University of Massachusetts Amherst

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April, 2016

Negative Capability in Design Studio

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NEGATIVE CAPABILITY IN DESIGN STUDIO

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"We are searching for some kind of harmony between two intangibles: a form which we have not yet designed and a context which we cannot properly describe."
Christopher Alexander (1964, p26)

Introduction

Most artists and designers will admit that some of their greatest innovations and achievements are the result of an accident. This fortuitous sort of accident however, typically happens only after an extensive period of trial and error. A seasoned designer knows that a certain amount of frustration and chaos must be endured in this process before such luck can be gainfully procured, but for students who are new to the design process, these states of confusion and unknowing can be unnerving if not intolerable.

Accidents are unintentional by nature; they happen unexpectedly, outside one's sense of control. The ability to perceive, think and function beyond a fixed capacity (or control) is also known as negative capability. The poet John Keats first used this term when trying to describe a person's openness or receptiveness to a reality that extends beyond the confines of his or her knowledge. Since then, the term has been appropriated by philosophers and other theorists who seek alternatives to the ongoing dialectic between structure and agency.

The concept of negative capability has a direct relationship to what design researchers Meinel and Leifer (2015, p. 4) refer to as The Ambiguity Rule, which states: *"Innovation demands experimentation at the limits of our knowledge, at the limits of our ability to control event, and with the freedom to see things differently."* As design educators, we can provide a structure or platform for students to experiment on their own, but how can we create a studio environment that encourages risk-taking, allows for error and teaches students to acknowledge and tolerate states of ambiguity; how can we teach them to hone their skills in negative capability?

Fail Better (Beckett, 1984)

Every year incoming university students show up to class ready to succeed, ready to follow the well worn paths to knowledge and ready to achieve, but rarely are they ready to fail. In fact the fear of failure can be so paralyzing that it can keep some students from making a dedicated attempt. In some ways this is no surprise, students are rarely shown examples of failures by well-known artists and designers don't often disclose their foibles. Resistance to failure is a natural component of healthy behavior, but in its extreme condition it keeps students from learning what is perhaps the most valuable of all lessons– resilience. And for the creative disciplines, which value divergent thinking, a certain amount of risk-taking is an essential part of the practice.

Setting a classroom environment that is both rigorous on the one hand and permissive on the other is not an easy task for instructors. Permission must be granted to make mistakes while maintaining the expectation for hard work, quality work and critical analysis. Initial discussions around

these subjects can help set the appropriate tone, one that normalizes accidents, mistakes and failure while it calls for diligence, insight and courage.

In 1973 artist Agnes Martin spoke to students at University of Pennsylvania about the importance of failure:

"I will speak later about successful works of art, but here I want to speak of failures. Failures that should be discarded and completely cut off. I have come especially to talk to those among you who recognize all of their failures and feel inadequate and defeated, to those who feel insufficient– short of what is expected or needed. I would like somehow to explain that these feelings are the natural state of mind of the artist, that a sense of disappointment and defeat is the essential state of mind for creative work." (Martin, 1993, pp.68-69).

She goes on to talk about the feelings of joy that come from an awareness of perfection in the mind– feelings that are connected to our experience of happiness and inspiration. But, she says, "we must surrender the idea that this perfection that we see in the mind or before our eyes is obtainable." In truth, the more we are aware of perfection, the more we realize how unattainable it is. That's why design is so difficult– one is constantly working through disappointments and failure to the point of defeat. "But still one wakes up in the morning and there is inspiration and one goes on", Martin assures us. As one accepts failure, there must still be a determination to continue.

Reading and discussing these ideas in class can help set a tone for hard work and experimental trial and error. It sets an expectation not only for failure and defeat, but also resilience and tenacity. And beginning designers need to be prepared for failure if they want to achieve success later on. This paper outlines three strategies for teaching risk-adverse students in order to help them understand and endure the nature of ambiguity in the design process. The first two assignments, which were developed for first-year foundation level students, emphasize improvisation while they investigate unfamiliar modes of perception. The diversity of outcomes from these activities confirms the substance of individuality and can help teachers determine the best way to accommodate different learning styles. The last example (Leap Across Gaps) is a semester long project designed for second-year architectural design students and focuses on representational translations in space.

