DivergeConverge

Learn to Become an Innovator
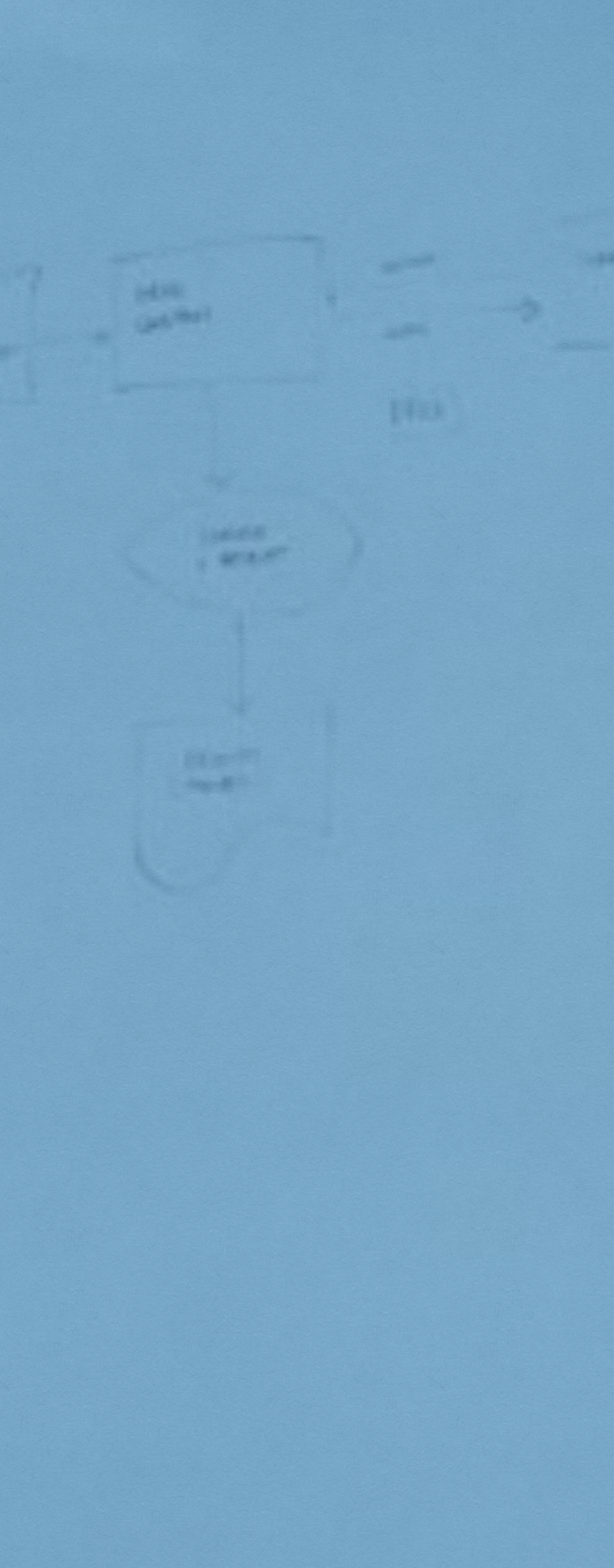
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Creative Culture

For any innovation process to work you must have a space and certain standards that invite the inborn creative abilities of everyone involved to burst forth.

An example in education…

Which of these two environments look more creative? Why?

It's safe to say that every organization wants high quality results and some kind of process to accomplish that. However, to make that happen we often over-standardize and create too many linear plans. Creativity is not a mess, but it is organic and requires more wiggle room than linear thinking can give. To foster creativity we have to be willing to care for variability and improvement.

What makes it creative?

"The idea, of course, is to strike the right balance between order and chaos."
~Steven Johnson

Your organization or group or class needs to be stable enough that chaos doesn't break loose, but you have to be willing to be open and vulnerable enough to let the unexpected and inspirational connections happen. Steven Johnson calls this a liquid network. A big key to innovation is being open to making lots of connections.

"A hallmark of a healthy creative culture is that people feel free to share ideas, opinions, and criticisms." ~Ed Catmull

Make a commitment to be candid—but kind. Candid means that we are straightforward and truthful. In innovation, it is important that we critique the idea, not the person. This helps us be candid. A candid photo is a photo of someone in real life that often shows that person as authentic and genuine as possible. Be that way in all that you do.

