Mastering the Fundamentals of Design Thinking by Teaching the Skills of Improvisation

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Abstract This chapter makes the connection between design thinking and improvisation and the skills required by each discipline. Further, we make the argument that the skills needed for successful design thinking and effective team interaction can be taught and that improvisation is the perfect medium for teaching them. We offer simple, practicable exercises that teach fundamental design skills like flexibility, risk taking, careful observation, and building on the ideas of others.

1 Introduction

Design thinking and team-based design rely heavily on flexibility, creativity, and risk taking. These skills are buzzwords in business, education, and in almost every other industry. Creative problem solving is deemed one of the most important skills necessary for success in the workplace and in life. Design thinking and team-based design are *built* on flexibility, creativity, and risk taking, which raises the very important question: How do we teach these skills?

This chapter explores the connections between improvisation and team-based design and suggests improvisation exercises that teach specific design-related skills, giving design practitioners and educators a foundation for teaching and practicing fundamental design skills.

Design thinking has been defined as an iterative, user-centered approach to solving complex problems. Improvisation, or improv, can be defined as the ability to improvise or act without a script, or, to make things up spontaneously, using the people and things available to you. We can use the principles of improv to teach the skills needed in design thinking, making them accessible and easy to practice.

In design thinking, teachers and coaches encourage teams to "be creative", "take risks" and "build on the ideas of others" but they rarely tell them *how* to perform these behaviors. Telling a designer to "be creative" without providing the mechanisms for doing so, is like a sports coach telling an athlete to "run faster." Athletes practice drills

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for successful performance just as musicians practice scales. The same holds true for designers: in order to excel at user-centered design, we must first teach designers the skills and drills needed for successful performance. Improvisation relies on many of the same skills as design thinking and has proven to be an extraordinary vehicle for teaching these skills. Repeating the exercises and practicing the skills of improv gives the designer a "road map" to follow—a practical guide to navigating the unknown (Talbot, 2022).

The benefits of improvisation have been widely recognized by businesses, industry, and academic institutions. Companies like Google, Siemens, and IBM use improvisation for promoting innovation and improving team dynamics, and graduate schools like Harvard Business School, MIT, and Stanford, have made improvisation a part of their curriculum.

2 Training Improv Skills for Team-Based Design

One of the fundamental concepts in design thinking is the notion of "building on the ideas of others." In order to build on someone else's ideas, we must first listen to their ideas. Active listening is a skill. It involves more than just perceiving sound. It requires our full attention and letting go of one's own agenda. It involves trust. Improv helps us develop this ability to listen attentively, to observe, and to promote empathy. Teaching us to say "yes," to our teammates' suggestions, asks us to be accepting and non-judgmental, thus promoting open-mindedness and collaboration. Improv encourages us to take risks, thereby helping us to become more flexible and less afraid to fail. It teaches us to make useful "offers" or suggestions that our teammates can build on. It teaches us to let go of our preconceived outcomes, opening us to discovery and innovation. These are valuable life skills, business skills, and problem-solving skills. They are the fundamental skills of team-based design.

When combined with design thinking as a way of solving problems, improv can be the key to successful innovation and creative solutions because it gives students actual practice learning the skills they need to succeed. It takes the mystery out of successful design and design thinking by giving us methods for learning these skills and an opportunity to practice them.

3 Improvisation and Cognition

In good design, we are never just designing an object by itself. We are always creating something in relation to the objects or people around it. We are creating both the *experience* of using or engaging with the object as well as *the story* that goes along with the object. When we design a new pen, we are designing the experience of holding and writing with that pen. We are creating the story of a user using that pen in a variety of situations. If done well, we are *envisioning* and *enacting* the story of

our object being used. We make the story come alive in our bodies, not just in our heads, in our imaginations. This kind of "thinking with the body" is what researchers call "extended cognition" and it is a hallmark of high-performance teams.

We tend to think of cognition, or thinking, as happening mostly in the brain. However, research has shown that we think with our bodies and with things as well. Thinking with our bodies and interacting with the objects around us actually *helps* us think. When we think with "things," holding them in our hands, using them, and when we think with our bodies, acting something out, pointing, gesturing, pantomiming, we think better, faster, and more creatively (Kirsh, 2011; Tversky, 2019). In short, the combination of mind, body, and objects actually enables cognition.