I. Draw with Closed Eyes

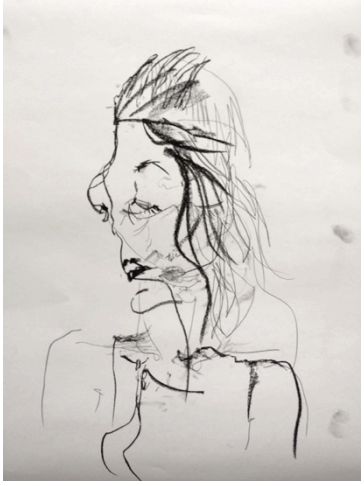
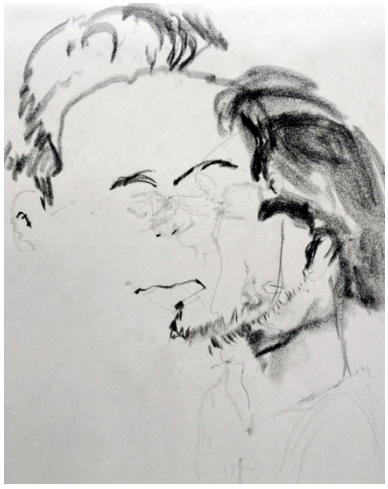
First year design classes typically offer highly structured assignments, many of which are meant to breakdown students' preconceived notions of perception and representation. The emphasis in these assignments is on investigation and exploration rather than instruction. In other words, a limitation is prescribed, one that is often perceived as insurmountable, and the main goal is to initiate a process of discovery and invention. Blind contour drawing– or "pure contour drawing" as it was first popularized by Betty Edwards (Edwards)– is a method that prohibits the artist from looking at the paper that they are drawing on.

Numerous variations of this assignment exist. The two outlined here focus on selective observation and touch. Both assignments are self-portraits, the first asks students to look in a mirror and draw what they see without looking at the paper. Students must keep their eyes on the mirror and move their pencils continually on the page for 20 minutes. Some students use a draped piece of fabric or paper to help eliminate the temptation to look. Predictably, 20 minutes feels longer than expected, so students are encouraged to draw slowly and deliberately, taking their time to discover new and unexpected features. While the students are drawing, its important to emphasize that for this particular exercise, **observation is more important than representation**.

With pencil and paper ready, the second assignment asks students to close their eyes entirely and draw their face by touch only, so that one hand is drawing while the other hand is feeling the shapes, features and textures of the face. Once again they are asked to do this for up to 20 minutes,

taking their time to feel not only the haptic features of their face but the tactile movement of their drawing utensil and paper.

The initial frustration of not seeing their drawing in progress, usually subsides as students begin to concentrate on the task at hand. Once a student starts to loose self-consciousness and surrender to the process, some remarkably original and creative results can occur. Below are a few examples of blind drawings that illustrate the openness of forms and variation of marks that typically result from this assignment. Students are quite amused when they first see their blind drawings, surprised at the unexpected results. But there is also a dissociative pleasure that can occur– the realization that something quite out of the ordinary, and beyond expectation can be created when one is willing to let go of intensions and become immersed in a process with careful attention.

Drawing with close eyes

After pinning the work up for review, instructors can recognize the individual styles for learning and expression. The perfectionist will typically use smaller, lightweight lines, with an approach that is dominated by hesitation, risk aversion, neatness and calculated precision. The expressionist will employ larger heavily weighted lines and marks that have a wide range of diversity. Their approach is more spontaneous, bold and muscular. Both styles have something positive to offer, and both have something to glean from the other. Understanding these differences can help instructors tailor their feedback to the needs of the student.

Students may not see the value in these awkward blind drawings at first, so it is important to point them out. Identify the difference between open and closed forms, for instance, and variations in line quality and fluidity. Draw attention to the expressive moments that can happen unwittingly and remind students that some of our greatest discoveries and inventions are the result of an accident.