"Human life is like the rest of life on earth; it is characterized by diversity."
~Sir Ken Robinson

Life is organic and we are more analog than digital when it comes to our behavior, thinking processes, and everyday life than we might like to think. So do all you can to foster individuality and self-expression while focusing on the group's end results.

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Creative or Innovative?

Creativity

It's definition is often fuzzy, but most scholars agree that creativity is having original ideas that have value. That value and originality are a bit subjective. It may only be new to you and valuable to you, but because it is new and it is meaningful, it is creative.
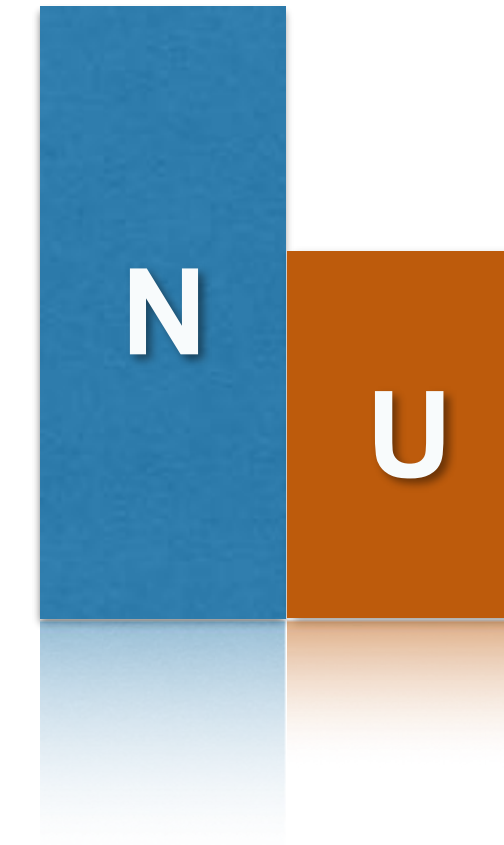
Innovation

This is when we have original thoughts that are meaningful, but are then implemented into society. We use our creative thoughts to create solutions to the problems and issues around us.
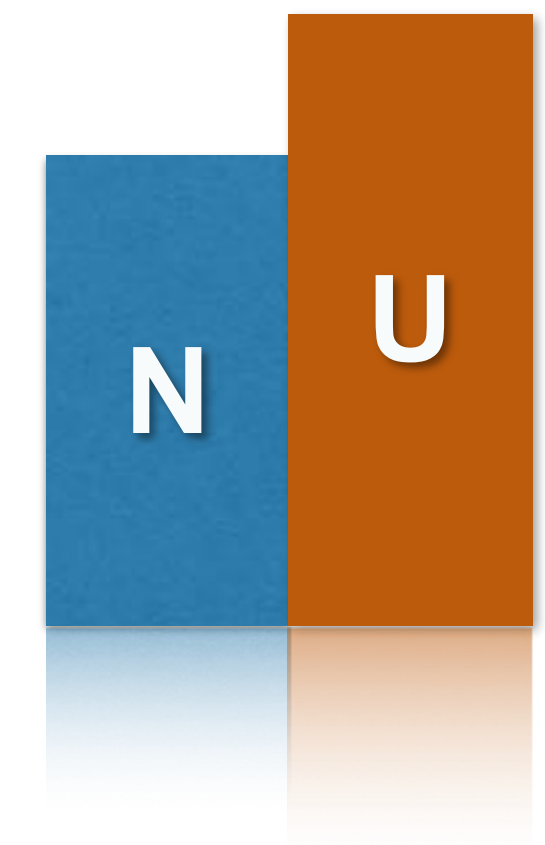
How They Work Together