If thinking is enhanced by engaging on these three levels: mind, body, and with objects, how can we practice this kind of engagement and thus train ourselves to think more creatively? Improvisation involves the body but also happens in the mind and in relation to other people and things around us. Improv operates on all three of these levels, often at the same time. It allows us to switch easily between body, mind, and object and to explore the interplay between them. Improvisation gives us a way of practicing different kinds of thinking, and "extending" our cognition, and it gives us a practical way of teaching students to do the same.

Another area of cognitive research that is relevant to the design process is *distributed* cognition, or problem solving distributed within or across the group (Hutchins, 1995). The nature of improvisation is spontaneous and unscripted. No one knows the outcome of an exercise or a scene at the start. We only know our individual parts. The same is true in design. When we are working on a design challenge, no one knows what the final outcome or solution will be. It emerges as a result of individual efforts. Becoming comfortable with only knowing our individual contribution and relying on team members to complement our contribution is a lesson in trust. Each team member brings his or her unique skills and point of view to the process, such that the whole is "an intersection," not just the sum, of the individual parts. When done well, distributed cognition can take a team from "coordinating" to "collaborating," that is, from merely working well together into the realm of discovery and innovation (Leifer, 2005).

4 Designing the Story

In improvisation, we are continually building on what has come just moments before. We create the story moment by moment, allowing it to unfold, piece by piece. Recognizing and learning to "build" on individual pieces and weaving them into a compelling narrative is also the job of the designer and design thinker.

There are many improv exercises that teach the skill of story building. In the exercise "Questions Only," two people build a scene or a story by alternating one line at a time. But unlike "One-Word Story," where we build a story by adding one word at a time, or "One-Sentence Story", where we alternate adding one sentence at a time, in this exercise, we are only allowed to ask questions.

When playing "Questions Only", we would give two "players" or volunteers a made-up relationship and a situation, for example; "siblings at their sister's wedding." Player One might start the exercise by saying, "Can you believe our sister is getting married?" Player Two might respond, "Do you think she'll really go through with it?" To which Player One might say, "Why? Do you think she knows about the affair?"….

This exercise can be incredibly challenging. We often disguise statements as questions, thinking we are asking something when we are really providing information, usually to further our own idea of where the story should go. We want to answer the question. Designers have the same tendency. We want to solve the problem. We often resist staying in the "question space" and are eager to jump to the "solution space". However, there are many benefits of staying longer in the "question space" including opening up to a greater understanding of the problem.

The Quaker religion has something called a "clearness committee," which helps anyone in the community find clarity when faced with a big decision. Rather than try to solve the problem or offer advice, the committee has one rule: "ask questions only." The idea is that by asking only questions, the committee seeks to listen and to help the person seeking clarity, to listen. Contrary to our culture of wanting to fix things and offer solutions, the "clearness" process assumes that we provide more help by listening than by "fixing" (Levoy, 1997). It suggests that asking questions and listening attentively leads to solutions.

Asking the *right* questions helps us formulate a good story. Researcher Ozgur Eris describes two types of questions necessary for informed design, DRQs or Deep Reasoning Questions, and GDQs, Generative Design Questions. DRQs ask about specifics: how big something will be, where the buttons will go, what material it will be made of. Deep Reasoning Questions are concerned with specifications, comparison, and verification. Generative Design Questions, on the other hand, help us to generate, asking questions like, "What if we made it out of this? What if we changed the shape or material?" Because these two types of questions do very different things, we would therefore want to use them at different stages in the design process. The most effective teams know when to ask which type of question and how to move easily between the two types (Edelman, 2011; Eris, 2003). Improv exercises like "Questions Only" can help designers recognize the different types of questions and become adept at utilizing them appropriately.

5 Re-thinking the "How Might We" Question

In design thinking, we often use the technique of asking "How might we…?" questions (HMW) as a way of generating possibilities during ideation. However, "How might we" questions are actually *not* generative questions. "How might we" questions are really deep reasoning questions disguised as generative questions. By their very nature, they seek a specific answer. "How might we do such and such…? We do it like this…" The moment these questions are asked they move us immediately from exploring the problem to finding possible solutions. What if we reframe the

HMW question as a "What happens if…" question? "What happens if" is a generative question. It seeks to open the space, it asks for possibilities. It asks for more. It takes a risk. "What happens if" questions get us comfortable with staying in the "question space." When proposed by a teammate, "What happens if" is a suggestion, an "offer." We can practice building on our teammate's ideas by building or adding to their scenario. We build on their ideas by asking generative questions and lingering in the question space. Ask "What happens if…" questions, then play out the scenarios—enacting them in the body, the mind, and with objects.

