). When people look at objects, the objects are experienced sensually, objectified rationally and realized as a synthesis. They use language to express their feelings whether the object was pleasing or not. Dewey proposed that language provided a way of sorting out our thoughts about the world.

As the aesthetic point of design is communicated through the precise use of language, we started with investigating what terms and words designers use when defining the aesthetics of a product. “The development of the product personality scale followed the general steps of the scale development. First we formulated a definition of product personality and established its defining components. Then the format of measurement was determined and an initial item pool was generated. Next, this item pool was reviewed with respect to defining components of product personality, and reduced to manageable number. A final stage in the development concerned” (Govers, 2004, p. 165). Although the current study mainly followed the stages described by Govers, the main focus was not on the personality of the product, but more on the unity of the product form and on whether the linguistic approach can help us assess the aesthetic appeal of a product.

5.3.1 Format of measurement

Designers more or less consciously strive to create a coherent unity of three factors – “instrumental”, “affective” and “preference.” Each of the three applies to different functions and qualities of the artifact. Narratives not only facilitate the right kind of cues in the visualization of the product form, but also help in communication. Moreover, the narrative is the key to a coherent design or an integrated matrix within which one can make sense of the visualized form (Worth, 2004). The “essence” or the “emotion” of the narrative is communicated with adjectives. Although, on a practical level, researchers could settle for using only one emotion, by choosing more than one item we can capture the full construct

of the aesthetic assessment of a product form (Blijlevens, et al., 2017). Therefore, the three-factor model would be an appropriate way to assess the completeness and coherence of the visualized form as well as the effectiveness of the narrative to create the product form.

We decided to use adjective pairs representing two opposites (e.g. strong – weak) as “aesthetic impression may be defined as the sensation that results from the perception of attractiveness (or unattractiveness) in products” (Crilly , Moultrie, & Clarkson, 2004). In the creation of a product form, there are different theories regarding contrast, light and dark, and dominant and subordinate qualities. According to Kostellow (1947), “balance, not the symmetrical equalization of weight or median lines, but the dynamic distribution of it to achieve livingness; tension, the awareness of the drama of existing relationships in space between widely separated parts; integration of positive and negative volumes...; opposition, the forceful relationship of the heterogeneous elements in the design structure” (Hannah, 2002, p. 27) are all essential in the perception of the product form.

Johannes Itten, the famous instructor of the Bauhaus school, was in favor of teaching students about contrast. “Light and dark, material and texture studies, form and color theory, rhythm and expressive forms were discussed and presented in their contrasting effects. Finding and enumerating the various possibilities of contrast was the most exciting lessons, because the students realized that a whole new world was opening up for them... The students had to study the contrasts in three ways: to experience sensuously, to objectify rationally, to realize as synthesis” (Itten, 1967, p. 17). For Itten, this opposition was one of the most expressive and vital means of design, as the gradation between the poles of contrast contains life, and serves as an emotional quality, that is, the essence of the product form.

5.3.2 Aesthetic terms and product form

Study 1: Aesthetic terms from students

In the first study of discovering the aesthetic terms and adjectives to assess the aesthetics of the designed object, we set off to find out how design students communicate aesthetics of the designed artifact and what words they use to define the artifact they are currently developing or about to buy.

Participants: We recruited thirty design students from School of Art + Design at the University of Illinois at Urbana-Champaign. Twenty-one of them were female (70%), and nine were men (30%). The participants’ age ranged from 21 to 27 years, with an average age of 23 years. The participants were all majoring in industrial design.

Procedure: The instructions asked the participants to write down twenty words that they use in their everyday work when describing a product form.

Results: Five students repeated only fourteen words (*Figure 5-1*) out of the 504 words mentioned. Twelve students had “simple” on their list. Eleven students listed “functional.” Ten students listed “innovative” and eight mentioned “aesthetic.” “Modern” and “sustainable” were mentioned by seven, “unique,” “elegant,” “dynamic,” “ergonomic,” and “minimal” by six students each. “Fashion,” “durable,” and “smart” were listed just by five (for the complete list, see *Appendix A*).

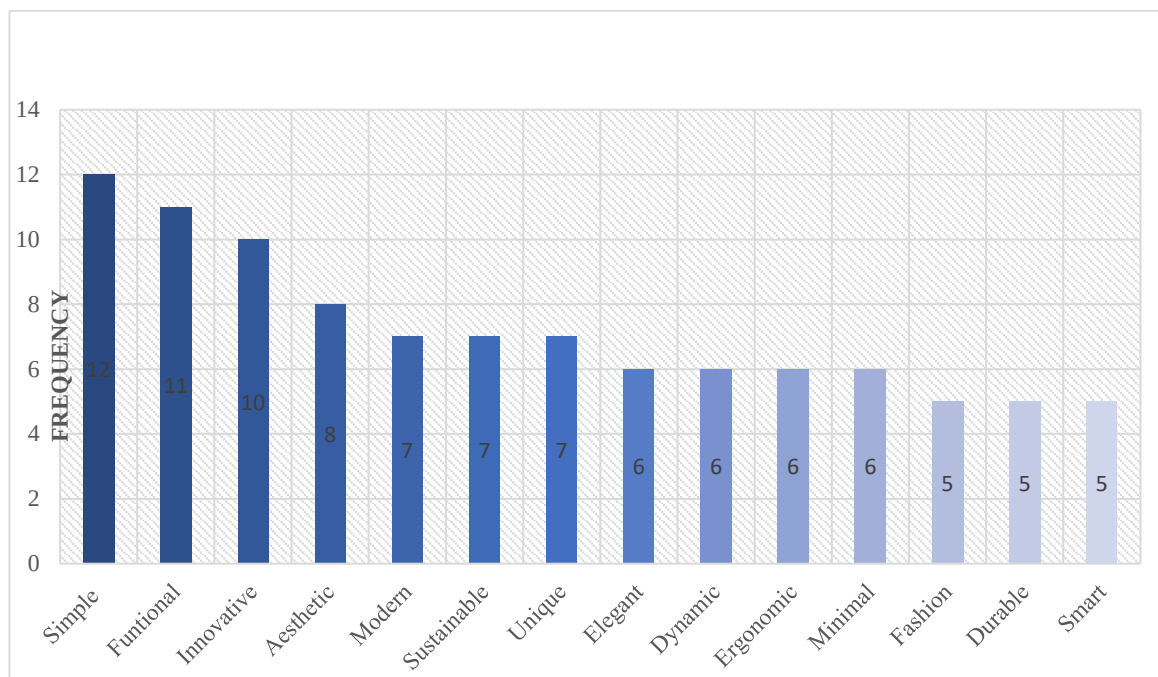


Figure 5-1. Frequency of listing aesthetic terms for product form by design students.

Study 2: Aesthetic terms from literature and previous studies

In this study, I researched how philosophers approach aesthetics, and how their approach uncovers the richness and range of language applied to the everyday world, including artifacts such as cars and furniture. Sibley, for instance, noticed that our application of particular concepts might differ depending on what we are talking about. So, for example, we are unlikely to say that a sunset is “good,” we would most likely say that it is “wonderful.” Sibley proposed a list of what he called “aesthetic concepts,” among which “we find the following: unified, balanced, integrated, lifeless, serene, somber, dynamic, powerful, vivid, delicate, moving, trite, sentimental, tragic, graceful, delicate, dainty, handsome, comely, elegant, garish, dumpy, and beautiful” (Sibley, *Aesthetic Concepts*, 1959, p. 421).

We looked at the current research in design to observe how language is used to study product personality and how the user respond emotionally. When developing their product personality scale, Mugge, Govers and Schoormans compiled an exhaustive list of 1142 words, which they subsequently reduced to 78. From these 78 words, a set of 20 words was finalized, and they developed lexical descriptions for them. The set includes words like dominant (overpowering), boring (monotonous), easygoing (informal), pretty (attractive, charming) and idiosyncratic (unusual, out of the ordinary) (Mugge, Govers, & Schoormans, 2009)

According to Desmet (2003), emotional responses that products may elicit can be categorized into the following five classes: instrumental, aesthetic, social, surprise and interest. Both Desmet (2003) and Crilly (2004) agree that the perception of novelty in design is mostly driven by surprise (charming) and idiosyncrasy (unusual, out of the ordinary). When developing a scale to measure aesthetic pleasure for designed artifacts, Blijlevens et al. have found 86 words after extensive literature research, including “clear, dynamic, varied, powerful, beautiful, distinctive, moved, and novel” (Blijlevens, et al., 2017).

Study 3: Shortlisting the relevant terms

Participants: Two experts in design – one male and one female employee of the School of Art + Design – participated voluntarily. One had professional background in industrial design, the other in interaction design.

Procedure: The instruction was to confirm aesthetic terms and words that were all present on Sibley’s, Gover’s and Blijlevens’s lists, as well as on the list compiled by the students in Study1.

Results: Twenty-four aesthetic terms were shortlisted (see Table 5-1).

Table 5-1

List of twenty-four terms shortlisted by the two participants

beautiful	balanced	dainty
delicate	dynamic	elegant
strong	surprising	somber
serene	sentimental	integrated
graceful	unified	vivid
tragic	moving	garish
trite	lifeless	handsome
powerful	varied	novel

Study 4: Selection of aesthetic terms used to describe product form

This study aimed to explore which words are most commonly chosen by the students when describing the aesthetics of a product form. The selection procedure involved three groups of participants who were given a list of the twenty-four shortlisted words.

Participants: Fifty-seven students from School of Art + Design at the University of Illinois at Urbana-Champaign participated voluntarily. There were nine students from the industrial design MFA program, twelve junior students majoring in graphic design and thirty-six senior students from the industrial design BFA program.

Procedure: Each participant was given the list of twenty-four words shortlisted by the two professionals in the previous phase of the study (Table 5-1). Three different sets by changing the order of words were made and randomly assigned. Each participant was asked to choose five words from the list to answer the following question: “When you buy a product, what would you like the product to be?” They were also asked if they looked for novelty or any differentiation in a product they were about to buy. For the complete list of the words, see Appendix B.

Results: Overall, five aesthetic adjectives (dimensions) were identified for assessing the aesthetics of the product form (see Table 5-2). When answering the second question, most students agreed that they wanted a novel and differentiated product.

Table 5-2
List of the five terms shortlisted by design students

Delicate	Strong	Dynamic	Surprising	Elegant
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Table 5-3
Steps of shortlisting aesthetic dimensions

Words listed to describe the aesthetics of product form	
Study 1: Industrial design students (n=30) list 20 words they use to describe designed artifacts.	Simple, functional, innovative, aesthetic, modern, sustainable, unique, elegant, dynamic, ergonomic, minimal, fashion, durable and smart were the only words repeated more than five times (for the complete list, see Appendix A).
Study 2: Literature Search:	Sibley’s approach to aesthetics uncovers the richness and range of language applied to the everyday world. According to Sibley, aesthetic terms come in an almost endless variety and span a great range of types and sub-types (Sibley, Aesthetic Concepts, 1959)
1. Sibley’s aesthetic concepts	
2. Mugge, Govers and Schoormans’s product personality scale (2009)	The original list of 1142 words was subsequently reduced to 78. From these 78 words, a manageable set of 20 words was finalized, and lexical description of the words was developed.
3. Ortiz Nicolas (2014)	Ortiz Nicolas came up with a set of twenty-five positive emotions including ones which are highly-preferred by designers: e.g. curiosity, joy, confidence, inspiration, fascination, and pride.
4. Blijlevens et al. (2017)	Blijlevens et al. found 86 words based on extensive literature reresearch that include “clear, dynamic, varied, powerful, beautiful, distinctive, moved and novel.”
5. Expert Shortlisting	Two experts helped in creating a list of 24 words that were found most appropriate for the current research.
Study 3: Industrial design students (n=57) list five words from the 24 words shortlisted by the experts. (Appendix B)	The shortlist compiled by the experts was reduced to five words. This list was discussed with the experts again to get the final list of nine words relevant to the current research.

5.3.3 Selection of aesthetic terms to form the concept scale

The primary aim of the study was to select aesthetic dimensions that show a particular pattern of relationships, to indicate the existence of a coherent unity of the three factors – instrumental, affective and preference. During a second discussion with the two experts, the words “varied,” “formal,” “clean” and “desire” were added to the list of five words (see Table 5-4). The experts agreed that these dimensions were meaningful when making a value judgment on a product form.

Table 5-4

List of nine terms shortlisted for the three-factor model for aesthetic assessment

Clean	Delicate	Desire
Dynamic	Elegant	Formal
Strong	Surprising	Varied

As mentioned previously (see Section 5.3.1), it was decided that the format of measurement would make use of adjective pairs representing the nine dimensions. Table 5-5 depicts the final list of the nine pairs of opposites.

