RAMAIAH
Institute of Technology

Welcome To
Design Thinking

(AEC16)

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UNIT I

- Introduction to Design Thinking
- Design and Business
- Design Thinking for Education
- Design Thinking Mindsets: Six Key Mindsets
- Other Mindsets for Success.

Introduction to Design Thinking

Design Thinking and Why it Matters

- In a world of constant change and innovation, we need to change the education we provide our students, focusing less on *what* students should learn and more on *how* they should learn.
- DT will allow your students to approach any type of problem or circumstance like a designer, becoming agents of change for their community and the world.

Why do we go for a designer? What does a good designer provide?

- Take our needs into consideration
- Offer a suitable solution/ design
- Gives ideas to improve the current solution/ design

How does a good designed arrive at the solution?

- Randomly
- Use design process/ strategies
- By following instructions from books

Combining the above, can you come up with a definition for design thinking?

Take needs into consideration (human centered methodology)

- Offer a suitable solution/ design
- Gives ideas to improve the current solution/ design

Using design process/ strategies to think, plan and take action

Text Book Definition of DT

- **Design Thinking (DT)** is a human-centered methodology that democratizes the design process by providing the structure and tools for every person to think and behave like a designer.
- **Define Designer ?** A person who uses the design process and strategies to think, plan, and take action in improving a situation/experience or solving a particular problem.

Task: Design and improve something!

You will use the **design process** to improve or redesign an object or system. You will perform the following objectives to complete the challenge.

Identify a "problem" or something you want to redesign or improve

Gather and record information to understand the challenge and multiple perspectives

Create a list of possible ways to solve the problem, or redesign/ improve your object or system. Select the most effective and desirable idea to create that will meet the success criteria.

Create something that communicates your creative idea!

Test it out, record results, get feedback and make improvements based on testing.

DT Process consist of five phases:

- Each of these phases has a particular goal, with actions that help the designers achieve this **Goal**.

Is Design thinking a Process? (Most People Think)

It is much more than that

- To properly utilize the process, designers need to understand the philosophy behind the approach and possess essential attitudes and mindsets that make them prone to **innovate behaviors and actions.**

Design and Business

DESIGN AND BUSINESS

- Tim Brown, the CEO and President of **IDEO.**
- **A design and innovation company that popularized design thinking.**
- **Defines the methodology for the business world as a "human-centered approach to innovation that draws from the designers toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success".**

Change by Design- Universal Definition

that is suitable for Multiple Fields and situations.

- "new ideas that tackle the global challenges of **health, poverty**, and **education**; new strategies that result in differences that matter and a **sense of purpose** that engages everyone affected by them".
- Companies/Organization started to transition from designing tangible products to **designing and improving real-world experiences**.

Cont..

- In 1991, IDEO designed solutions to problems
  - Branding, energy, education, the environment, experience design, financial services, and many other fields.
- One of the IDEO's earliest design was the first mouse(by **David Kelley** with Costing $17) for Apple.
- All these solutions were designed through a combination of human centered design and a culture on innovation that was called "**design thinking**" on account of Kelley frequently using the word "**thinking**" to describe what he did as a designer.

Cont..

- Today many companies such as
  - The South Korean technology gaint **Samsung** established in-house design group, the corporate design center.
  - **IBM** has changed its focus from engineering to user needs and experience.

Statistics:

- In 2012, **1 designer** in the company for every **80 computer programmer**.
- In 2016, **1 designer** in the company for every **20 computer programmer**.

DESIGN THINKING FOR BUSINESS

- **GE Health Care**, a company that provides medical technologies and services. **Doug Dietz** had been working on a specific MRI Scanner

Old MRI machines, and GE adventure series MRI machines

Design Thinking for Education

DESIGN THINKING FOR EDUCATION

- DT in the Classroom:

Design thinking is a combination of **human-centered**, inquiry-based scaffolding and innovation-friendly mindsets where students apply **transdisciplinary knowledge/skills** with **creative practices** to collaboratively **discover empathetic insights**, generate and explore radical **ideas**, and **create, test,** and improve **tangible outcomes**;

- It is having courage and attempting to bring meaningful change to people's (or their own) lives, improve real-world experinces, or develop solutions to complex problems.