6 Teaching the Core Skills

This section focuses on several skill sets necessary for good team-based design: careful observation, deep listening, and empathy, as well as building on the ideas of others, flexibility, collaboration, and trust, and finally synthesizing information, telling a good story, and taking risks. Specific improv exercises aimed at developing these skills are described in detail, as well as notes for reflecting on the exercises.

7 The Basic Rule

There is one basic rule in improvisation, "Yes, and." Whatever your partner or another player says or does, you say "yes" to it. You accept all "offers," (that's the "yes") and then build on that offer (the "and"). Every suggestion, idea, or outrageous statement is met with an enthusiastic, "Yes!" even if they ask you to let go of what you had planned. Letting go of pre-conceptions is another essential skill for designers. Staying open to possibilities, resisting stereotypes, seeing things from a new and varied perspective are all ways to build the trust, cooperation, and collaboration necessary for teams, students, and businesses to succeed.

Saying "yes" and accepting your partner's offers shows you are listening, you are validating their suggestions. This makes your partner feel and look good. Then when you make an offer they say "yes" to your idea, making you look and feel good. This leads to another rule of improv, "Make your partner look good". Del Close, one of the early founders of modern improvisational theater, said, "If you want your partner to be a poet and a genius, then be a poet and a genius." (Salinsky & Frances-White, 2008) It is much easier to come up with good ideas when all of your ideas are received enthusiastically. Focusing on your partner also keeps you present at the moment, gets you "out of your head," and takes your attention off of yourself and what you will say or do next.

In improv, we are taught to accept every offer or suggestion, but not every offer is a "good" offer. A good offer, in improv and in design, is one that propels the story forward, offering something in addition to, or "more than" what came before. Through practice, we can learn to turn a "weak" offer into an offer our teammates

can use and build on, an offer that contributes something, risks something. It's how we begin to develop the skill of risk taking.

8 A Few Notes on Improv

Improvisation is fun, so learning these skills is also fun. Improv requires no previous knowledge and very little preparation. It is flexible and can be done almost anytime, anywhere.

Improv involves the whole body. It can help us practice embodied cognition, enabling us to think "better, faster and more creatively" (Tversky, 2019). Additional research on what makes a successful team and on ways to increase team efficacy shows that embodiment and gesture correlate with successful team interaction (Edelman et al., 2019). Improv is one way to become more comfortable with embodied movement and gesture.

9 Making Mistakes

Improv, like design thinking, is about doing. In design thinking, we "do to know," prototyping quickly so we can test our idea and see if we're on the right track. By making "mistakes" we learn from our "failures." In improv, because there is no script, we also have to act quickly. We learn to act on instinct regardless of the outcome. Improv exercises are designed to get us "out of our head." They're fast-paced and unpredictable.

Learning to "jump in" without thinking trains us to take risks and face our fears. We become willing to fail, and we get comfortable making mistakes. In improvisation, there are no mistakes. Everything is useable. In improv, mistakes are often celebrated with applause. With practice, we can become skilled at seeing "mistakes" as a challenge, an opportunity.

10 Teaching the Skills

Throughout this chapter, I use the term students, participants, or players to refer to those who are learning the improv exercises. These could be adults, children, or professionals. When teaching adults, I have found that most prefer the security of knowing what they will be doing before they do it. They often want to discuss and analyze the exercises before trying them. Instead, have them try the exercises first. Defer questions and observations to the end.

Conduct a brief reflection after each exercise. Ask the students what they noticed or learned, and see if they can name some of the skills used in the exercise and their

relevance to team-based design and to life. The reflection period is like synthesis; it's where we make sense of what we just observed or experienced. It's often where the real insights occur.

11 The Exercises

"Mirroring"

One of the simplest exercises for developing observation skills is the "Mirroring" exercise. The goal is to develop deep observation skills by teaching students to look carefully and pay close attention. It's like "deep listening" with the body.

