RAMAIAH
Institute of Technology

Design Thinking

(AEC16)

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UNIT: II

- The Design Thinking Process

- The Five Phases of Design Thinking

- Empathize Phase: Self-Awareness and Partnerships, Interviews, Observations, Immersion, Research, Empathy Map, Projects

- Define Phase, Synthesis: Finding Needs and Insights, Problem Statement, "How Might We" Question.

  - https://www.youtube.com/watch?v=5CUt2QQsJfc

The Design Thinking Process

DESIGN THINKING PROCESS

Transdisciplinary skills/ knowledge
+
Creative practices
+
Radical collaboration

→
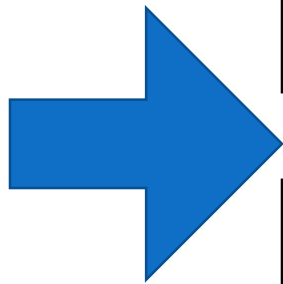
Empathetic insights
+
Generate & explore radical ideas

→
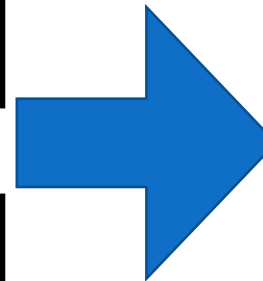
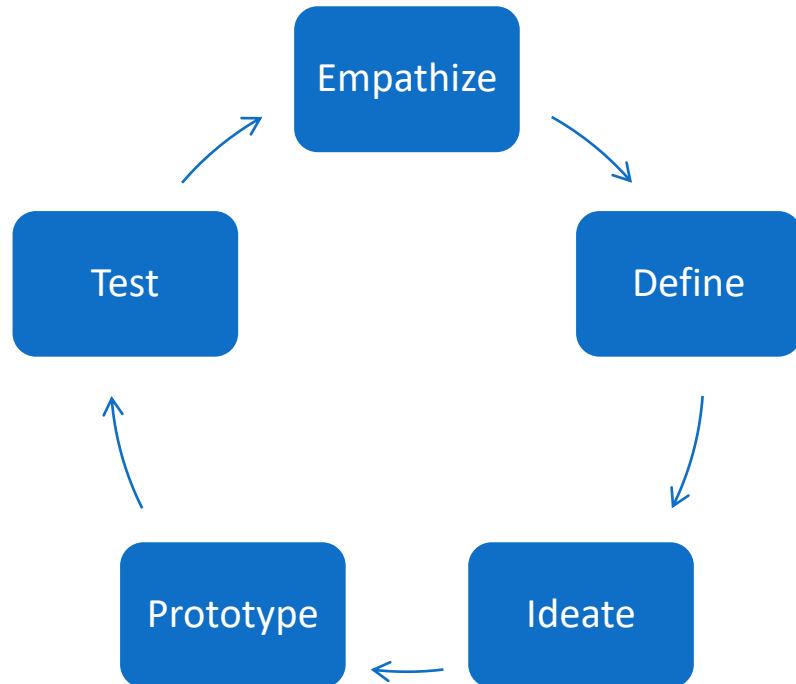| Create, test and improve tangible outcomes |
| :---: |