II. Play with Objects

According to the architect Yona Friedman (Obrist, 2007, p. 62), *"Intelligence starts with improvisation."* It is this act of uncertainty that prompts the vigilant search through complicated arrangements and situations. Getting students to improvise in beginning design classes can be challenging, especially with young adults who harbor self-conscious inhibitions. Exercises that take the form of a game break down inhibitions while they facilitate engagement and collaboration. In this way games are useful in foundation classes.

In this assignment students are asked to revisit the classic childhood pastime– playing with blocks. At the beginning of the semester, students are asked to fill a shoebox with regular and irreg-

ular wooden blocks, panels, rods, and found objects. It is important that the materials in the box are modular and reconfigurable. Other than that the only rule is that some of the blocks be the same size and all the materials fit together neatly in the box. The course it is developed for, *Introduction to Architecture Design and Graphics*, teaches students principal architectural drawing techniques and creation in space. This eclectic kit-of-parts is used throughout the duration of the course to teach the students about composition, representation, drawing systems and design thinking.

Using this kit-of-parts, collaborative warm-up exercises are structured to initiate communication and exchange between the students. The task is straightforward: on a 18x24" sheet of paper, create a sculptural composition with your kit that explores the elements of composition (solid-void relationships, repetition, balance, tension, focal point). Once this is constructed, students swap places with one another to respond, revise and rearrange their peer's piece. This continues until each student moves at least five times, providing multiple opportunities for improvisational revisions.

Examples of configurations made with a kit-of-parts

The act of playing is an essentially pleasant, engaging experience, but it can also be precarious and full of risk. For small children play comes naturally and usually involves the body and the manipulation of objects in space. The risks on a playground are mostly physical and emotional. As one matures, language and other complex instruments enter the playground and the risks become more social and psychological– there's the risk of being misunderstood, the humiliation of defeat, or the embarrassment of undue exposure. But when one is subsumed in the act of playing, no matter what the age, inhibitions tend to fall away as a sense of freedom, spontaneity, and possibility unfold. At least this is what one hopes for. Returning to a childhood pastime with the inquiring mind of an aca-

demic can help students rediscover the moments of creativity and invention they enjoyed as children, giving them access to their inherent capacities as adults.

III. Leap Across Gaps

Second year university students begin to develop visual communication skills and more confidence. But the design studio continues to be full of risk and uncertainty, as it should be. This next semester-long project, first developed by Sigrid Miller Pollin in 2005, begins with a handshake and ends with a building design. For most students, this is the first class in which they learn how to translate art and forms into architecture and buildings. The semester is organized into five projects that are sequential and conceptually linked. At each juncture, students must leap across a gap of **not-knowing**.