When we are solving issues and implementing them into society, we are being innovative. However, it takes our creative juices, behaviors, and problem-solving abilities to make that happen. Creativity can lead to innovation, but not always.
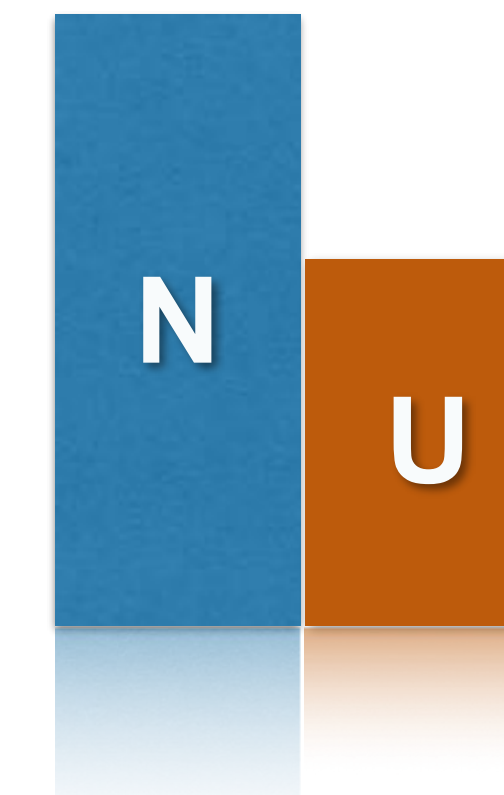
Expressive

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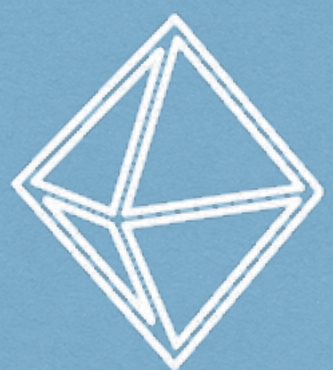**Innovative**

N U

Scientific

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Why Innovation?

Innovation is our modern currency.

What does that mean? It means that the economies and organizations of the world agree that innovation is absolutely key to being successful in our modern age. Having people who are innovative is of increasing demand.

The children of today will retire in the 2070's. How can we really promise them that their education will prepare them for the future if all they're doing is preparing for end-of-level testing? What we can offer the rising generation throughout the 21st century are mind and skill sets that are timeless. And those are found in innovation and creativity.

Innovation is what made mankind rise above the rest of the world in history and it is what will help our rising generation meet the demands of the future.

What can you do to make your environment more creative?

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Understand

USERS

"For people who regard themselves as tasked with problem solving or innovation, it is imperative to encourage and elevate the practice of observing everyday events."

Observe

We only see what we are conditioned to see.

We all have a filter of some kind that prevents us from seeing our world with new eyes. Some of those filters might be:

Occupation (student, teacher)

Hobbies

Age

Gender

Religion

It is necessary for us to break beyond these filters and see the world with a fresh pair of eyes.

Key Points:

- Observe normal, everyday things, but try to see them as new or different.

- Seek a different perspective.

Time to go Problem-Spotting!

Experience

Empathy is the essence of gaining understanding.

You cannot really solve a problem until you feel, see, and know as your target audience does. Now, you can't do all of that, but there are some things you can do to see the world from the perspective of your users.

One way to accomplish this is to take activities you have everyday and act as if you never experienced them before. We call this "Vuja de" (a play on the French term Deja vu). If you take on brushing your teeth, for example, like you have never done it before, what do you learn about the product and the experience? What do you learn about your novices and experts?

Try it out and see what you discover!

Key Points:

- Vuja de

- Think of traveling or spending time with those that you are trying to help

- Ask lots of "Why" and "How" questions

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Record your reflections here

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Inquire

You'll never know until you ask.

There are secrets to your problem that you cannot see yet, even though you have tried to observe and experience it for yourself. Sometimes, for those really tricky things, you have to ask the experts and/or the community to learn more.

Google is great for information, but when you need insight, you need to go out and do some interviews. Asking lots of questions (especially follow-up questions) will be key to getting the most of our your interviews.

Don't be afraid of having your interviewees draw pictures or tell stories, role-play, or even act things out. Get all the info you can. Remember, pictures are worth a thousand words.

Key Points:

- Ask lots of questions (follow up ones too!)

- Have interviewees interact with you

- Take some pictures

Interview Questions

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Network

Sometimes it's who you know, not what you know.

Go and connect with people and don't just use social media to do it. Creativity and innovation flourish with connections—ideas and people alike. So go find the people who eat, drink, and sleep the issue you're solving.

Go find the people who can also help you see what worked before and what hasn't worked. You can learn from the failures as much, if not more, than the successes.

The greatest network is a diverse one. Connections are key and if they look all the same, you don't have a great network. Find people different from you to bounce ideas off of because they will help you see what you couldn't see before. Steven Johnson says, "The most productive tool for generating good ideas remans a circle of humans at a table, talking shop." (Johnson, 61).