Table 5-5

List of the nine pairs of opposites

Clean - Messy	Delicate - Rough	Desire - Disgust
Dynamic - Static	Elegant - Not elegant	Formal - Casual
Strong - Weak	Surprising - Boring	Varied - Monotonous

These dimensions were then used to describe the product form visualized with narratives. The artifacts for this study were selected from the pool of items collected from practitioners during the fieldwork of this research (see Chapter 3).

Participants: We recruited thirty design students from School of Art + Design at the University of Illinois. Twenty of them were female (67%), and ten were men (33%). The age of the participants ranged from 21 to 28 years, with an average age of 24 years. The preference for recruiting only design students was because their training in the ability of

color, line and three-dimensional volumes/spaces, and also to notice or discern expressiveness and unity in an object.

Questionnaire: Each participant received a set of questions (*Figure 5-2*), which was based on the adjective pairs for each aesthetic dimension (see Appendix C for the complete set).

	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

Figure 5-2. Aesthetic dimensions.

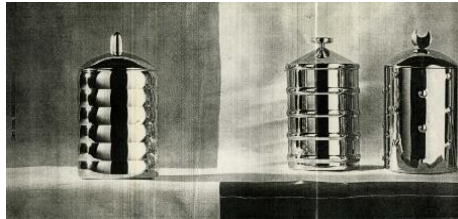
The set was compiled for rating based on each of the nine dimensions for nine artifacts. The photograph and the narrative of each artifact were individually illustrated. These nine artifacts were selected by the two experts from the pool of 81 artifacts collected during the fieldwork. Three versions of the questionnaire were made in a randomized order.

Procedure: Before the participants got started, test procedures were explained, the narratives were read aloud, and high-resolution color images of the artifacts were projected on the screen. Each participant completed the test individually and rated nine products based on each pair of the quality dimensions. These products and narratives are illustrated in *Figure 5-3*.

Artifact	Narrative
	1. Designed by Giovanni Levanti for Campeggi, “Sneaker” is a home-gym. It is a functional piece of furniture that can be placed in any room of your home.
	2. The lucky pine cone of Sicily led to the moneybox “Soldino”, produced in 2010.
	3. “When I designed the first ‘Cooler with Wheels,’ I reflected back to my childhood, having a red wagon.” Jim Costello
	4. Mabkhara is the traditional Arab incense burner, an authentic object in daily domestic use in the Arab world. Constantin’s time at Doha is reflected in these beautiful glass pieces.
	5. Francesco Binfare’s love for Africa and his frustration of not being able to talk to someone sitting next to him led him to design this table.
	6. “I designed ‘Lepsis’ as a solution to environmentally hazardous meat production and world hunger, but the design process that led to this product was a personal journey down memory lane. As a child growing up in the West African nation of Togo, I used to eat grasshoppers and flying ants as a cultural ritual and a source of protein.” Mansour Ourasanah



7. Ettore Sottsass's natural way of documenting his journey yielded simple sketches that, in this case, helped clarify the design theme for his project. A designer's mind will process rich observations, narratives from her/his life experiences and crystallize these into design directions.



8. Clare Brass designed these containers for Alessi. The inspiration for her design came from the images and objects she came across during her travels in India.



9. When developing this concept, Starck was doing what many designers do, which is to draw upon a repertoire of precedents, of remembered images and recollections of other objects that helped him give a more coherent, practical and attractive form to the concept (Cross, 2011).

Figure 5-3. Artifacts pool from practitioners.

Results: The study was set up to test the reliability of the aesthetic assessment scale. Most importantly, the main focus was on the role of narratives in generating the product form. The scale could be considered reliable if the dimensions of each stimulus were to be perceived consistently by the thirty participants, who assessed the nine dimensions allocated to each artifact collected during fieldwork. The mean scores of the product dimensions are depicted in Table 5-6. The results show high reliability values for all nine stimuli. The alphas are all high (0.79 – 0.88), and the r_1 values are all significant. These results indicate that the product dimension profiles of all stimuli were perceived consistently by the participants.

Table 5-6

Reliability of the scale calculated for each artifact variant (n=30)

Artifacts from fieldwork	α	r_1
Artifact 1	0.79	0.30
Artifact 2	0.84	0.36
Artifact 3	0.88	0.47
Artifact 4	0.84	0.38
Artifact 5	0.85	0.41
Artifact 6	0.79	0.30
Artifact 7	0.81	0.33
Artifact 8	0.87	0.42
Artifact 9	0.79	0.34

Reliability of individual dimensions

The scale also needed to provide a consistent result for every dimension to be reliable. The results are depicted in Table 12. The results show high reliability values for all items.

Table 5-7

Mean scores on the product dimensions of nine artifacts (n=30)

Dimension	M ₁	SD ₁	M ₂	SD ₂	M ₃	SD ₃	M ₄	SD ₄	M ₅	SD ₅	M ₆	SD ₆	M ₇	SD ₇	M ₈	SD ₈	M ₉	SD ₉
Strong	3.7	0.78	3.6	0.85	3.8	0.79	4.0	0.81	4.0	0.95	4.0	0.56	3.4	0.86	3.7	0.88	4.1	0.78
Dynamic	3.8	0.90	3.3	1.09	3.4	0.77	4.0	0.74	3.9	1.09	4.3	0.74	2.9	1.01	3.3	1.06	4.3	1.09
Elegant	3.2	0.97	4.2	0.65	3.1	1.03	4.3	0.74	3.2	0.86	3.7	0.92	3.8	0.90	3.8	0.96	4.3	0.79
Delicate	2.9	0.80	4.1	0.74	2.9	1.12	4.5	0.63	2.5	1.07	3.9	0.82	3.7	0.76	3.7	0.92	4.2	0.73
Varied	3.6	0.94	3.3	0.84	2.8	0.76	4.0	0.72	3.9	0.80	4.1	0.74	3.2	0.70	3.0	0.81	3.9	0.96
Surprising	3.8	1.14	3.5	0.94	3.0	0.81	4.0	0.81	3.9	0.94	4.5	0.63	2.9	0.97	3.3	0.95	4.5	0.73
Formal	2.7	1.05	3.5	0.90	2.9	1.08	3.9	0.80	2.8	0.99	3.2	0.83	3.4	0.97	3.7	0.76	3.8	1.16
Clean	4.1	0.84	4.5	0.51	3.8	0.85	4.1	0.98	3.2	1.10	3.7	0.87	3.9	0.82	4.3	0.74	4.4	0.77
Desire	3.6	1.03	3.9	1.36	3.5	0.82	4.1	0.78	3.6	0.90	3.4	1.01	3.2	0.61	3.6	0.89	4.1	0.97

5.3.4 Concept scale

The aesthetic assessment scale consists of adjectives which could be interpreted differently by each participant. It is also clear that these nine dimensions, which may not be present in all the products, influence the product form through their particular arrangement. One way to create a scale to address these values would be to broadly group them into three sub-groups – instrumental, affective and preference. These sub-groups are at a higher level of abstraction than piecemeal dimensions and therefore allow for a holistic judgment.

Instrumental – utilitarian/functional – Is the design grasped as a general whole; is it complete and coherent? Is the representation of the narrative strong? Is the articulation of the visual sketch and drawings clean and formal? Do the instrumental components - formal, strong, clean - describe the quantitative, measurable aspects of the designed product form.

Affective/Expressive – emotional – Is the solution (the product form) elegant /delicate /dynamic /varied /surprising? What are its regional qualities and how intense are they? According to Beardsley (1958), an aesthetic object has certain obvious and emphatic features – its dominant patterns or qualities – that stand out clearly and can be perceived without much effort. “The features which make something delicate or graceful, and so on, are combined peculiarly and uniquely; the aesthetic quality depends upon exactly this individual or unique combination of just these specific colors and shapes so that even a slight change might make all the difference” (Sibley, *Aesthetic Concepts*, 1959, pp. 434-35)

Preference – Is the product likely to be purchased? The deliberate choice of making a preference relies on understanding the design attributes of both Instrumental and Affective, and of how the elements of color, material, volume, texture, patterns etc. come together coherently to evoke the intended aesthetic experience. An ideal choice of object is both sufficient (functionally) and satisfying (emotionally / experimentally).

All three qualities are considered when making a value judgment on a design regarding its coherence. To what degree is the design coherent with the subject? Coherence is a matter of having elements appropriately connected to one another, and an orderly accumulation of

energy towards a climax should be present to an unusual degree (Beardsley, 1958). The concept scale is depicted in Table 5-8.

Table 5-8
The three-factor aesthetic assessment scale

3-Factor Model	Dimensions	Evaluation
INSTRUMENTAL	- strong - weak - clean - messy - formal - casual	- How well does the narrative work in creating the product form? - Is the narrative clearly translated into visual form? - Is the output strong regarding visualized drawings and product form?
AFFECTIVE	- elegant - not elegant - dynamic - static - delicate - rough - varied - monotonous - surprising - boring	- Is the product form elegant/delicate/dynamic/varied/ /surprising? - An aesthetic object has a specific dominant quality that we are likely to notice. Is such a quality present? - What are its regional qualities and how intense are they? Are they balanced?
PREFERENCE	desire - disgust	- To what degree does the design cohere with the subject? - Is the design complete and coherent?

5.3.5 Testing the three-factor scale.

The final step in scale development is testing the concept scale concerning validity and reliability. A primary test of this has already been reported in Section 5.3.3. The result showed that the selected scale provided reliable result. The aesthetic dimensions have been grouped together around three factors, and the following questions needed to be answered:

- Are objects designed with narratives perceived as complete and coherent?
- Is the product elegant? Do the participants prefer products that are elegant?
- Does the reputation of the designer affect preference?

Are artifacts designed with narratives perceived complete and coherent?

Is the narrative clearly translated into visual form? Is the output strong regarding visualized drawings and product form? Is the design complete and coherent? Coherence is promoted by focus, balance and equilibrium, as well as by the similarities between the parts of the

design. If the narrative process was meaningful, there should be a degree of agreement between the participants about the instrumental dimensions of a particular artifact, even though they had rated the product independently. The outcome of the test (*Figure 5-4*) gave strong support to the idea that participants found that the artifacts designed with narratives were meaningful.

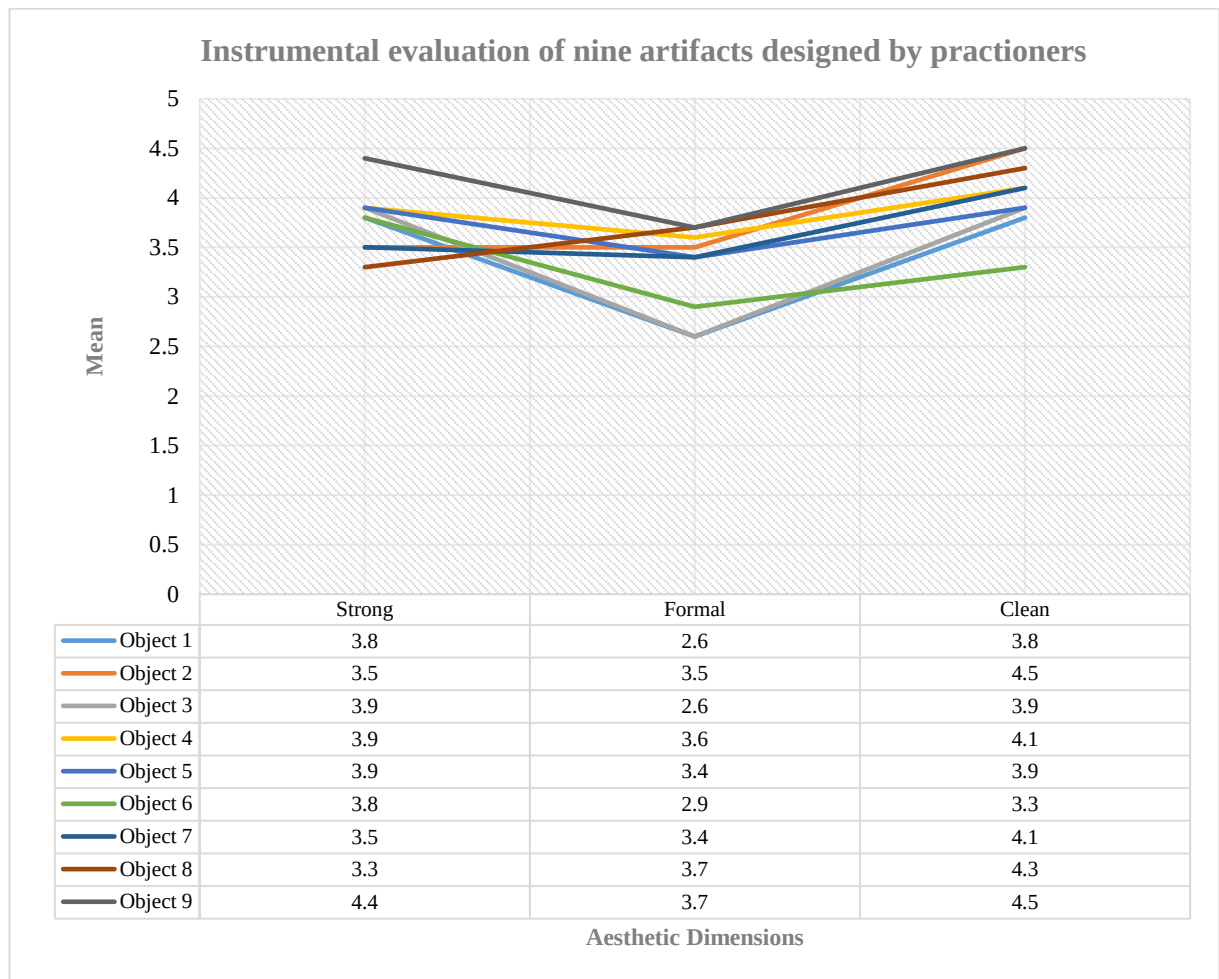


Figure 5-4. Mean ratings for “instrumental.” The results are for the dimensions of “strong,” “clean” and “formal.”