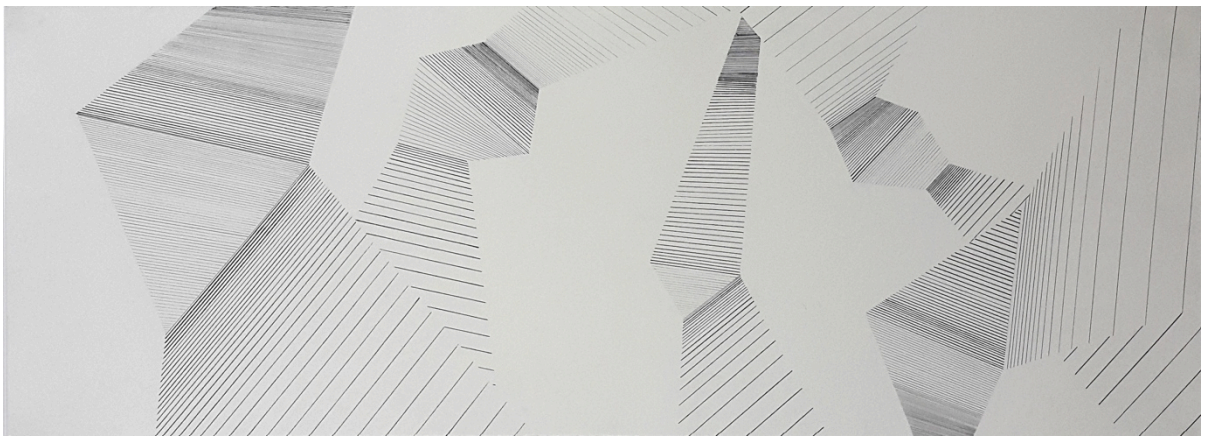
1. The Handshake

After researching the photography sequences of Edweard Muybridge**,** students are asked to choose a partner and choreograph a handshake that they must then document with a series of photographs. With this everyday symbolic gesture, students pay attention to the way social interaction occurs as movement through space. After the sequence is composed (some of which are quite fancy), teams partner with other teams to share and document the handshake sequences they've created. Once the series is printed and hung, students present their series along with an articulated term that describes their **relational concept**, such as interlocking, intertwining, compression, extension, joining,etc. These concept terms have great importance because they anchor the student's investigations throughout the semester.

Detail of student handshake series.

2. The Dynamic Drawing

In the next part of the project, students are asked to work individually to translate the handshake series into an abstract *Dynamic Drawing*. Here they are introduced to the first leap– how to translate familiar objects moving through space into an abstract drawing that communicates their conceptual term. The important part of this exercise is to encourage students to think abstractly about form– to extract a geometrical form out of a representational image. For reference, they are shown examples of the early 20th century cubist artists– like Braque, Picasso and Gris– who were fascinated with the possibilities that exist between time, space and the 2-dimensional image.



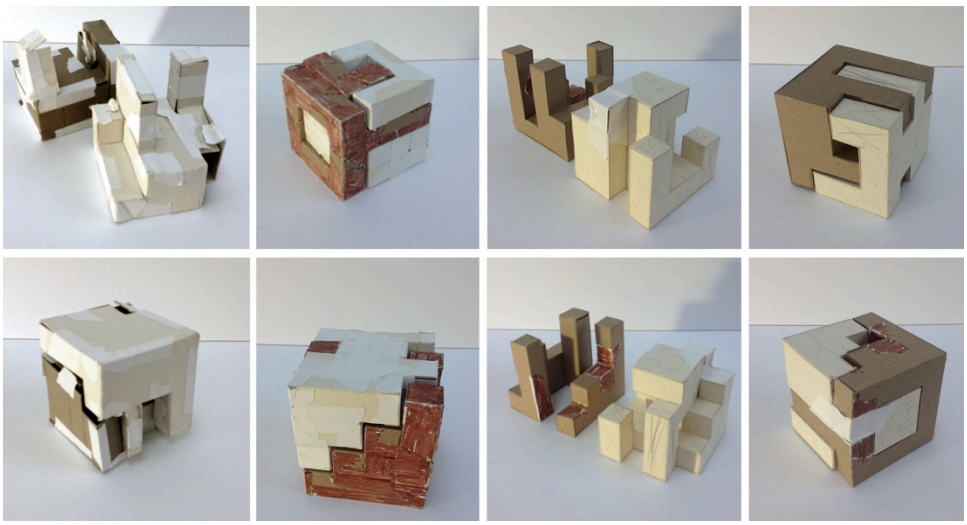
Dynamic Drawing, by student, Benny Yeo

3. The Duality Cube

The next leap is a big one. The students– having distilled time, movement and space in to a 2 dimensional abstract drawing– must translate (or interpret) their drawings and concepts into a 4x4x4”orthographic cube using two different materials. The two materials must be formed into two masses that can come apart and fit together– much like the original handshake. This cube explores the formal relationships between two common building materials– concrete and wood.

To begin this leap, students are asked to make 3D sketches. The guidelines for this step are explicit: “the two materials should be 1/16”, 1/8” or 3/16” thick board materials (chipboard, cardboard, butter board). Although one material may dominate the model, the maximum difference should not be more than 60/40. All forms should be orthographic. Two voids (or more) must be incorporated into the cube. If possible, these voids should play a role in the overall meaning/ideas you are exploring on this project. One void should engage an outside plane and the other void should be inside your form (buried or hidden). They may be connected or autonomous, similar-sized or different. The voids should not be smaller than 1”. Create at least 2 study models. These study models should be made quickly. They may be held together with white glue or tape.” (Miller Pollin, 2005)

The objective for these study models is to quickly discover potential configurations. There are many entry points for this translation. For instance, students can photocopy their *Dynamic Drawing*, cut it into 6” strips and begin to wrap it around a cube to see what ideas emerge. Or they can return to the photo series of the handshake to look for ideas about creating a joint relationship between differing materials. In all cases the concept idea that came from the photos and drawings (ie. intertwining) are meant to guide the process.