Why it Matters

- DT is crucial for students to develop into **future-ready citizens** who can learn and have the confidence to tackle challenges no matter the situation or circumstance, who are able to **learn continuously** in a world of constant change and innovation.
- Some of the DT educational approaches are
  - **Project-based learning(PBL)**
  - **Science, technology, engineering, and mathematics (STEM) education**
- Both in PBL and STEM, Teachers take on the role of **Facilitators**, spark the curiosity of students, and guide their students learning.

Cont..

- DT provides students the vehicle for
  - **Inquiry**, teaching them **how to think, reason, analyze, empathize,** and use their **natural curiosity** to **find solutions** in these **transformative education approaches**.
- DT also provides opportunities for **best practices** to occur in **teaching and learning**.
- In technology, students learned **basic programming concepts** to create their virtual wildlife sanctuary, which they published online to share with the public.

Students who use DT

- More **engaged** because of their challenging and interesting topics.
- Students are responsible for their own learning, going through the different phases of the process to pose
  - questions, investigates, and apply the knowledge and skills they gain to meaningful challenges.
- It also increases the **opportunity** for collaboration and provides multiple instances for meaningful feedback from the **teachers** and **peers**.

DT can help students

- To see problems and challenges in a **positive light as opportunities for improvement, change**, and **resolution**.
- It empowers them with **skills** and **confidence** to believe they could make a constructive impact on any situation, even if they are not an expert in the issue.
- They'll believe they have the capacity to be **creative designers** who can come up with **new and effective ideas.**
- DT gives them the **permission to fail, learn from their failures**, and **improve upon their solutions with an optimistic and enthusiastic attitude.**

Imagine if Students learned the DT process starting in Kindergarten?

- What complex problems would they be able to solve by the time they got to high school?
- What new problems would they be able to identify that we were unaware of?
- Imagine them leaving our schools for the real world.
- Imagine them being aware of the infinite possibilities of what they can do and who they can be.

David Wallace, an engineering professor at MIT

Who said, “More than any thing I hope they(Students) have the confidence and perhaps a little bit of arrogance to think that they can solve just about any problem, but at the same time be humble enough that they realize they’re going to have to work really hard to get there”.

- DT has been able to **empower** and unlock **human creative potential**.

More than a Process:

DT Mindsets

Introduction

- DT was only a process ??
- A magical step-by-step method that had the potential to transform "**unimaginative**" students into wondrous creatives.
- It gave them strategies to think creatively, but the products they produced weren't particularly inventive or innovative.
- No one seemed to be going beyond the obvious.
- DT is a **specific way of thinking**(hence its name, design thinking).
- The valve and mindset allow creative outcomes to emerge.
- **Culture of DT** is much more valuable than the actual process.

Webinar, "Design Thinking = Method, Not Magic"
Bill Burnett, Executive Director of Stanford's Product Design Program

- **"Culture eats strategy for breakfast"**
  - It describes how it is ineffectual to use a process that is not compatible with the culture of a group.
  - Group's Culture that affects how people work, behave, and make decisions.
- Burnett explained, **"If you have the wrong kind of culture it doesn't matter what process you use… it wont make any difference because culture rejects the process. Culture is always stronger than the process or programs that people put in place because culture is the unspoken rules of behavior of any organization, and that's how, really, things get done."**

When Students attempted to solve problems using DT process

- Their **behaviors, actions, and interactions** with one another were not conductive to producing desired results with the DT process.
- They had **difficulty designing a solution** based on end user preferences and needs rather than their own.
- They were **fearful to try new things, make mistakes, and fail in their work**, which many times led to doubt, pessimism, and a tendency to give up.
- Some believed that they held fixed traits in "**lower**" intelligence and talent that correlated to lower work performance.
- **Students were not able to effectively use the DT process because they did not share core valves that encompass a culture of innovation, which makes the effective execution of DT possible.**

SIX KEY MINDSETS

A mindset is a set of attitudes that reflect how a person thinks or feels about a particular thing.