Is the product elegant? Do the participants prefer products that are elegant?

The Collins Dictionary defines the adjective “elegant” in the following way: “if one describes a person or a thing as elegant, they mean they are pleasing and graceful in appearance or style.” An elegant solution is one that has maximum effect for minimum means. Elegance is a unique pairing of two often contradictory qualities: extreme simplicity

and surprising impact. The results (*Figure 5-5*) show that the participants found the artifacts elegant and gave strong support to the idea that people prefer elegant products.

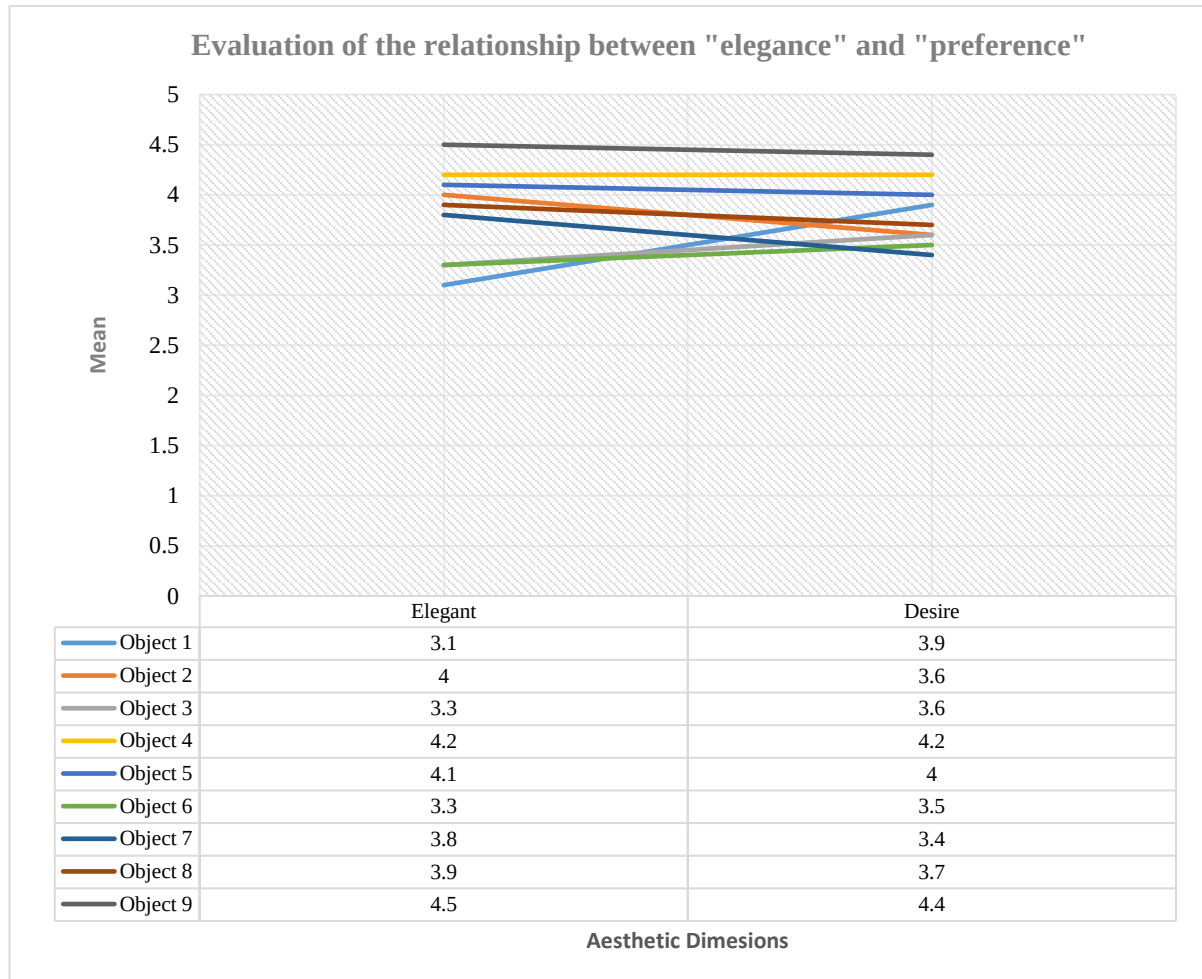


Figure 5-5. Evaluation of the relationship between “elegant” and “preference.”

Does the reputation of the designer affect preference?

In the selected artifact pool there were two artifacts by famous designers – Ettore Sottsass (Artifact 7) and Phillipe Starck (Artifact 9). The results indicated that the participants preferred Artifact 9 to Artifact 7 (see *Figure 5-6*). The follow-up discussion with the participants did clarify that most participants were aware of Phillipe Starck. However, many did not know Sottsass. The results of dimensions such as “dynamic” and “varied” demonstrate that the participants were making conscious evaluation of the artifact dimensions.

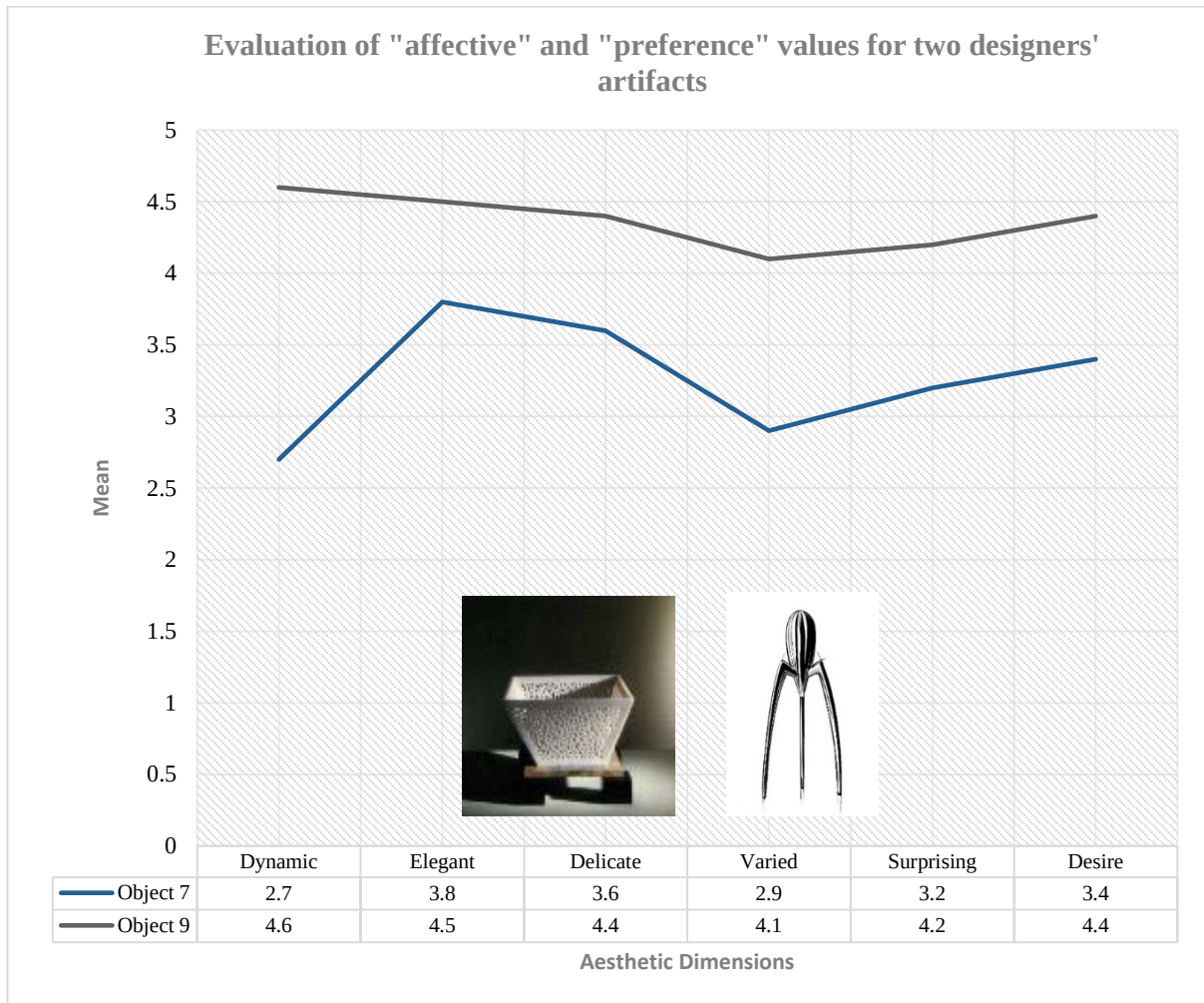


Figure 5-6. Evaluation of “affective” and “preference” values of two artifacts.

5.3.6 Reliability of the scale.

As a final step of scale development, to find out whether the concept scale is reliable, a study was conducted with product forms visualized with narratives from two workshops, “Memory containers” and “De/light” (see Chapter 4). The goal of the study was to investigate whether the aesthetic assessment scale provides reliable results for all artifacts. Different participants should perceive the aesthetic dimensions consistently.

Participants: We recruited the same set of thirty design students from School of Art + Design of University of Illinois who had participated in the previous study. This study was done two weeks after the first study. All students were from the industrial design program,

twenty of them were female (67%), and ten were men (33%). The participants' age ranged from 21 to 28 years, with an average age of 24 years.

Questionnaire: Each participant received a set of questions (*Figure 5-2*) that was based on the adjective pairs for each dimension (for the complete set, see Appendix D). The set was compiled for rating based on each of the nine dimensions for six artifacts. The photograph and the narrative of each artifact were individually illustrated. These six artifacts were selected by the experts from the pool of artifacts collected during two workshops. Three versions of the questionnaire were made in a randomized order.

Procedure: Before the participants got started, test procedures were explained, the narratives were read aloud, and high-resolution color images of the artifacts were projected on the screen. Each participant completed the test individually and rated six products (see *Figure 5-7* and *Figure 5-8*).

Artifacts – Memory Containers		Narrative
		1. <i>Su Fang's summer holidays were spent at her grandparents' house in Malaysia. The house had a huge garden, and she had warm memories of spending happy times there. The images drawn out of her own experience became the starting point of her design.</i>
		2. <i>Ka Man's memory of bedtime stories were landscapes of lightness and happy times – she drew her stories and created the container that was ready to take off into her wonderland.</i>
		3. <i>Xun remembered the worm in an apple she ate as a kid, and her sketch of that incident gave her the inspiration for her concept of this container.</i>

Figure 5-7. Memory containers and related narratives.

Artifacts – De/light	Narrative
 	1. <i>Yanying’s Nightingale Lamp. This lamp hides Yanying’s nightingale, which sings every night. The lamp is full of love, and it touches something deep within, bringing joy and lightness.</i>
 	2. <i>Serene’s Night Drive. The most profound thoughts flow during night drives. Like a car traveling on an endless highway, thoughts can also travel. Under the sea of a myriad colored lights, there is a calm, quiet and relaxed feeling. Serene always feels this quiet calm when she looks out of the car on such drives. “Night Drive” is light in motion, calming the emotions of the viewers, allowing them to experience serenity.</i>
 	3. <i>Brian’s lamp captures the poetic potential of light, the design of a cup of warm coffee and the aroma of cinnamon.</i>

Figure 5-8. Artifacts from the workshop “De/light” and related narratives.

Results: The study was set up to test the reliability of the aesthetic assessment scale. The main question was whether the dimensions of each stimulus were perceived consistently by the thirty participants who assessed the nine dimensions allocated to each artifact. The results produced high reliability values for all three factors (see *Figures 5-9, 5-10, 5-11, 5-12*), and the profiles of both groups of artifacts were perceived consistently by all the participants.