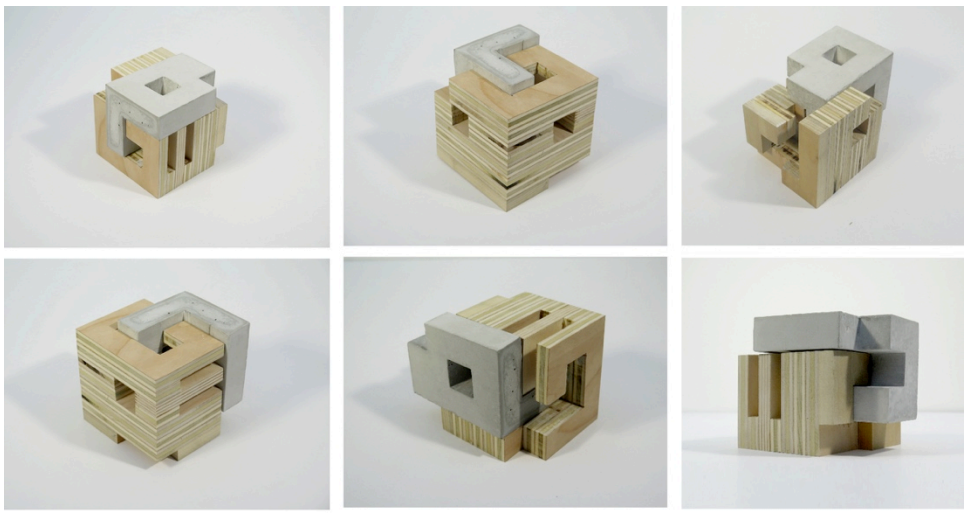
Duality Cube: showing progress of 3 sketch models from left to right. By student, Coleman Barnes

Although the guidelines for this assignment are very prescribed– with specific materials, dimensions, and requirements– many students still find this step difficult and confusing. Invariably there are those who want to know the correct way to do it. But as a problem with multiple (even infinite) solutions, and there is no one correct way, and each person will resolve it differently. Here the students must teach themselves how to do it through trial and error. They must wander intuitively from a place of **not knowing** to finding a form which can then be considered, rejected, revised or further developed. This place of not knowing is what the poet, John Keats (1877, p277) refers to as "Negative Capability, that is, when a man is capable of being in uncertainties, mysteries, doubts, without any irritable reaching after fact and reason." It is this receptive and searching state of mind that leads to innovation and discovery beyond one's knowledge or perceived capacity.

As students find their way through this step, it is important for them to receive feedback and guidance not only from the instructor, but also from their classmates. Students learn the most from seeing the various ways their classmates tackle the problem. The early, rough unresolved sketches have as much to reveal about process as the more polished models. Here students experience first hand that good designs can emerge from not-so-good designs, and great designs can come out of those that are mediocre. This is an important point to emphasize because many students get frustrated if their models are not working well. Some feel exasperated over having to make and re-make models and drawings. They feel they have already made a decent sketch and that it is enough. What they need to understand is that great designers revise their ideas and models over and over and over again. It is through this revision process that one begins understand why certain designs work or don't work. This is a kind of knowing that can't be learned any other way; it cannot be taught, described or formulated– it must be experienced and weighed by each individual maker.

4. Rockite and Wood

Before the students move on to the concrete/wood edition of their cube, they are shown exemplary projects from previous years and asked to rethink their models. More advanced students who have completed this course are invited to come back and share their knowledge from past experience. This includes giving a demonstration of mold-making for the concrete (Rockite) and some tips on crafting the wood to fit into the concrete. In the end, students who have taken the opportunity to revise their ideas in the previous step, typically make projects that are more interesting, complex and well thought out.