Key Points:

- Connect with experts and community

- Learn from failed ventures

- Eat lunch with someone different than you

Your network…

USERS

Shape

"The formulation of a problem is often more important than its solution."

—Albert Einstein

Organize

Let's come together…

After research it's time to share! Defer judgment by letting everyone share the things they have learned and don't toss anything out yet. Share your pictures, your questions, your experiences, etc.

After you've shared and have all of the info on the table (or the whiteboards or walls) start organizing it into categories (put your sticky notes in columns, etc.). Try and keep your categories to a limit. This will help you better see what you accomplished and what you learned.

Key Points:

- Let everyone share; defer judgment

- Organize your research into categories

- See if you can narrow them down to a handful

Taxonomize

Simplify

"A problem well stated is half solved." ~Alfred Whitehead

With your categories up and running, it's time to break them down to get to the root of the issue. Creating problem statements can be tricky, but it is a simple statement that gets right to the core. If your statement is too big or too long, it's not driving at the root and it may mean you do not fully understand your problem.

Make problem statements for each of your categories.

Key Points:

- Keep it simple

- Get right at the core of the issue

- If you're having trouble, look at what you may be missing from your research

Problem Statements

Clarify

The launchpad to solutions is a good question.

Problem statements must then become problem questions. Problem statements may seem like negative complaints, "Bike locks are too heavy and cumbersome", but problem questions are specific and positive.

To increase productivity, begin your questions with statements like, "What are all the ways we can…?" or "How might we…?" This way you can get your engines ready to explore.

Key Points:

- Keep them simple

- Keep in mind your root problem

- Start off with positive "How might we" or "What are all the ways we can" statements

Problem Questions
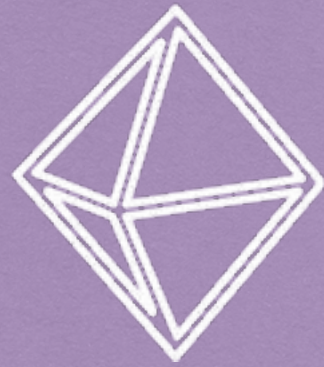
USERS

Explore

"The best way to have a good idea is to have lots of ideas."

—Linus Pauling

Question

Pushing our limit with more questions.

Ask all the "What if" questions you can. "What if we completely did away with…?", or "What if we added…?", or "What if we do…?". The idea is to go crazy with all kinds of questions with your problem questions as a launch pad for your exploration.

It may also be helpful to list all the attributes of the problem. For example, for the picture on the right, we could list the morse taper, the gear-like saw tips, and etc. Listing all of the attributes of our issue may give you a better idea of the complexity or simplicity of the issue.

Key Points:

- Ask as many "What if" questions as you can

- Attribute listing may be helpful to understand your issue more and create more ideas.

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"What if" Questions and Attribute Listing

Compare

Connections and creativity go hand-in-hand.

Don't be afraid to make connections. Right now is a time to diverge and seek inspiration from the world around you. So, defer judgment from your partners and from yourself and bring in crazy, random associations as well as things that are crazily similar.

Your brain is what it is because it uses neural connections to bridge communities of thought together. The world is built on such bridges as well. Let your inner creativity burst with the opportunity of unlimited connections.

Key Points:

-.Defer judgment

- Make as many connections as you can

Forced Associations

This is a tested and proven technique to help you with your comparing. This is where you use a word or noun search engine of some kind to get you started. Use these, and other associative nouns, to get you started on your crazy comparison activity.

- Skateboard

- Horse

- Baker

- Fireman

- Swimmer

- Umbrella

- Rain Jacket

- Rain Boots

- Hat

- Gloves

- Mechanic

- Windshield

- Wipers

- Sunroof

- Car Seat

Make connections!

SCAMPER

SCAMPER is here to assist you in your efforts to keep breaking down your ideas into as many solutions and opportunities as is possible. Some aspects of SCAMPER may not work as well as others, but give it a try and see what you can come up with.

Substitute

Combine

Adapt/Alter

Modify/Minimize/Maximize

Put to Another Use

Eliminate

Reverse

Room to connect…

Visualize

Every solution needs to have a great story.

You must be able to tell the story of how your product, system, or service will go from market to the hands of your users and beyond. How is your ideal person going to receive your solution? How does it work in the first place?