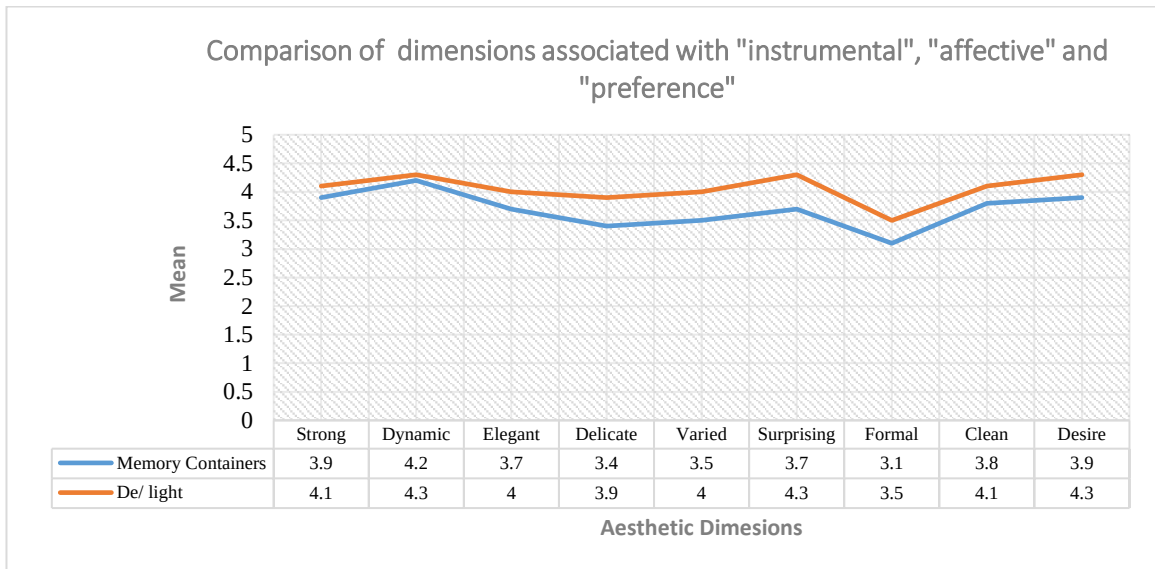


Figure 5-9. Mean ratings for the dimensions associated with “instrumental”, “affective” and “preference.”

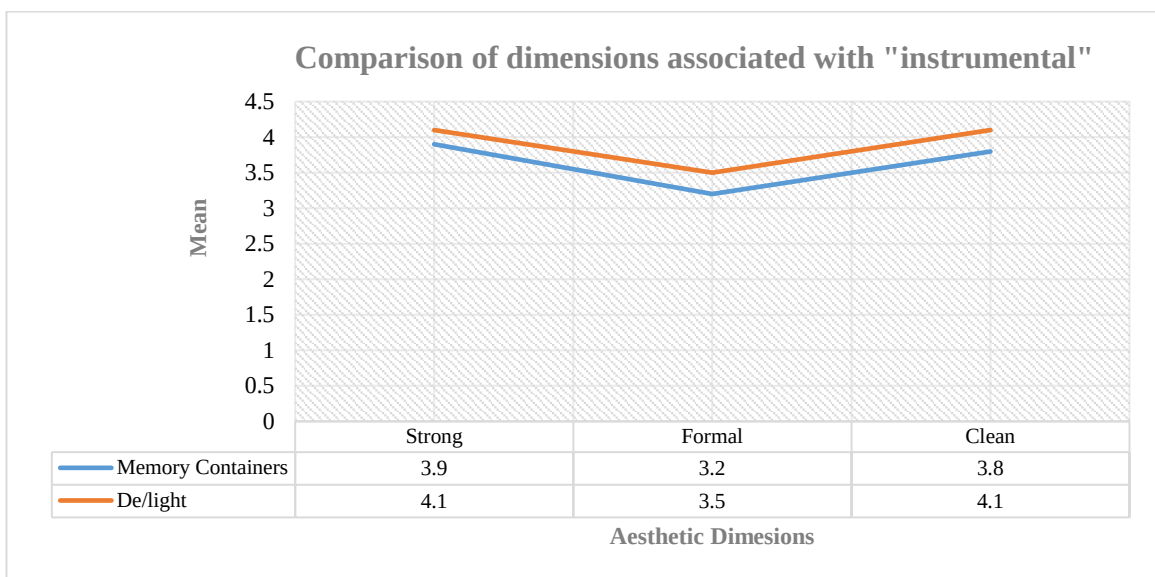


Figure 5-10. Mean ratings for the dimensions associated with “instrumental.”

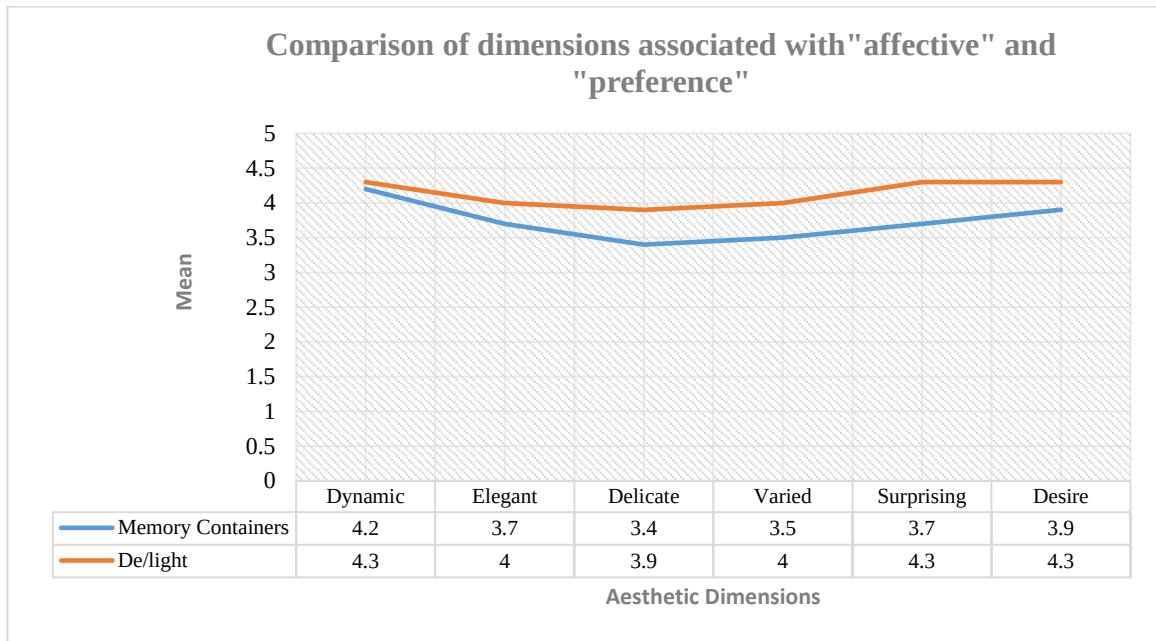


Figure 5-11. Mean ratings for the dimensions associated with “affective” and “preference.”

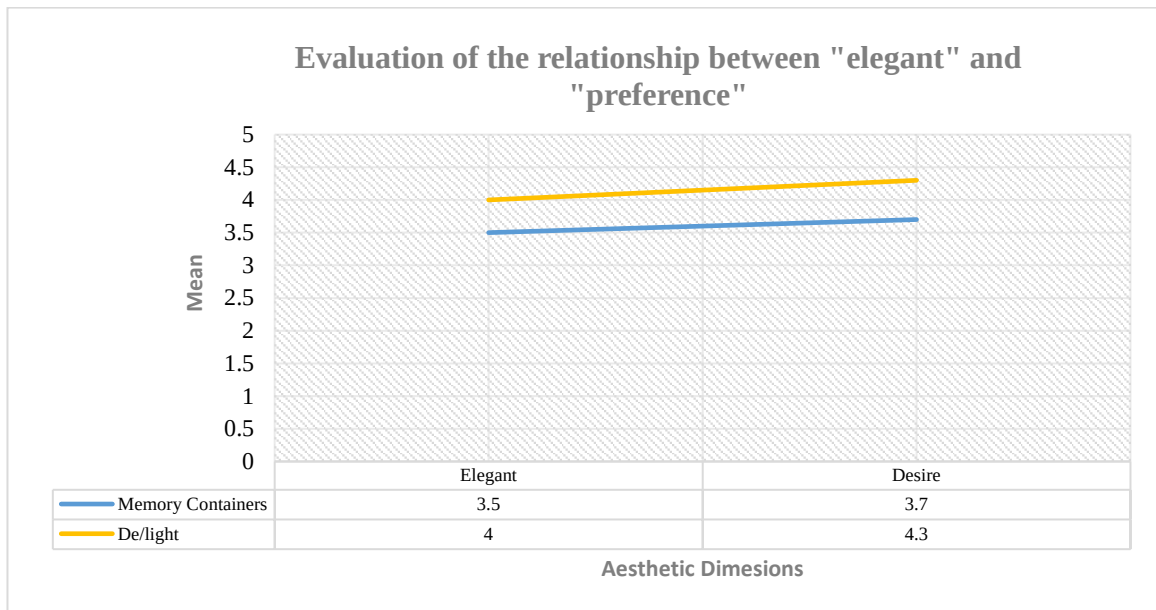


Figure 5-12. The relationship between “elegant” and “preference.”

The outcome of the test gives strong support to the general idea that design students found products created with narratives meaningful.

The results from the two sets of artifacts from the fieldwork show that the three-factor model of “instrumental,” “affective,” and “preference” (Figure 5-13) indicate consistent results for

all items in both pools. The results reflect high reliability values for all items. The artifacts in the pool compiled during the workshops were rated better than the ones from the fieldwork pool (Figure 5-14).

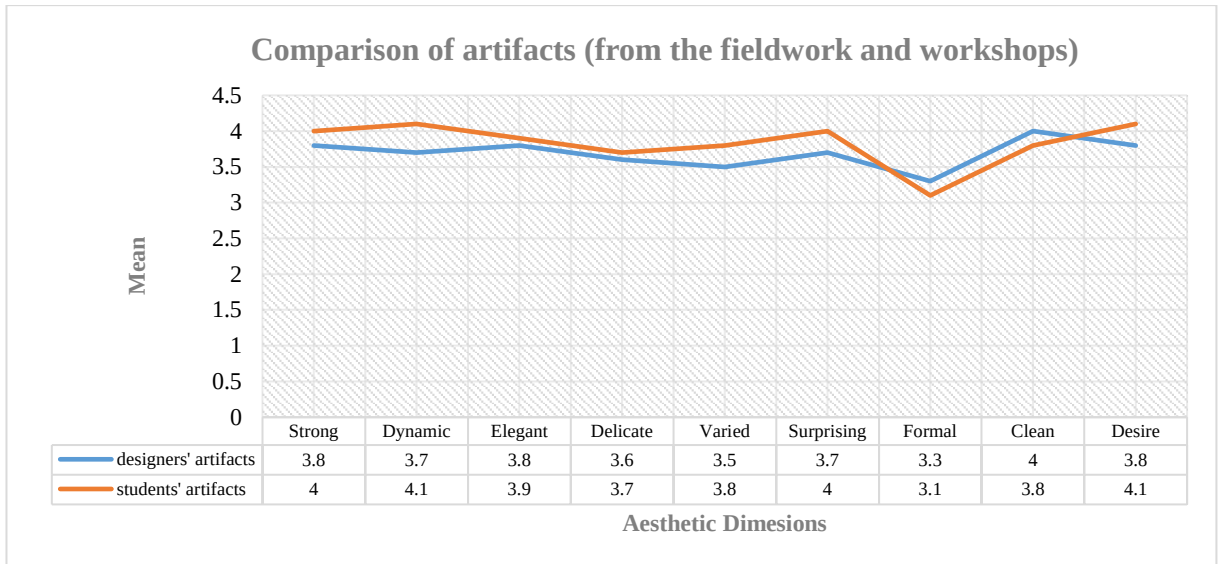


Figure 5-13. Comparison of artifacts from the fieldwork and workshops.