Finished concrete and wood cube, by student, Brian Turner

5. The Program

The final leap integrates and transforms the cube into an architectural model and design. Here students are given a detailed program and asked to translate their cube into a design for an artist's studio and gallery. As they continue to explore the interplay of dualities—two forms, solid-void, two materials, two qualities— they learn to link concept, form, program and material. Once again students are given explicit guidelines for the assignment and once again they begin the process with sketches and study models. The cube acts as a foundation for their designs as they translate the material and spatial configuration to accommodate the program. Students are allowed to take liberties in the translation of the cube to a habitable space, but the overall composition of the design must be consistent with a single configuration of their cube's into two parts. For their final evaluations students must present a ¼" scale model of their design along with plans, elevations, sections, interior views, light studies, and a concept statement.

Students begin this task by exploring the various interconnected configurations for the two parts of their cube. The goal for this project is to find an appropriate spatial configuration for the program that best expresses their **relational concept** (ie. intertwining). The designs they come up with are meant to build on the insights of earlier projects while they explore the qualities of material and light. It is a rigorous and demanding task to finish all the requirements in the allotted time. Students learn how to think spatially as they translate their designs between two and three-dimensional representation.

At crunch-time, students feel pressure and stress that they won't be able to complete the requirements on time. Some express over-whelming feelings of frustration, confusion and dismay– at which point they should be reminded that perfection is not expected, that perfection is unattainable, and that they should improvise to the best of their ability. In this way they can receive useful and timely feedback that will help their projects progress.

Finished model for final presentation, with light studies. By student, Benny Yeo

For the final reviews, students present their sequential explorations from the entire semester, including process sketches and models. The projects vary in comprehensive quality. Often there is a wide range in quality within one student's presentation. A project with an outstanding model, for instance, may present weaker drawings, while one with exemplary drawings may have a less developed model, but a wonderfully articulated concept statement. Because the task is so demanding for the allotted time (about one month), students must decide how and where to focus their energy. What is most important is that they can see for themselves how design can begin with something as simple and ordinary as a handshake and end with a design for a habitable building; how forms and concepts can be extracted from one thing and transformed into another. They also recognize the ability of a building design to extend and express relational concepts like intertwining, compression, or joining.

Conclusion

The assignments outlined above are presented for educators who are interested in creating a studio environment that values inquiry over knowledge. Like many studio assignments, they have evolved as they're passed down from one teacher to the next. By nature, they are meant to be adopted, shared, revised or reworked. As the editors of Paper Monument point out:

"There can be legendary assignments, attributed to legendary teachers, but few people would consider it improper to re-use them. Just like the jokes that assignments sometimes resemble, a lot depends on the telling. Likewise, if assignments are like prescriptions or recipes, it's crucial to know what the ailment is or who is coming for dinner." (Petrovich and White, 2012, p122)

Draw with Closed Eyes; Play with Objects; Leap Across Gaps– these are all calls for action that involve risk- the risk of loosing control, the risk of judgment, the risk of making mistakes, of rejection, of failure or absurdity. As such, these calls for action are good prescriptions for risk-adverse students. Being a perfectionist certainly has its advantages, especially in the final stages of design, but in the beginning stages, the expectations a perfectionist harbors can hinder the creative process.

The first exercise forces students to let go of perfection, to close their eyes to what they know they can do and pay attention to alternative modes of perception– like touch, movement and spatial flow– revealing how innovative and original creations can result from unintentional actions. The second revisits a playful childhood pastime, reminding them of their innate creative abilities. This cultivates a climate of experimentation and collaboration in the classroom. The third example benefits

more experienced students, challenging them to leap across the interstitial gaps of knowledge and instruction. It promotes trial and error, which is the fundamental method of solving problems through repeated, varied and failed attempts.

One should not expect to play beautiful music the first time an instrument is picked up. Likewise, students should know they are not expected to create a masterpiece, at least not in the beginning. And they should be open to accidental discoveries along the way. Together these projects help teach students the benefits of negative capability in studio environments. They show that control, assessment and judgment need to be suspended in the early stages of design for divergent thinking to manifest. Most importantly, they can help students understand and accept that uncertainty and failure in the design process is not only inevitable, but one that is integral to creative practice.

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