- These attitudes can affect the way they behave in a particular scenario.

Example:

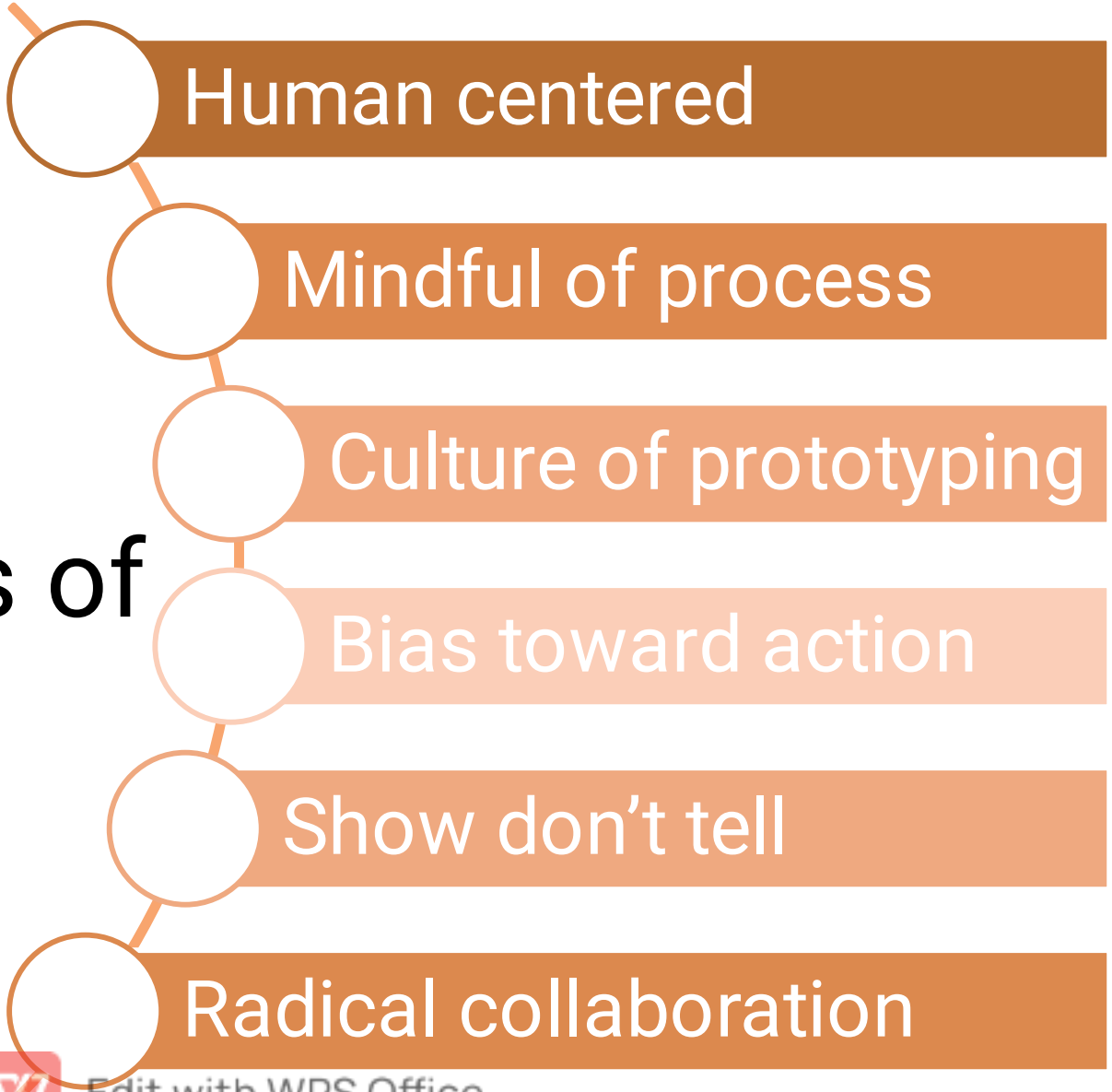
- **If a student has a fear of failure and never wants to make mistakes.**
  - **He/She would be likely to hesitate in taking action, making important decisions, and trying new things when working in the DT process.**

The d.school, Stanford's design institute by David Kelley

- Provides students with learning experiences that "**unlock their creative potential**" through the application of DT in multidisciplinary, real-world challenges.
- d.school created a program called **K12 Lab Network** that promotes the implementation of DT into classrooms and schools to bring capacity and agency to educators who wants to create positive change in education.