Create a storyboard (we have some room for you to do that) where you can see the process of implementation. This will help you catch a vision of your solution and help prepare you to share it with others. This is also a chance to test sustainability and impact among your users before it actually goes to market.

Also, begin making sketches of how your product is going to work.
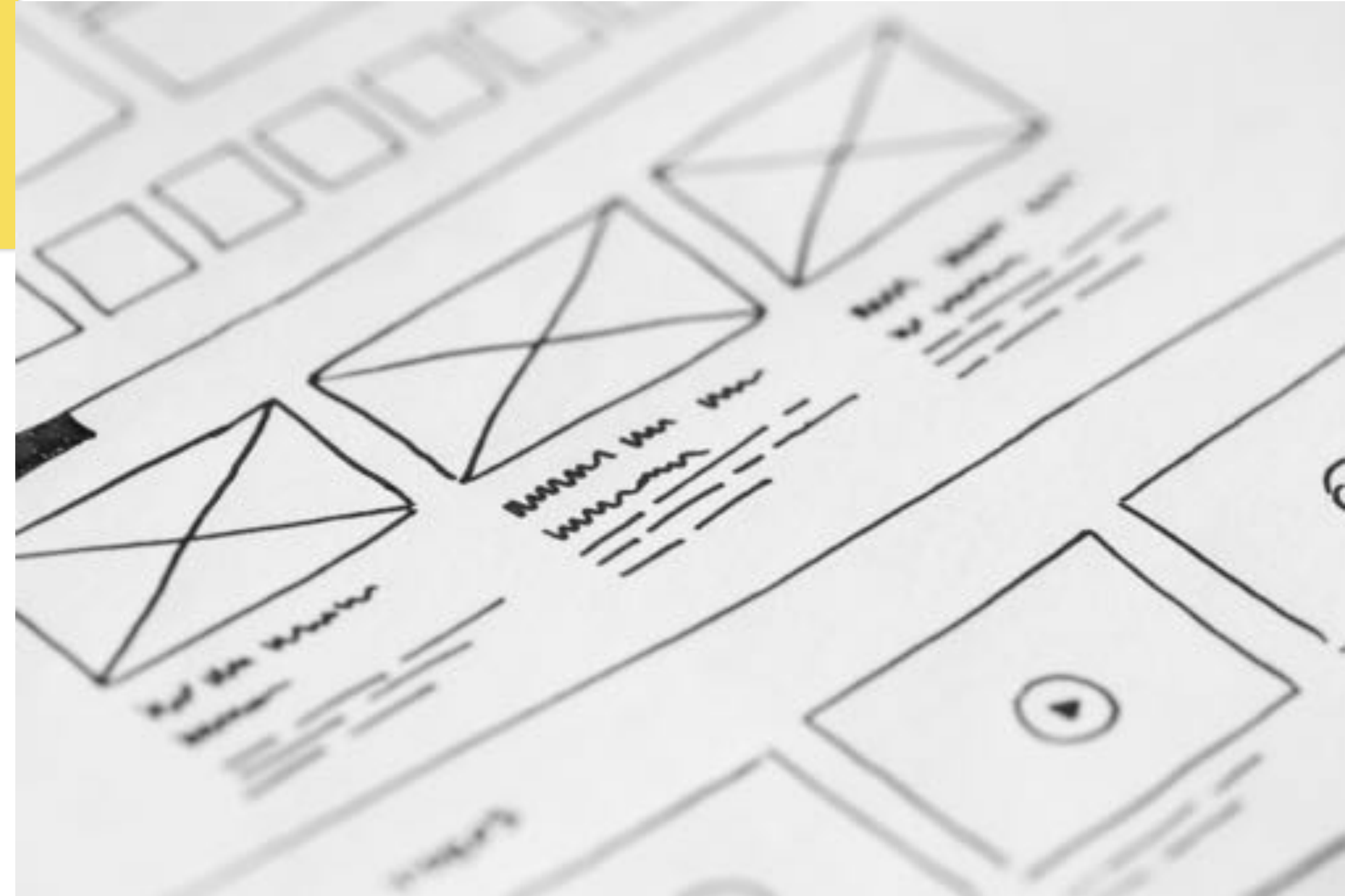
Key Points:

- Tell the story of your solution from market to user

- Think of the big picture

- Think of the people you will affect

- Sketch your ideas

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Sketches…

Storyboard

Validate

Give life to your imagination.