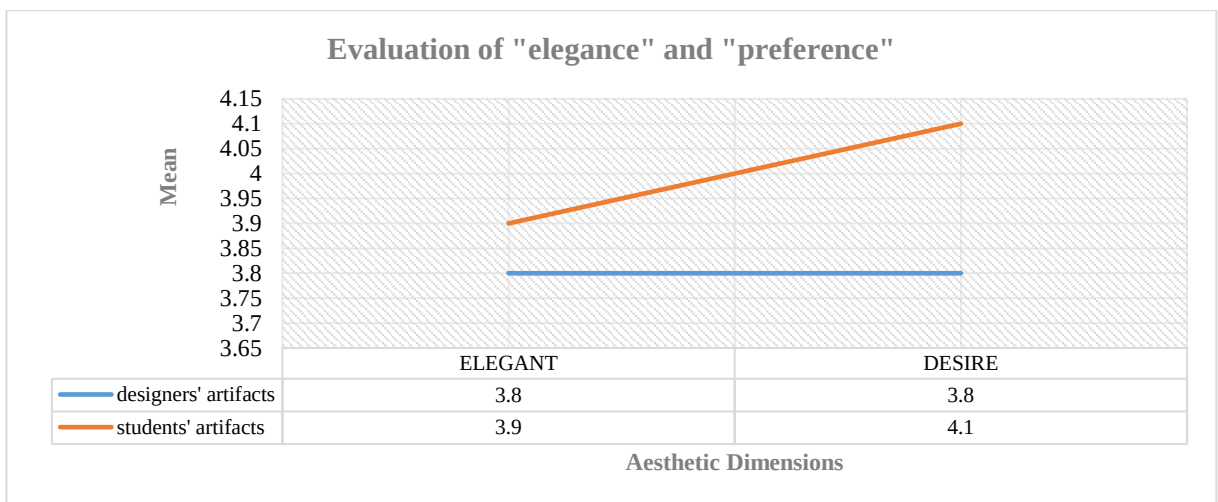


Figure 5-14. Comparison of “elegance” and “preference.”

The scale was tested and validated for fifteen artifacts with narratives. The next step was to create an experiment with the help of this scale to verify that product forms based on narratives are visualized better than the ones without narratives.

5.4 Verifying the Hypothesis

5.4.1 Experiment design.

I chose the project in which workshop participants were asked to design cool boxes with and without narratives (see Chapter 4). The experiment followed a mixed method with three artifacts designed with narratives and three without narratives. Therefore, the participants were split into two groups: one investigating the artifacts with narratives and the other the artifacts without narratives.

Participants: We recruited the same thirty design students from School of Art + Design at UIUC who had taken part in the previous study. All students were from the industrial design program, twenty of them were female (67%), and ten were men (33%). The participants' age ranged from 21 to 28 years, with an average age of 23 years. Participation was part of their studio class.

Questionnaire: Each participant received a set of questions (*Figure 5-2*), which was based on the adjective pairs for each dimension (for the complete set, see Appendix E). The set was compiled for rating based on each of the nine dimensions for six artifacts. The photograph and the narrative of each artifact were individually illustrated. Three versions of the questionnaire were made in a randomized order.

Procedure: Before the participants got started, test procedures were explained, narratives were read aloud, and high-resolution color images of the artifacts were projected on the screen. Each participant completed the test individually and rated three products based on each of the quality dimensions. The artifacts with narratives and without narratives are illustrated in *Figure 5-15*. The stimuli were presented on two sets of three A4 sheets. The study was conducted in a design studio setting, and the rating of the three items took participants 20 minutes to complete.

Stimuli: Color pictures of the artifacts were projected on the screen and a survey was created for rating based on each of the nine dimensions. Each participant in the two groups then individually rated three refrigerators from the aspect of the quality dimensions.

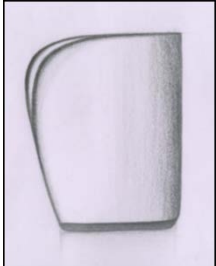
Artifacts with narratives	
	1. <i>The visual impressions of Yuchen's visit to IKEA became the design idea of building this refrigerator. The narrative enabled the act of imagination, the intended meaning and contextual richness of the product form language, which is essential for creating an original product.</i>
	2. <i>The memory of carrying Aboli Joshi's first Star War book on a flight was the design idea of creating this refrigerator. As the light gives the product a sense of magic and wonder, the act of reaching for the food is always an adventure.</i>
	3. <i>Based on Atin's childhood memory, the circle represents the juvenile and frolic nature of young blood. Orange is also the color of youth, which was used with overlapping grey circles to create a sense of friction.</i>
Artifacts without narratives	
	 The fridge door doubles as a seat. It can be placed both horizontally and vertically. 

Figure 5-15. Artifacts designed with narratives and without narratives.

5.4.2. Results of the experiment

The results of a one-way analysis of variance (ANOVA) are summarized in Tables 5-9, 5-10 and 5-11.

Table 5-9

Results for “instrumental” with and without narratives

Source	SS	df	MS	F
Between treatments	16.8056	1	16.8056	11.26606
Within treatments	265.5222	178	1.4917	
Total	282.3278	179		

The main effect of the narrative treatment (“instrumental”) was significant, with $F = 11.26$ and $p < .05$.

Table 5-10

Results for “affective” with and without narratives

Source	SS	df	MS	F
Between treatments	9.72	1	9.72	5.92796
Within treatments	488.6267	298	1.6397	
Total	498.3467	299		

The main effect of the narrative treatment (“affective”) was significant, with $F = 5.92$ and $p < .05$.

Table 5-11
Results for “preference” with and without narratives

Source	SS	df	MS	F
Between treatments	3.2667	1	3.2667	4.50396
Within treatments	42.0667	58	0.7253	
Total	45.3333	59		

The main effect of the narrative treatment (“preference”) was significant, with $F = 4.50$ and $p < .05$.

5.4.3 Limitations

The research has some inherent limitations as, according to Ossi Naukkarinen (2010), aesthetic judgment cannot be proven right or wrong by scientific methods, and aesthetic qualities cannot be directly measured. The method of both making and analyzing aesthetic judgment is a discussion. Naukkarinen believes that aesthetic issues have to be discussed to be defined, explaining that aesthetic judgements may vary with evaluators and that no scale exists for aesthetic judgements. The point of aesthetic judgments is to get others to agree, rather than find the absolute truth. Data collected through quantitative means may be meaningful, but it still needs confirmation from the experts.

5.5 Evaluation

There were two stages of the evaluation process – first there was an evaluation with external experts and then with the target students.

5.5.1 Evaluation with Experts: The expert evaluation team consisted of members of academia as well as professors of design and related fields. The evaluation had a twofold task:

1. To obtain feedback on the relevance, meaningfulness and impact of the three-step narrative framework for product form visualization, and

2. To define areas for further improvement.

Individual interviews conducted with nine experts (Table 5-12) of industrial design, graphic design, design studies, communication design, media design, interaction design, and aesthetics, allowed for detailed communication with each interviewee, and provided rich feedback.

Table 5-12
List of Expert Evaluators

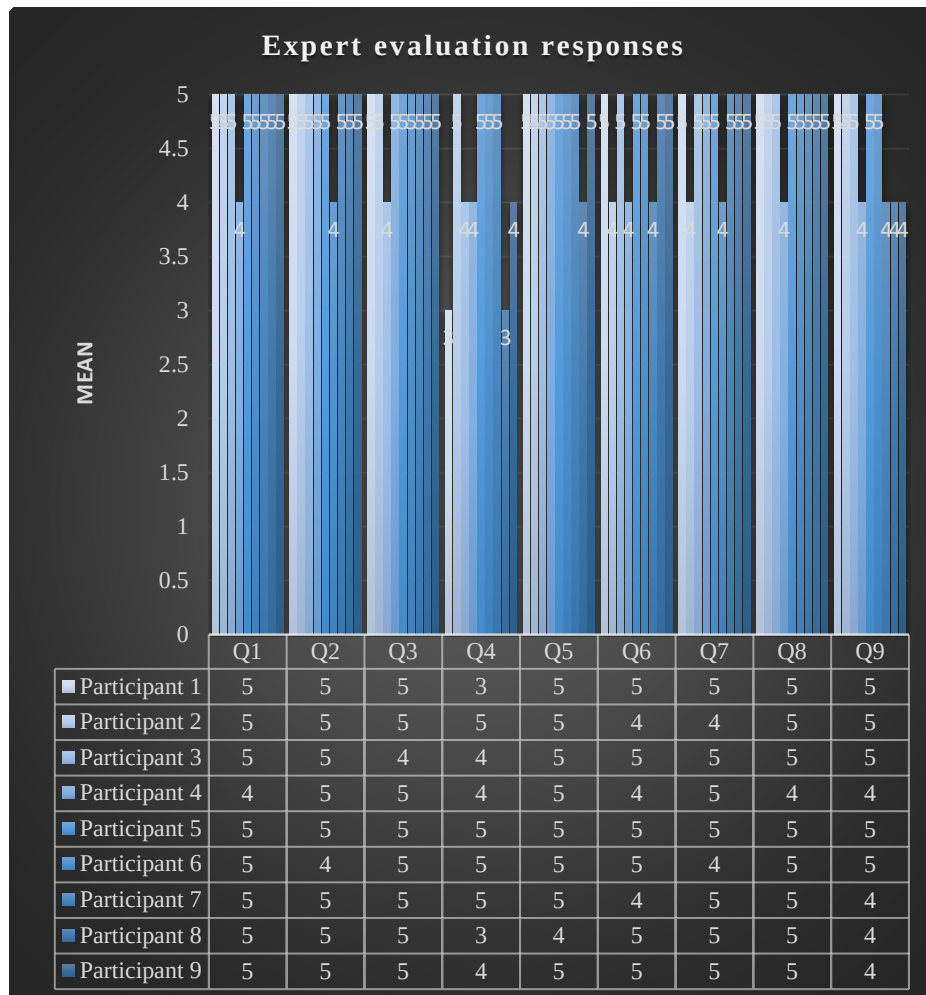
Participants	Background	
Expert 1	Associate Professor – Design Studies	Ph.D. (Arts & Social Sciences), M.Des. (ID Practice)
Expert 2	Associate Professor, Aesthetics	Ph.D. (Philosophy of Education)
Expert 3	Assistant Professor – Graphic Design	MFA (Design Research)
Expert 4	Assistant Professor – Graphic Design	Ph.D. (Design)
Expert 5	Professor – Design	Ph.D. (English and Communication)
Expert 6	Clinical Professor – Interaction & Industrial Design	M.Des. (Industrial Design)
Expert 7	Professor – Industrial Design	M.Des. (Industrial Design)
Expert 8	Professor and Chair – Industrial Design	MFA (Design)
Expert 9	Professor and Head – Landscape Architecture	Ph.D. (Natural Resources – Environment)

Each session was approximately 90 minutes long and they were divided into two stages: (a) the introduction of the project context and the presentation of the process and the outcome (45 minutes) and (b) the discussion and the questions (45 minutes). All sessions were face-to-face discussions, and each interviewee was asked the same questions (see Table 5-13) regarding the clarity, benefits, and strengths of the three-step narrative framework. They were also asked to give suggestions for the improvement of the framework (Appendix F).

Table 5-13
List of Questions

Questions	
Q1	What is your general impression of the three-step narrative process?
Q2	Do you agree that there are clear benefits of using this process in product form visualization, which would improve the conceptualization process?
Q3	Do you agree that the proposed three-step narrative process adds value to the concept creation?
Q4	Do you agree that the framework gives structure to the process?
Q5	Do you agree that the use of narratives improves communication?
Q6	Do you agree that the process builds confidence in the designer's abilities?
Q7	Does this way of working helps to create strong output?
Q8	Do you agree that the three-step process is clear and beneficial?
Q9	Is using narratives a good way to realize product form?
Please give constructive feedback and suggestions	

Table 5-14
Expert evaluation responses



Results: The results of the evaluation are shown in Table 5-14. In general, the three-step narrative process received very positive responses from all the interviewees – the average score for each question was equal to or above 3 (good). They were pleased with the proposed use of narratives to “give students wings” to visualize concepts and encouragement to break away from the trends dominating the market. They all felt that this framework gave the students freedom to create original product forms. They also provided valuable comments for further improvement (Table 5-15).

Table 5-15

Feedback and suggestions from experts

Feedback and suggestions
• It is definitely a great framework to stimulate creativity in young designers/students. • It is a helpful model to discover potential expressions and a new language. • It helps to create strong and innovative output. • The difference between personal experience and user experience should be further explored. • It is interesting to think about the possible ways to incorporate the process at various stages in various ways. • It is an excellent idea – it integrates art and design. • It should be explored how faculty can apply this idea in the digital work of interaction design. • It should be explored at which stage of students’ academic career this exercise makes the most sense. • It is a useful framework for design conceptualization once the function of the product is stabilized. • It would be interesting to see how the first drawing or painting – the form of narrative expression – changes the outcome once the product brief is introduced.

5.5.2 Evaluation with Target Students

The three-step narrative framework was then tested in a workshop with design students of UIUC, who are the primary target users of this process and the research focus of this study. The students were majoring in industrial design and graphic design, and they were all in the third year of their study program.

The evaluation workshop took 2.5 hours. First, the three-step narrative process was explained, then we discussed the overall impressions, as well as its functionality and feasibility. Finally, the students were asked whether they would use this process in their studio projects. After the workshop, the participants were requested to fill out a questionnaire, adding their comments (Appendix F). The evaluation responses are shown in Table 5-16 and the feedback is outlined in Table 5-17. All workshop participants were in favor of the three-step narrative framework.