Playing the Game

Have students form two lines facing each other, pairing up with the person opposite them. (If there's an odd number you can step in). Have them decide who will lead first. One player leads and the other "mirrors" them simultaneously. Switch leaders after a minute or so. You can make suggestions about varying the speed or using all parts of the body, including the face.

Reflection

Almost always, one group will say that there came a point where they were so "in synch" with each other that neither person was leading or following, they were acting in unison. Although this is not the goal of the exercise, it shows how carefully they were observing each other so as to seem to be moving together seamlessly. As the facilitator, you can ask what other skills this exercise develops. Some of these skills are empathy, focus, being present, slowing down, paying careful attention, working together, cooperation, and getting "out of your head."

How It Relates to Team-Based Design

The skills taught in the Mirroring exercise can be helpful in several phases of a design challenge. These phases are "understanding" the problem, because of empathy and teamwork, "observing" by looking carefully and noticing and especially in "synthesis," where being "in sync" with our user and seeing things from the user's point of view (empathy) is key to successfully making sense of our findings.

Additional exercise: "**Change Three Things**"

"Change Three Things" is another improv exercise that helps develop observation skills. It can be done using the same set-up as mirroring (two lines, partners facing each other) and is often a good warm-up to start a session. Partners take a minute or so to "study" each other, paying careful attention to details. Then they turn back to back to each other and change three things about their physical appearance (rolling up their sleeves, taking off glasses, etc.) When both partners are ready, they turn back to face each other and take turns trying to guess the three changes. It's good to do a

second round as the players get more confident and the changes become more subtle and harder to detect.

11.1 "Yes, And!"

Listening well requires putting all of your attention on the other person and letting go of any thought about what you're going to say next. This requires a great deal of trust. Trust in your partner and trust in yourself that when it comes times for you to speak, you will know what to say. It requires you to let go of any preconceived notion of where the story or the idea should go. Saying yes to your partner or teammates says, "I hear you. I'm listening" and "What a great idea!" The "And!" says, "I like your idea and I'm going to build on it." Accepting someone else's ideas gives them permission to take risks by releasing them from the fear of saying something wrong, or failing. It builds cooperation and trust, freeing other members of the team to take chances and to trust their instincts. "Yes, And!" is used frequently in business for brainstorming and team-building, and in design thinking in the "iteration" phase.

11.2 Playing the Game

This exercise is usually played in three rounds. However, if time is an issue, you can skip to the third round, "Yes, And!" Give the instructions for each round just before the round, so there is no planning ahead or trying to "figure out" the exercise. Have the group split into pairs or 3's. Suggest an activity that they will plan together (a surprise party, vacation, company picnic, etc.).

As the facilitator, you can pick someone from each group to go first (or come up with a fun way of deciding who will start, for example, "whoever is taller" or "whoever is not wearing black"). In the first round, instruct the players to say "no" to every suggestion. The first player starts with what they are going to do and the other player, or players, respond with "no" and make another suggestion. Let the players know they have permission to really discount the idea. They take turns coming up with and rejecting suggestions. For example, if we decide the activity is to plan a retirement party for our boss, the first round might sound something like this:

Let's have a surprise party for our boss and invite the whole company!

No. That would be way too expensive. How about we take her to dinner with the team?

No, she doesn't even like us. We should get her something, like a watch.

No. Watches are stupid. No one even wears watches anymore.

In the second round, players say "yes, but…" It might sound something like this:

For the party, everyone could prepare a little rhyme about our boss.

Yes! But you never know what people might write. What if we do a skit?

Yeah, that'd be so cool, but it would take a lot of planning. We could hire a band?

Yes, music would be great, but a band is so expensive!

In the last round, players say "yes, and!" to every suggestion. They respond enthusiastically to the idea and then build on or add to it. Remind the players to "accept" whatever their partner suggests.

The third round might go something like this:

Hey, why don't we have the party on a boat, like a dinner cruise?

Yes! And we could hire one of those giant cruise ships with basketball courts and swimming pools on the decks!

Yes! And we could stay overnight on the cruise ship, with every employee getting their own Presidential suite!