Validation or confirmation that your idea is a good one will only come as you begin to prototype it. Making a 3D model gives you something tangible to let you and your users play around with to find the throw-aways and the things that stick around to your market product.

Your model should not be perfect. Do not worry about making it out of expensive materials. In fact, the cheaper and the cruder, sometimes the better. The model is to only validate your idea, but to also help you learn more of what your users need. Prototypes should be ready to be trashed or transitioned into the iterative process.

Key Points:

- Make a tangible prototype

- Do not try to make it perfect

- Use simple materials

Iterate

At first, you will not succeed.

Iterate means we do it again, again, and again. Your prototype, as perfect as you may believe it to be, is not award-winning yet. The lightbulb took thousands of failed prototypes for Edison to learn what worked. Yours will take a few attempts, at least, to get just right for your users.

This is the part of the process where you take your prototype and you test it with your users and let their feedback give you the vision of what to change, improve, or keep. Failing early and failing often gives you the success of knowing what does not work.

Go get feedback, come back and fix your prototype. Do it again, again, and again.

Key Points:

- Let user feedback update and improve your prototype

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USER**S**

Share

"A man who cannot communicate his ideas is on the same plane as one who has no ideas."

Show

No words required.

Showing off your work is simple. You do not need catchy phrases (not yet anyway). All you need is to show and present your work in a way that sends the implicit messages that we should buy into it. You can tell how good a product is by how quickly and accurately people can use or describe it themselves once being shown it.

Your work is not the only thing that needs to be shown off. You do too. Your body language is 55% or more of the messages you send to others. Stand strong, use your hands appropriately, and make eye contact with your audience. If they cannot trust you, they'll never trust the product.

Key Points:

- Showcase your work in a way that it is almost intuitive for your audience

- Showcase you by being intentional about your body language.

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Demonstrate

Teach me how to fish and I'll eat forever.

Showing off your work is powerful, but the next step is to demonstrate how it all works. A good demonstration will tell your audience how easy or affordable or truly innovative your idea really is.

The classic infomercial is a great example of demonstration. You have a confident person showing you right then and there how the product works with a strong invitation to come and take part. Demonstrate well and you could sell your idea long before people pull out their wallets.

Key Points:

- Demonstrate how it works

- Show off the cool features

- Think about having novices try it out to see how awesome it really is

Describe

You had me at story…

Stories sell. Stories are what grab people into news articles, into department stores, into repair shops. They connect people across cultures and continents because at the heart of every story is a person like you and me. So make the eyes of the world point to you and your idea with the universal power of a great story.

Help us gain understanding for what you feel and see as a problem and then walk us through your shaped exploration that has been refined into a beautiful idea worth sharing with the world.

Key Points:

- Tell a great story

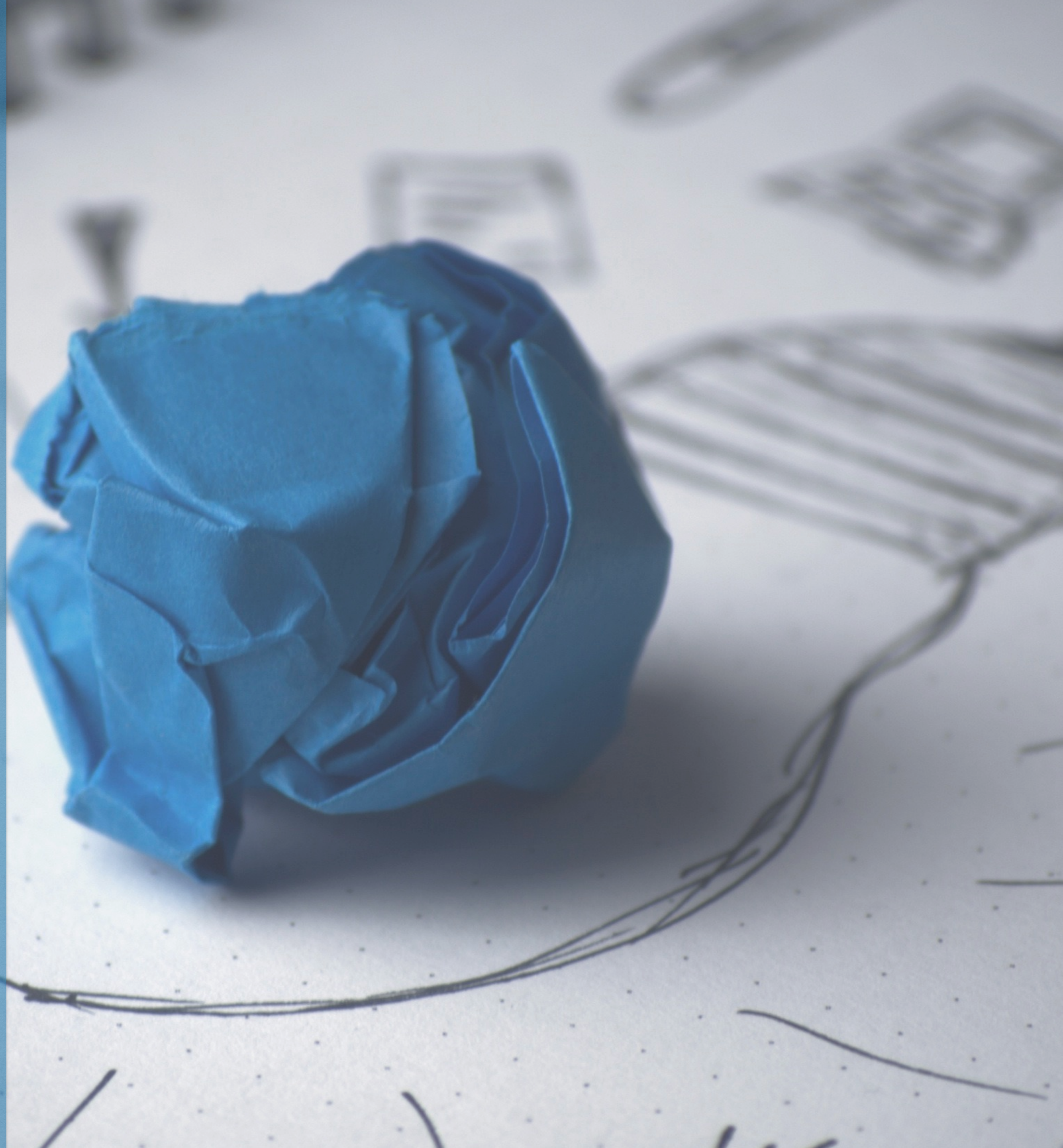- Keep it simple, but give us empathy

Conclusion

"The power to create is not reserved for one, but for all. We all have the capacity to create not just beauty, but meaning; not just experience, but connection; not just solutions, but abundant opportunities where there never was before."

Therefore, What?

You have now learned how to tap into your creative powers and become innovative using divergent and convergent thinking. These principles can help you in any facet of life or in any organization or industry to be more innovative and to meet the needs of your "users." You cannot change others, but as Ghandi once said, "[You can] be the change you want to see in the world." Go and invite change by establishing a creative culture at school, work, or even home and let the principles of USERS guide you to new and better solutions to your everyday big or small problems.

Reflection

References

Where Good Ideas Come From by Steven Johnson

Catmull, E., & Wallace, A. (2014). Creativity, Inc. London, UK: Bantam Press.

Ken Robinson Quote: https://ww2.kqed.org/mindshift/2016/08/15/sir-ken-robinson-how-to-create-a-culture-for-valuable-learning/
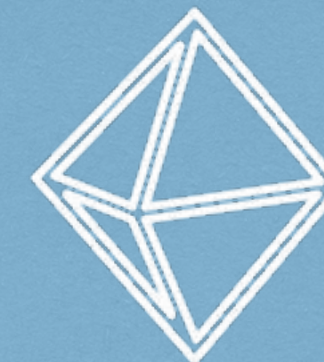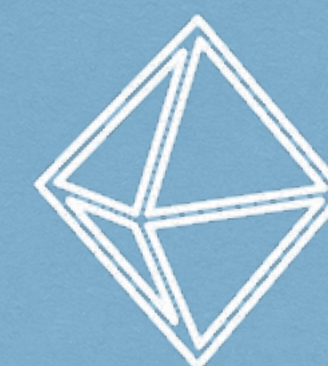
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Keep learning at