DESIGN THINKING MINDSETS

K12 lab's classification:
6 key mindsets of designers



K12 Lab Network wiki

- The six key mindsets required by designers to use DT to its fullest potential:
  1. **Human centered**
  2. **Mindful of process**
  3. **Culture of prototyping**
  4. **Bias toward action**
  5. **Show don't tell**
  6. **Radical collabration**
- These mindsets help students behave and perform like design thinkers who produce novel solutions to problems and challenges, and ingrain a self-belief that they can take actions to bring postitve change.
- The six key mindsets have been defined through actionable, "**Students will be able to…**" statements based on the work of the K12 Lab Network.

Human Centered

Students will be able to gain inspiration and direction from users and respond to human needs by placing the user at the center of all empathy work .

- Students who have a human-centered mindset are able to think in the perspective of others, particularly the person/ people they are designing a solution for.
- They can "**walk in the persons shoes**" to gain an understanding of their needs and wants.
- The prevailing focus throughout the DT process and in each phase **are the people we are designing for** (they are the most important factors in the design process).
- Engaging and interacting with these people can results in the emergence of inspirations and insights that direct designs to desired outcomes.

Mindful of Process

Students will be able to be thoughtful and reflective of the work being done, how the work is being done, and how the work will improve.

- It enables students to think about the work they are doing in a particular phase of the design process.
- Each phase has its **own purpose, goals, and strategies**.

Example:

- If a student is in ideate phase, where they are collaboratively brainstorming a solution for a particular problem, they will need to be openminded, defer judgment, think beyond the obvious, build on the ideas of others, and generate a large volume of ideas.
- Being attentive to these **behaviors, goals, and thinking** will allow students to be get the most out of each phase in the DT process.
- A crucial part of this mindset is reflecting on **how the work is being done** and **how it can be improved in each phase**.

Students will be able to be thoughtful and reflective of the work being done, how the work is being done, and how the work will improve.





Improvement from traditional suitcases to suitcases that follow you

Culture of Prototyping

Students will be able to explore and experiment, build things to learn and think things through, and engage users with prototypes to elicit and receive feedback.

- With this mindset, the process of creating artifacts or solutions allows students to **continuously learn** and **apply** their new learnings to improve what they've built or developed; ultimately, this **will result in high-quality products or solutions.**
- This **build-to-think** mentality is best described by **David Kelley**:
  - This building, this doing, prototyping, whatever we're going to call it, is a way of thinking as opposed to the kind of grubby thing manufacturing does after all the decisions are made. We spend a lot of time getting the students [...] to kind of think about how can you be really clever about jumping right in and finding out as much as you can from building.
- A student with a prototyping mindset is inclined to rapidly create and test to quickly learn from failures and receive feedback. They use their creativity to apply what they have learned to make improvements to their artifacts or solutions. This iterative, **trial-and-error** process of prototyping is done so frequently that it results in

Bias Toward Action

Students will be action-oriented to quickly think and learn, as well as make decisions

- A **bias toward-action** mindset gives students the tendency to take initiative, make decisions, and take self-directed actions.
- This **mindset** is extremely important to DT because all the phases in the process require students to have action-oriented behavior.