Pitfalls: Besides trying to be clever or funny (which usually means not really listening to your partner), there can be a tendency with the "Yes, And!" round for players to just list a bunch of ideas. This kind of associative list is usually related to the topic but doesn't build on the previous idea. One reason brainstorming often fails is that it generates a "laundry list" of suggestions that lack depth. Remind the players instead to really engage with their partner's suggestion, expanding on and adding to it. This is how we can turn a weak offer into a more useful offer and how we can "stack the deck" for distributed cognition, with each individual contribution building upon the one that came before.

11.3 Reflection

After all three rounds are finished, ask the players what they noticed about each round. Usually, players either love the "no" round, because it gives them a chance to speak in a way they never would, or they hate it because it doesn't go anywhere and no one is really listening to each other. If players don't come up with this insight for the "yes, but" round, you can make the point that "*yes, but*" is really a "*no.*" Even though you have said "yes," in effect, the "but" renders it a "no." In the third round players usually get very excited, the volume in the room goes up and there is often a lot of animation and gesturing, a good sign that players may be moving into a new level of awareness, that is, embodied or extended cognition (Edelman, 2019).

11.4 How It Relates to Team-Based Design

"Yes, And!" is often used for "iteration" or idea generating. Saying "yes," supporting your teammates, and building on their ideas is helpful throughout the entire design process.

11.5 "What Cha Doin'?" (Aka: What Are You Doing?)

This is a great exercise to warm up a group, especially if they are nervous about improv. The point of the exercise is to "mis-name" or "get it wrong" so no one has to worry about "getting it right." It is also physically active so good for getting people moving and it is always a lot of fun.

11.6 Playing the Game

I like to do this exercise in a circle with the whole group because I think there is much to be learned by watching other players. It can also be done in pairs or smaller groups. Players form a circle. Decide who will go first and in which direction the game will go. The person who starts begins by pantomiming an activity, like brushing their teeth. After watching for a few seconds, the person next to them asks, "What cha doin'?" They can join in the pantomime while they are observing if they want. The first person responds by naming an activity completely different from what they're acting out, like "I'm doing yoga." The second person begins pantomiming the answer, in this case, they do some yoga poses, as best they can. Then the player next to them asks, "What cha doin'?" Rather than say, "I'm doing yoga" they respond with something unrelated, like, "I'm changing a tire." And so on around the circle.

11.7 Reflection

This exercise operates on all three levels of extended cognition: thinking with mind, body, and objects around us. In addition to thinking with the body by physically enacting an activity, there is an "implied" object or objects with which we are interacting, and we are also thinking with our mind and communicating with language. It is here that this exercise operates on another, much deeper level. By acting out one thing but calling it something else, we are challenging our usual thinking process. We disrupt the connection between things and what we call them, essentially giving us a new way of looking at something, a fresh perspective. This disruption lays the groundwork for the subsequent "re-naming" of these objects. The re-naming of objects, interactions, and experiences, is an advanced design skill linked to highly effective teams (Mabogunje, 1997). Seeing beyond our limited notion of what something is, seeing a chair as "not just a chair" or "more than what we think of as a chair" is an invaluable skill for designers and educators alike. It allows us to imagine what could be, what is not yet in existence—a necessary skill for radical innovation.

11.8 How It Relates to Team-Based Design

This exercise can help us with " synthesis"; the ability to recognize patterns, put things together, and make something new. It is also good for developing "observation", "understanding" and "ideation."

Additional exercise: **"Mis-Naming Objects"**

Another exercise for practicing the advanced design skill of renaming, is called "Mis-Naming Objects". In this exercise everyone walks around the room, points at random objects, and "mis-names" them out loud, all at the same time. It is much harder than it sounds to separate what we call something from what it actually is. However, breaking this association is crucial for the designer if we want to redesign anything.

12 We Are All Improvisers

We are all improvisers. None of us knows what will happen next and life does not follow a script. We have all had to deal with failure or the unexpected. Improvising is a part of life. Improvising "*well*" is a skill that can be taught. Practicing the skills of improvisation lays the foundation for mastering the skills of team-based design, helping us to become better designers and greater agents of change.

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The greatest challenge to using DT in education is our failure to provide a way to learn and to practice the fundamental skills of team-based design. The simplest step to remedying this is to teach Improvisation. Once the connection between the skills of Improv and the skills of DT, becomes obvious, we've given students a "road map" to follow to team-based success.