Table 5-16
Students' evaluation responses

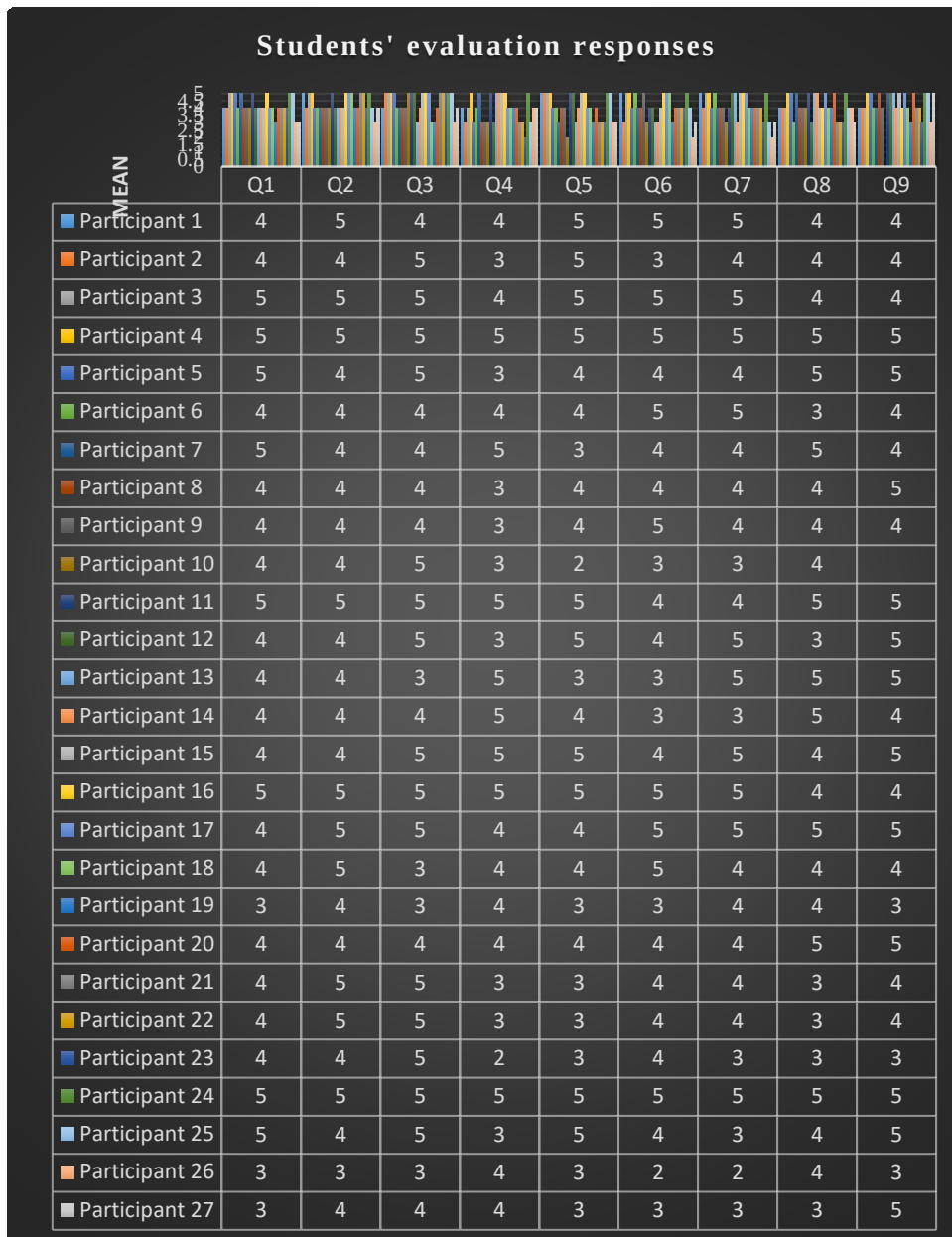


Table 5-17

Feedback and suggestions from target students

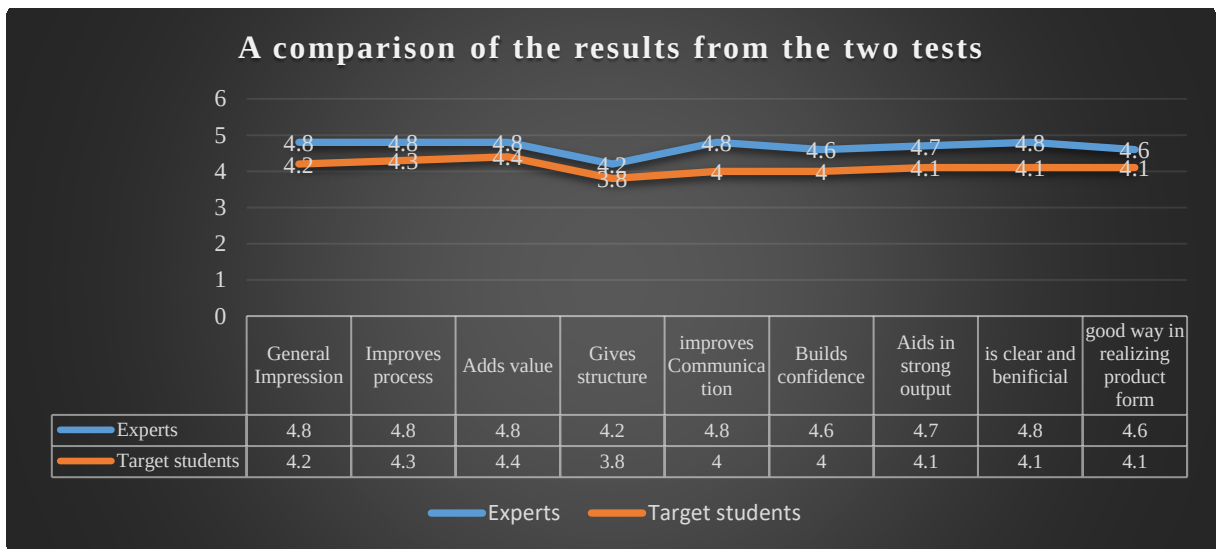
Feedback and suggestions
• Personal connection is really unique and helpful for students. • The three-step process is a great way to bring new creative ideas to design. Without it, the designer might become attached to an idea too much, which might make them narrow-minded. • It would be useful to investigate how the framework could be integrated with other constraints and considerations, for example materials, manufacturing, sustainability, engineering, or physics. Does this process still work when you consider limitations? • It is actually a smart idea to translate stories into products. • The framework gives great organization for unorganized designers. • Having a story seems to make the product more meaningful. • This framework is really valuable, but it would be interesting to investigate how these very personal narratives/objects relate to other people.

The questions discussed in the two evaluations were categorized in the following way: the process improves conceptualization, it helps to create strong output, it gives structure, it improves communication and it is a good framework for designing product form. Table 5-18 reveals the similarities and differences between the average score on each of the categories received from the two groups of participants. The following conclusions can be drawn:

- Firstly, all of the participants believe that the three-step process can realize its primary function, which is to aid designers in visualizing the product form.
- The experts were more positive than the design students regarding all the aspects of the three-step narrative process.
- Most of the participants of both evaluations liked the output and were keen on using this framework – experts in teaching and students in visualization.
- Experts were interested in exploring how to incorporate this framework in various stages of the design process.
- Both groups were interested in seeing the outcome of the three-step process in real-world projects.
- Overall, the three-step narrative framework won approval from both groups of participants.

Table 5-18

A comparison of evaluation responses from experts and target students



5.6 The relevance of the three-step narrative process

Designers seek, express, confirm and ascertain a sense of being through their creation. Design students take the category of a product form for granted – when they have to design, say, a lamp – they look at all the “lamps” and design a “lamp” – the challenge is to make an ordinary object extraordinary. The use of narratives captures the essence of a designer’s experience, which helps to conceptualize product form. Narratives forge links between the function and emotions.

The function and the use of the product are the elements we take for granted – we do not question, for example, why a lamp lights up. In contrast, when one encounters an exception to a given function and wants to grasp what is happening, they will always come up with a narrative that gives reasons. The function of this narrative is to find a story that makes a deviation from a canonical cultural pattern comprehensible. Narratives interpret form and what form means to them. It mediates between the functional world of the object and the expanded world of beliefs, desires, and hopes. It renders emotions comprehensible; it frames the experience and provides the means to construct the product form.

Researchers have focused their research on product appearance and have demonstrated that it is possible to design products with predefined personality (Schoormans, 2011). According to the Kansei Engineering methodology, the aim of design is to translate impressions, feelings, and emotions that the consumer considers important into the attributes of a product. However, little information is offered by scholars regarding how designers translate those impressions, feelings, and emotions (Schütte, Ishihara, Eklund, & Nagamachi, 2008).

Most research on product personality has been focused on consumer preferences and behavior, and products have been designed in a short period (e.g. three products were created during a 45-minutes session, for details see Govers, Hekkert, and Schoormans, 2004). These stimuli were used to test whether personality embodied in product appearance was recognized as such by the consumers. The Govers et al. research relied on designers' skills to embody selected personalities in three products by using their approach, and thus it is not reported how designers created the stimuli. This raises important questions regarding stimuli creation for research on product appearance. The issue of how the designer interprets the emotion he or she embodies in the visualized form is also worth considering. To be able to assess the stimuli, they should be complete and coherent – they should have the necessary information with which respondents can perceive the same meaning and references as those intended by designers. One cannot visualize an emotion or a personality without a context. “The typical form of framing experience (and our memory of it) is in narrative form” (Bruner, 1990, p. 56).

When we want to remember something, citing the work of Frederic Bartlett, Bruner quotes “what most often comes first to mind is the charged ‘attitude’ – that it was something... that was exciting. The effect is rather like a general thumbprint of the schema to be reconstructed. The recall is then a construction made largely by this attitude and its general effect is that of a justification of the attitude” (Bruner, 1990, p. 58). The narrative approach of conceptualizing product form has a human side to making sense (Bruner, 1986). The designer's capacity to render experience regarding narrative is an instrument for making meaning of the product form and is a reconstruction designed to justify. “The objective of such a means is not to reconcile, not to legitimize, not even to excuse, but rather to explicate” (Bruner, 1990, p. 95)

The results of the study confirm that using narratives at the conceptualization phase of the design process structured the perception and organized designers' own experiences to generate the product form. These findings have clear implications for design education: teaching designers to use narratives as part of their concept generation, especially in the early stages of design when concepts are ambiguous, has the potential to produce new interpretations. "When designers are producing drawings entirely for their benefit as opposed to presenting information to others, this reflective process is almost the whole part of the drawing. It is these design drawings, sketches, scribbles, diagrams and the like that most offer this conversational potential" (Lawson, 2006, p. 278). Such drawings are done by the designer not to communicate with others, but rather as part of the very thinking process enabling them to visualize product form. The process that starts with ambiguity and anxiety also makes the designer wonder, and when the solution is made visible, it is sheer surprise and astonishment for everyone.

In the act of designing a new product form, designers always aspire to create an idea that is original (novel), instrumental (functional) and affective (surprising). The question is how designers' experience and values influence the final choice of the product form. Michael Allen's dual process model about the effects of consumers' values could give some direction – or justification – to the proposed three-step narrative model. According to Allen, utilitarian meaning stems from the underlying essential function of a product and its physical attributes, and it is evaluated in a logical, attribute-by-attribute fashion. Similarly, when designers work with a traditional design process – i.e. the work is done in a piecemeal way – the final product form tends to be judged analytically, not affectively. On the other hand, sensory and emotional meanings are likely to be judged affectively, which involves a holistic judgment, based on the intangible attributes of the product as a whole (Allen, 2000). Similarly, expressive product forms may be created directly and quickly by narratives of self-expression and experiences. Table 5-19 depicts the proposed process – form flows from narrative (which follows Allen's product meaning approach –Appendix G and Bruner's two modes of thought –Appendix H).

Table 5-19

Comparison of design processes with or without narrative

	Form follows Function	Form flows from Narrative
Objective	Product-focused. To create an ideal form - establishing rational order by reducing the whole to a simple sum of parts	Self-focused. To create an aesthetic form - To endow experience with meaning, synthesizing to a unified whole (organic unity)
Strategy	Function, features, and utility create the product form	Self expression is the vehicle to create the product form
Method	- Empirical discovery guided by reasoned hypothesis – indifferent to the individual designer personality - Design process: step y step and logical	- Universal understanding grounded in personal experience – form discovery is dependent on designer’s subjective judgement - Design process intuitive and holistic
Motivation	Competency and control	Attitude, identity, and approval
Key Characteristics	- Sound argument - Tight analysis - Theory drawn - Categorical - General - Reasons - Analytics Product form justification is weak.	- Good narrative - Inspiring account - Meaning centered - Experimental - Particular - Associations - Aesthetics Product Form justification is strong

Form follows Function: The traditional model to visualize product form



Form flows from Narrative: A representation of the proposed three-step narrative model to visualize product form.