Example:

- In the **empathize phase**, students need to engage with people and experience their perspective to gain a deep understanding of the challenges they face.
- In the **test phase**, students need to perform repeated tests to gain valuable data and feedback that is later synthesized and used to make improvements.
- To have a **bias toward action**, students need to overcome their fear of failure so that they don't simply try and give up when obstacles arise.
- Fear and self-doubt can debilitate students from taking risks or acting upon a spark or revelation. Overcoming this fear and embracing failure allows students to be creative, generate a wide range of ideas and possibilities, and try out novel and audacious things.
- **Action-oriented behavior** occurs when students realize that failure is not the outcome but part of the process, and with an ample amount of iterations, their prototype will transform into high-quality product or solution.

Show don't tell

Students will be able to communicate and share ideas visually for clarity, understanding, and decision-making.

- With the **show-don't-tell mindset**, students communicate and share ideas through visual representations in the form of a **sketch, tangible prototype, or digital visualizations**.
  - These visuals can make a complex idea easier to understand and bring clarity to information that might be perplexing
  - A simple sketch can stimulate further discussions, identify unanticipated problems, and bring everyone on your team on the same page.
- **Showing your ideas can also help organize your thoughts and improve the information you want to communicate clearly**. Since sharing visual ideas is a great opportunity for gaining feedback from stakeholders, it is important for students to be open-minded to constructive criticism and refrain from defensiveness so that they can learn and their ideas can improve.

Radical Collaboration

Students will be able to collaborate and create partnerships with people of different disciplines as well as the users to develop innovative ideas and solutions.

- Students who have a **radical-collaboration mindset** are able to learn and work together effectively using social and interpersonal skills to complete a common goal.

Example:

- Designers can **collaborate with the people they are designing for**, creating an inclusive partnership where the end user is seen as a viable expert.
- Additionally, since DT is used for real-world challenges and problems, it is important for students to **work with experts from multiple disciplines**.
- This mindset values **teamwork—students** and teachers working together effectively and efficiently for one common goal.
- Teamwork takes place in a **family-like atmosphere** where students build positive relationships **based on trust and appreciation of one another**. In **caring for their teammates**, they also apply empathy with the emotions and feelings.
- Valuing **teamwork minimizes** the occurrence of hierarchical relationships where a few individuals assert dominance in a project. **Minimizing competition** between students also helps **increase morale, improve**

OTHER MINDSETS

Other important mindsets for success

Improve/Learn from failures

- Must change the way they view failure and see it as a way to identify what needs to be improved.
- "Don't think of it as failure," explains Tim Brown.
- "Think of it as designing experiments through which you're going to learn"

Creative Confidence

- David Kelley- Creative Confidence is believing one has the ability to come up with new ideas and the courage to try them out.

Creative "Courage"

- David Clifford from K12 Lab and Design School X uses the term "Courage" instead of "Confidence".

Growth Mindset

- In her book Mindset: The New Psychology of Success, Carol Dweck identifies two mindsets.
- Some people have either a "fixed mindset" and the later mindset is essential for students when using the DT process because it gives them practical optimism.
- Continuous learning, practice, and dedication, students gain a hopeful Confidence. They understand that obstacles are not permanent barriers.

Beginner's Mindset

- A beginner's mindset is concept from Zen Buddhism that involves the attitude of thinking and seeing from a novice's point of view.
- Few principles Students should follow to obtain a beginner's mindset
  - It is important for design thinkers to not judge or advance their own opinions.
  - They also need to respectfully listen
  - Question Everything

Liberatory Design Mindsets

- Liberatory Design is an adaptation of Stanford d.school's DT process that includes two additional phases.
  - Notice and Reflect.

The following are the mindsets required for designers to use the Liberotory Design process effectively. The mindsets are expressed as actionable statements.

- Practice self-awareness to minimize harmful, effects of privilege and oppression to the design process.
- Focus on human values to place the users at the center of all empathy work.
- Recognize oppression to identify inequalities and their causes to address deeper needs.
- Embrace complexity to remain patient and stay open to possibilities.
- Seek liberatory collaboration to reframe the user-designer relationship as one of partnership.
- Build relational trust to authentically collaborate and gain emotional trust.
- Have bias toward experimentation and action, and build to quickly think and learn.

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References:

David Lee, Design Thinking in the Classroom, Ulysses Press, Korea, 2018

THANK YOU