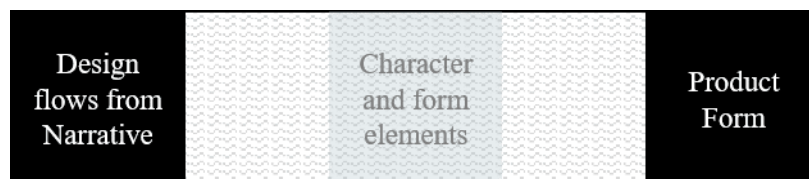


Figure 5-16. The three-step narrative model for visualizing product form

Figure 5-16 summarizes the proposed three-step narrative model of how to use the narrative – i.e. a sequence of events and expressions, real or imaginary. When events are seen through a personal prism, they reveal the human side of design and visualizing a product form. When one embeds personal experiences as narratives in the form of the object, such objects are regarded as part of the self. The creation of a concept is an attempt to extend the self in a new way (Belk, 1987). In claiming that design is “mine,” designers also come to believe that the object is “me.” Such objects confirm our identities (McCarthy, 1984).

Chapter 6 Conclusion

In our research we investigated the role of narrative in visualizing product form. We evaluated and analyzed different artifacts with and without narratives. We hypothesized that product forms visualized with narratives would help the designer to be significantly more successful than forms without narratives. The results strengthen the use of the three factors – “instrumental,” “affective” and “preference” – that reflect the expressive qualities and the unity of the designed artifacts.

Using narratives as a design tool is one way in which designers visualize product form expressively and emotionally rather than working with just functional tools. In these examples, the narrative structure may be thought of as the process mediating the perception of relationships among the product and the self. The narrative may also be regarded as the structure which allows the designer to generate the product. The character of the product emerges out of the material from the designer’s own life – by recalling ideas and emotions from the designer’s past.

The study confirmed that designing with narratives is meaningful to the students. All respondents found that these artifacts had a central focus. Narratives engaged them, and they could connect with the narratives in the artifacts. The outcome of the research indicated that the concept of narratives is meaningful to design students, and this could be observed in products designed by different designers. The benefits of the natural and spontaneous use of narratives

are evident from these examples. Understanding of the importance of the narrative in design will make it an essential framework in generating product form.

Evidence from this research suggests that students' creative ability to visualize product form can be enhanced through a carefully constructed method. This provides a basis for future research in developing design using images/stories/lived experiences to support efficient ideation and realization of concepts in the product design process. Design should be understood as an entity embedded in daily living, coming from one's interaction with the world. The designer will discover that designing is not set apart from daily life but springs forth from visual impressions of one's own experiences. In this act of exploration, there is a discovery of the self, which brings out meaning, instills ownership, brings focus, improves choice making, and constructs new confidence. Narratives provide a method for encouraging reflective thinking about design by conceivably expanding the realm of issues one might consider when engaged in a purely functional form.

6.1 Research Claims

Evidence from this research suggest that student creative ability to visualize product form can be enhanced through use of narrative, and as demonstrated in the thesis the use of narrative captures the essence of designer's experience to visualize product form.

The study found designers visualize product form using narratives embedded in daily living, and spring's forth their own interaction with the world and visual impressions of one's own experiences.

The study collected samples of designed products from practicing designers that make evident the personal experiences, thoughts and feelings of the designers in the act of visualizing a new product form.

The proposed three steps narrative model of how the use of narrative - in this case a sequence of events and expression – whether real or imaginary, when seen through a particular sense of personal prism, forges a link of human side in visualizing a product form.

The aspect of using narrative to visualize product form is a *novel* approach. In design research there are few studies that provide the perspectives of designers' experiences to visualize product form. Understanding of personal ways of visualizing product form are normally left out of design research as rational design method ignore subjectivity and attempt to neutralize any sense of individual perspective of designers.

Designers construct narrative to make sense of experiences. Self-expression is done primarily through narrative construction and communication. The narrative provides a framework for encouraging reflective thinking about design – conceivably expanding the question of how designers experience and values influence the final choice of creating the product form.

The three steps narrative framework to elicit product form was tested and implemented by students in China, India and Singapore and by practicing designers in China and India to visualize product form with positive results. This approach to support the elicitation of product form is new compared to previous work as it gives a voice to the designer's viewpoint by incorporating subjective experience in visualizing product form.

6.2 Future Directions

The evaluation stage was reliant upon having a convincing and working three-step narrative process. The model evolved over seven workshops conducted in academic environment in three different countries and in the in-house design department of an appliance company. The final workshop was sponsored by the appliance company and the participants were all industrial design students. The workshop was a controlled session, and the output was not validated beyond the academic environment. The confidence of the three-step framework comes from the fact that the outcomes from the workshop sponsored by the appliance company were produced and successfully launched onto the market. The evaluation with experts showed that the framework might also be useful in other areas, such as interaction design. Despite the limitations, the evaluation demonstrated that the three-step narrative process strongly interests design faculty and provides a firm foundation for design students.

This thesis provides a basis for future research in developing design and using narratives from designers' own experiences to support efficient realization of concepts in the design process. From a research perspective, an understanding of the relationship between narratives, product form generation, and evaluation serves as a foundation for understanding how designers arrive at the appropriate form to a function. Given that one aim of this research was to build a model that would apply to all kinds of products, directions for further research could focus particularly on three areas: 1) the role of the product type, 2) understanding how to increase the number of generated ideas that are accepted and valuable to a development project, and 3) the role of narratives in reducing uncertainty in the design process and in building intrinsic motivation for the designer.

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Appendices

Appendix A: Aesthetic terms from students

beauty	pure	complex	emotional	strong	interesting
straight	organic	comfort	tasty	innovative	sensational
smple	modern	colorful	pleasure	aggressive	sympathetic
active	calm	abstract			
functional	intimate	balanced	strong	beautiful	holistic
bold	inviting	sleek	refined	elegant	flowing
thoughtful	harmonious	fit	perpetual	timeless	reliable
versatile	cultural				
unique	convenient	productive	creative	out-of-world	fantastic
efficient	innovative	pleasing	aesthetic	long-lasting	special
meaningful	unlimited	extravagant	time-saving	spectacular	smart
control	diverse	honest			
minimal	simple	user-friendly	ergonomic	clean	natural
holistic	modern	dynamic	strong	beautiful	functional
vibrant	lively	unobtrusive	cohesive	intelligent	smart
powerful	contemporary				
unique	creative	personal	impactful	interpersonal	intrapersonal
environmental	static	dynamic	resourceful	interactive	critical
necessary	progress	productive	varied	applicable	adaptive
insightful	extension	tool	process	aesthetic	ergonomic
white	ergonomic	elegant	beautiful	function	form
black	circle	curve	durable	sustainable	manufacture
friendly	minimal	simple	weird	novelness	smart
color	pleasing				made-in-china
innovation	economical	sustainable	elegant	new	AI
multidisciplinary	user-experience	floating	simplicity	smart	
innovative	multifunctional	novel	elegant	bright	minimalist
functional	modern	classic	symmetrical	balance	prob-solving
simple	cool-tones	interactive	experience	diverse	aesthetic
unobtrusive	honest				
sleek	simplicity	minimalistic	ergonomic	user-friendly	elegant
innovative	durable	efficient	classy	out-of-box	shiny
colorful	unique	compact	sustainable	clean	smart
aesthetic	secure				
function	process	persona	sample	prototype	manufacturing
story-board	molding	sustainability	target	goal	market
material	solution	screen-printing	graphic	user-review	precise
analysis					
Inspiring	functional	Innovation	Durable	Vivid	Comprehensive
dynamic	diverse	visual	flexible	simple	plastic
unique	cultural	delicate	imagery	interactive	enjoyable
meaningful	aesthetic	smooth			
balance	asymmetrical	asymmetrical	variety	original	Imitative
simple	abstract	elaborate	complex	emotional	stable
normal	surprising	intriguing	monotone	cold	sophisticated
optimal					
brainstorm	storyboard	card-sorting	sketching	user-journey-map	user-center-design
persona	drawing	Mood board	diagram	research	simplicity
streamline	futuristic	user-experience	user-interface	colorful	Less-is-more
prototyping					
innovative	dynamic	sleek	minimalist	modern	cultural
color-scheme	visualization	radial	diagram	fashion	sequence
Focus	balance	repetition	contrast	hierarchy	mock-up
pixel					
ergonomic	minimalistic	sustainable	ecofriendly	innovative	revolutionary
simplistic	efficient	durable	sleek	elegant	refreshing
unique	modular	smart	aesthetic		
functional	fashion	attractive	fantastic	awesome	aesthetic
modern	ergonomic	Interactive	Human-centered	considerable	special
cool	suitable	fit	excited	desired	sympathetic
creative	innovative				
dynamic	diversity	develop	fantastic	fresh	sustainable
speculative	conceptual	functional	fabulous	delicate	special
fit	less	more	creative	Fashion	

simple	inviting	delicate	strong	gentle	flowing
balance	dynamic	light	organic	calm	minimal
vibrant	soft	clean	beautiful	continuous	symmetrical
bright	happy				
clean	minimal	beautiful	honest	bold	aggressive
cute	sleek	elegant	rustic	homely	friendly
futuristic	imposing	functional	modern	stoic	nordic
Japanese	flow	voluptuous	Braun	magical	
beautiful	comfort	pleasantness	pleasure	elegant	concise
clean	surprising	strong	creative	fancy	novel
safe	quiet	neutral	calm	simple	vivid
dynamic	smooth	Apple			
beautiful	simple	elegant	portable	light	impressive
joyful	useful	functional	understandable	attractive	smooth
awful	safe	quiet	calm	secure	immersive
gentle	familiar				
beautiful	flawless	elegant	plain	simplicity	sophisticated
steady	flaw	friendly	futuristic	retro	renaissance
joy	happiness	purity	optimism	cheerful	cleanliness
low fidelity	hi fidelity	functionality	dark	bright	neutral
Hi-touch					
different	strong	light	dynamic	elegant	beautiful
conceptual	futuristic	vivid	user-friendly	peaceful	smooth
happy	joyful	simplify	oasis	Sense driven	experience
tender	glare				
simple	complex	soft	beautiful	rigid	ugly
harsh	clean	busy	hostile	disruptive	open
purposeful	organic	cool (temp)	warm	multi_layer	gaudy
tacky	affective	large	minimal		
Elegant	eye-catching	harmonious	vivid	spirit	simple
surprising	innovative	delicate	variable	practical	futuristic
detail	useful	meaningful	respect	beautiful	graceful
friendly					

Appendix B: Selection of aesthetic terms used to describe product form

Integrated	Handsome	Vivid	Balanced	Powerful	Varied		1
Surprising	Elegant	Delicate	Dynamic	Graceful	Varied	Novel	2
Elegant	Powerful	Surprising	Delicate	Dainty	Varied	Novel	3
Balanced	Delicate	Dainty	Elegant	Sentimental	Varied	Novel	4
Balanced	Surprising	Integrated	Dainty	Powerful	Varied		5
Unified	Beautiful	Strong	Dynamic	Powerful	Varied	Novel	6
Sentimental	Balanced	Beautiful	Dynamic	Surprising	Varied	Novel	7
Delicate	Elegant	Sentimental	Graceful	Strong	Varied	Novel	8
Beautiful	Serene	Balanced	Strong	Moving		Novel	9
Dynamic	Integrated	Balanced	Surprising	Elegant	Varied	Novel	10
Balanced	Dainty	Dynamic	Powerful	Elegant	Varied	Novel	11
Dynamic	Delicate	Vivid	Balanced	Strong	Varied	Novel	12
Beautiful	Moving	Surprising	Sentimental	Serene	Varied*	Novel	13
Strong	Powerful	Elegant	Balanced	Handsome	Varied	Novel	14
Dynamic	Surprising	Vivid	Powerful	Moving	Varied	Novel	15
Elegant	Surprising	Dynamic	Sentimental	Handsome	Varied	Novel	16
Elegant	Powerful	Vivid	Balanced	Handsome	Varied	Novel	17
Elegant	Dynamic	Balanced	Graceful	Powerful	Varied	Novel	18
Strong	Powerful	Dynamic	Vivid	Beautiful	Varied	Novel	19
Beautiful	Elegant	Surprising	Sentimental	Powerful	Varied	Novel	20
Dynamic	Elegant	Strong	Delicate	Integrated	Varied	Novel	21
Surprising	Delicate	Powerful ⁹	Balanced	Elegant	Varied	Novel	22
Elegant	Beautiful	Dynamic	Powerful	Balanced	Varied	Novel	23
Dynamic	Elegant	Balanced	Strong	Serene	Varied	Novel	24
Powerful	Beautiful	Elegant	Sentimental	Balanced		Novel	25
Elegant	Unified	Strong	Graceful	Vivid	Varied	Novel	26
Handsome	Integrated	Powerful	Delicate	Elegant	Varied	Novel	27
Dynamic	Unified	Beautiful	Integrated	Moving	Varied		28
Handsome	Integrated	Dynamic	Strong	Unified	Varied		29
Vivid	Beautiful	Delicate	Elegant	Balanced	Varied	Novel	30
Powerful	Integrated	Beautiful	Dynamic	Strong	Varied		31
Powerful	Graceful	Handsome	Strong	Dynamic	Varied		32
Integrated	Beautiful	Strong	Unified	Balanced	Varied		33
Balanced	Moving	Dynamic	Unified	Vivid	Varied	Novel	34
Strong	Balanced	Elegant	Sentimental	Unified	Varied		35
Balanced	Dynamic	Beautiful	Sentimental	Strong	Varied	Novel	36
Balanced	Unified	Dynamic	Delicate	Elegant	Varied	Novel	37
Balanced	Unified	Serene	Beautiful	Balanced	Varied	Novel	38
Beautiful	Sentimental	Elegant	Unified	Dynamic	Varied	Novel	39
Strong	Elegant	Dynamic	Sentimental	Unified	Varied		40
Beautiful	Graceful	Delicate	Elegant	Integrated		Novel	41
Beautiful	Strong	Elegant	Graceful	Balanced	Varied	Novel	42
Balanced	Powerful	Dynamic	Integrated	Beautiful	Varied	Novel	43
Balanced	Dynamic	Elegant	Powerful	Unified	Varied		44
Vivid	Dynamic	Strong	Balanced	Unified	Varied	Novel	45
Dynamic	Beautiful	Strong	Vivid	Balanced	Varied	Novel	46
Beautiful	Strong	Dynamic	Unified	Balanced	Varied	Novel	47
Strong	Dynamic	Beautiful	Integrated	Balanced	Varied	Novel	48
Balanced	Vivid ¹	Dynamic	Beautiful	Powerful	Varied		49
Elegant	Beautiful	Balanced	Dynamic	Strong	Varied	Novel	50
Strong	Beautiful	Sentimental	Dynamic		Varied	Novel	51
Unified	Balanced	Dynamic	Integrated	Vivid	Varied	Novel	52
Functional	Beautiful	Delicate	Moving	Strong	Varied	Novel	53
Integrated	Elegant	Strong	Vivid	Sentimental	Varied	Novel	54
Durable	Pleasing	Functional	Dynamic	Useful	Varied	Novel	55
Vivid	Powerful	Dynamic	Balanced	Elegant	Varied	Novel	56
Beautiful	Powerful	Graceful	Somber	Moving	Varied	Novel	57

Appendix C: Survey questionnaire - artefacts' pool from practitioners

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

Designed by Giovanni Levanti for Concept design, Sweden is a home-gymnasium. It's just one functional piece of furniture that can be placed in any room of your home.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

The baby - pure cause of the Swedish tradition - which led to the metaphor "Stollen" produced in 2010.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

When I designed the first Center with Wheels in the Marketplace I reflected back to childhood having a red wagon.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

Mahlbren is a traditional Arab reverse barman, an evocative object of daily domestic use in the Arab world. Contemporary time at Dubai comes out in these, handcrafted, glass pieces.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

Francesca Brulov's love for Africa and his fascination to how he could not talk to someone sitting next to him led him to design this table!



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

I designed Lupta as a solution to environmentally-consciousness most production and world hunger, but the design process that led to this solution was a personal journey down memory lane. As a child growing up in the West African nation of Togo, I used to eat groundpeppers and flying ants as a cultural ritual and a source of protein.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

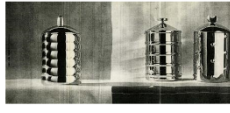
Etienne Sottsass natural way of documenting his journey yielded simple sketches (observational) that, in time, evolved clearly design theme for his current project. His drawings were not a random inspiration. A designers mind will process rich observations, narratives from her/his life experiences and crystallize these into design directions.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

Clara Braun designed the containers, for Alessi the inspiration for her design came from the images and objects she found during her travel in Italy.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item described below, circle the number that best describes the quality of the artefact. Use the rating scale to select the quality number.

"His sketches characteristically remind him of the old conches he used to read... design begins to get to his mind, and from the drawing, creatures emerge in lightest, dove-legged form."



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

Appendix D: Survey questionnaire - artefacts’ pool from Memory Containers and De/light Workshops

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

Su Fung's summer holidays were spent at her grandparents' house in Malaysia. The house had a huge garden and she had a warm memory of spending longer times in the garden under those large trees. The images shown are of her own experiences because the starting point of her design.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

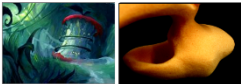
Kai Mei's memory of Indian stories were landscapes of lightness and happy times – she drew her stories and created the container that was ready to take off into her wonderful.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

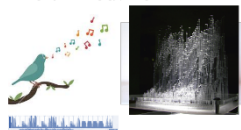
Xiao remembered the warm in the apple she ate as a kid, her wonderful sketch of that incident gave her the inspiration for her concept of a container.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

Yanying's Nightingale Lamp: This lamp takes Yanying's nightingale and every night it sings. It is night singing, light full of love, it touches something deep within, bringing joy and lightness!



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

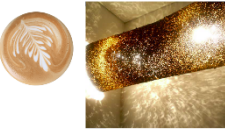
Seren's Night Drive: Night drive is probably when the deepest thoughts flow. Like a car driving on an endless highway, thoughts also travel. Under the magical use of colored lights, there is a calm, quiet and relaxed feeling. Serene always feel's like quiet calm when she looks out of the car on each drive. Inspiration "Night Drive" is lights in motion, capturing the emotions of the viewers, allowing them to experience serenity and calmness.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, please indicate how much you agree or disagree with the statement. Use the rating scale to select the quality variable.

Designs the warm coffee and aroma of cinnamon - Brian's lamp captures in a single moment the poetic potential of light and aroma of cinnamon.



	1	2	3	4	5	
Weak	☐	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	☐	Clean
Disgust	☐	☐	☐	☐	☐	Desire

Name: _____ Gender: _____

Expertise: _____ Years of relevant Experience: _____

Current Position: _____

Thank You for your time

Appendix E: Survey questionnaire - Artefacts’ with and without narratives from Cool Boxes Workshop

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.

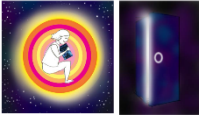
The visual impressions of his visit to IKEA became the intruded design idea of building near zero refrigerators - giving meaning and contextual richness in the form language, something essential to creating an original product.



	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.

The memory of carrying my first Blue Wave back on the flight was the design idea of creating this fridge - light gives it a sense of magic and wonder - the act of reaching for the food from this fridge an adventure...



	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.

Based on memory regarding an incident that took place on a road with some boys - the circle represents the playful and frolic nature of young blood. Orange also is the color of the youth, has been used with grey circles that are overlapping to create a sense of freedom.



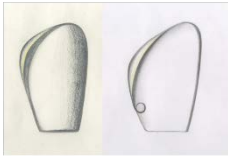
	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.



	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.



	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

QUALITY Scale Survey
For each item, I wanted to know: what is the number that best fits your judgement of its quality. Use the rating scale to enter the quality number.

The fridge that stands as a work from the workshop for simplicity and versatility.



	1	2	3	4	5
Weak	☐	☐	☐	☐	Strong
Static	☐	☐	☐	☐	Dynamic
Not Elegant	☐	☐	☐	☐	Elegant
Rough	☐	☐	☐	☐	Delicate
Monotonous	☐	☐	☐	☐	Varied
Boring	☐	☐	☐	☐	Surprising
Casual	☐	☐	☐	☐	Formal
Messy	☐	☐	☐	☐	Clean
Ungent	☐	☐	☐	☐	Desire

Name
Gender

Expertise:
Years of relevant Experience:

Current Position:

Thank You for your time

Appendix F: Survey questionnaire – evaluation with experts and target students

QUALITY Evaluation

For each item identified below, circle the number that best fits your judgment of its quality.
Use the rating scale to select the quality number.

Three Steps Narrative Process*
~ to Visualize Product Form ~

1	2	3
Share	Character	Visualize
Narrative	Attributes	Form

Poor

Excellent

1	2	3	4	5
---	---	---	---	---

General Impression	1	2	3	4	5
Improves the conceptualization process	1	2	3	4	5
Adds value to concept creation	1	2	3	4	5
Gives structure to the process	1	2	3	4	5
Improves communication	1	2	3	4	5
Builds confidence in their abilities	1	2	3	4	5
Aids in creating strong output	1	2	3	4	5
3 - step process is clear and beneficial	1	2	3	4	5
Use of narrative is a good way to realizing the product form	1	2	3	4	5

Are there clear opportunities to use the 3- step process specifically related to industrial design, which would improve the conceptualization process?
Please give constructive feedback and suggestions.

Name:

Current Position:

Appendix G: Product Meaning Approach. Allen's (1997) and Allen and Ng's (1999)

Routes of Human Value Influence on Product Preference		
	INDIRECT	DIRECT
	(via tangible attribute importance's)	
Product Meaning	Utilitarian	Symbolic
Content	Overt function and utility	Social categories and cultural principles (e.g., ideals, values, traits)
Location	Separate Tangible Attributes	Product Whole
Focus	Objective: product-focused	Subjective: self-focused
Breadth	Specific/Narrow	Abstract/Broad
Conceptual Clarity	Clear	Vague
Judgement Type	Piecemeal	Affective
Reasoning	Logical, comprehensive, and systematic attribute-by attribute analysis	Holistic, intuitive and approximate goodness of fit to exemplar
Memory Representation	Uncertain-perhaps verbal	Visual: multi-sensory imagery
Affect Latency	Delayed	Immediate
Affect Intensity	Low: evaluative	High: emotional states
Psychological Function	Instrumental	Expressive
Source of Benefit	The product's intrinsic qualities, means to an end, and ability to control the environment.	The use of the product as a vehicle for self-expression.
Motivation(s)	Need to competently and efficiently control and manipulate the environment.	Needs for self-consistency or social approval.
Product Identification/ Attachment	Weak	Strong

Table 1 Allen's (1997) and Allen and Ng's (1999) Product Meaning Approach: The product meaning, type of judgement and psychological function associated with the direct and indirect influences of human values on product preference.

Appendix H: Jerome Bruner's(1986) - two modes of thoughts

Table 1 Comparison of Bruner's two modes of thought

	<i>Logico-scientific mode</i>	<i>Narrative mode</i>
Objective	Truth	Verisimilitude
Central problem	To know truth	To endow experience with meaning
Strategy	Empirical discovery guided by reasoned hypothesis	Universal understanding grounded in personal experience
Method	Sound argument	Good story
	Tight analysis	Inspiring account
	Reason	Association
	Aristotelian logic	Aesthetics
Key characteristics	Proof	Intuition
	Top-down	Bottom-up
	Theory driven	Meaning centered
	Categorical	Experiential
	General	Particular
	Abstract	Concrete
	De-contextualized	Context sensitive
	Ahistorical	Historical
	Non-contradictory	Contradictory
	Consistent	Paradoxical, ironic

Source: Bruner (1986: 11–43).

Publication arising from this research

Sethi, S. (2018, July 23). Narratives as Design. *9th International Conference on Applied Human Factors and Ergonomics* . Orlando, Florida, USA: AHFE .

Sethi, S. (2015). Every Design Tells a Story. *ICERI2015 Proceedings* (pp. 6529-6535). Seville, Spain: IATED Publications.

Sethi, Simrun, & Sethi, Suresh.(2015). Every Design Tells a Story, Sustainable Future, Biennale 2015, Gwangju, South Korea.

Sethi, S. e. (2010). *V Light Shines\Light Reflects*. (S. Sethi, Ed.) Singapore: Nanyang Technological University.

Sethi, S. (2009). Memory Containers. *Integrity, Reliability and Failure - Challenges and Opportunities* (p. 421). Porto: INEGI- Instituto de Engenharia Mecanica e Gestado Industrial.

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I would like to thank the participating professional designers for sharing their experiences, narratives and their work. To my students in India, China, Singapore, and the U.S.A., together we went into this great adventure, of discovering the soul of design – the narrative. I take this opportunity to thank Professor Mohan Bhandari, Professor A. G. Rao, Andrea Branzi, Simonetta Ferrante, Virginio Briatore, Giovanni Levanti, for their friendship, the inspiration, the stories they have shared over the years, forming the ideas and ideals, it is this that has shaped my thoughts. I would like to express my sincere appreciation to Professor Abhishek Shrivastava, whose presence was invaluable.

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