The Five Phases of Design Thinking

5 PHASES OF DESIGN THINKING

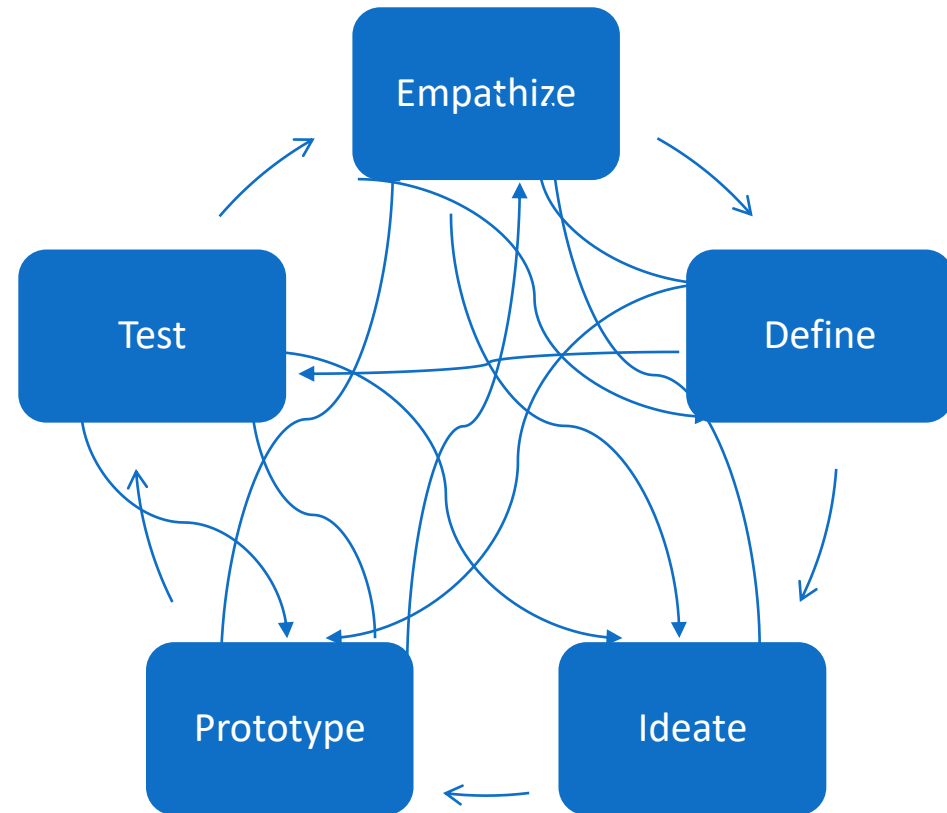Expectation
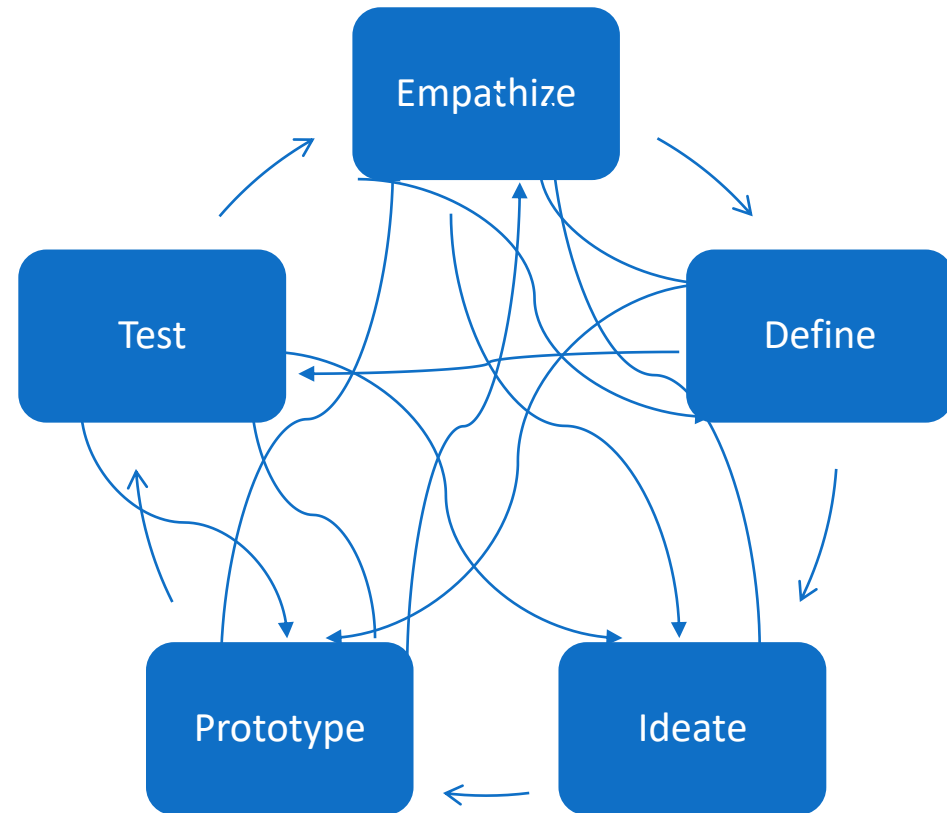
Reality

5 PHASES OF DESIGN THINKING

- It is natural to jump from one phase to another in a non-linear manner at any time, based on need.

- The term 'phase' suggests a random, cycling quality to the movement between processes.

- Phase – a short period of time during which a person behaves in a particular way.

Empathize

Test

Define

Prototype

Ideate

Reality

EMPATHIZE PHASE

EMPATHIZE PHASE

➢ In **Empathize phase**, Students gain a **deep understanding** of the needs and desires of the end users, the people who will be using the solution designed to solve a problem or improve a real world experience.

➢ Students take **specific action** to know, understand, synthesize, and share the feelings, values, and experience of the end user.

EMPATHY

➢ According to Tim Brown Empathy work as the "effort to see the world through the eyes of other, understand the world through their experiences, and feel the world through their emotions."

➢ Students gain empathy by engaging in interviews, observations, immersive experiences, and research.
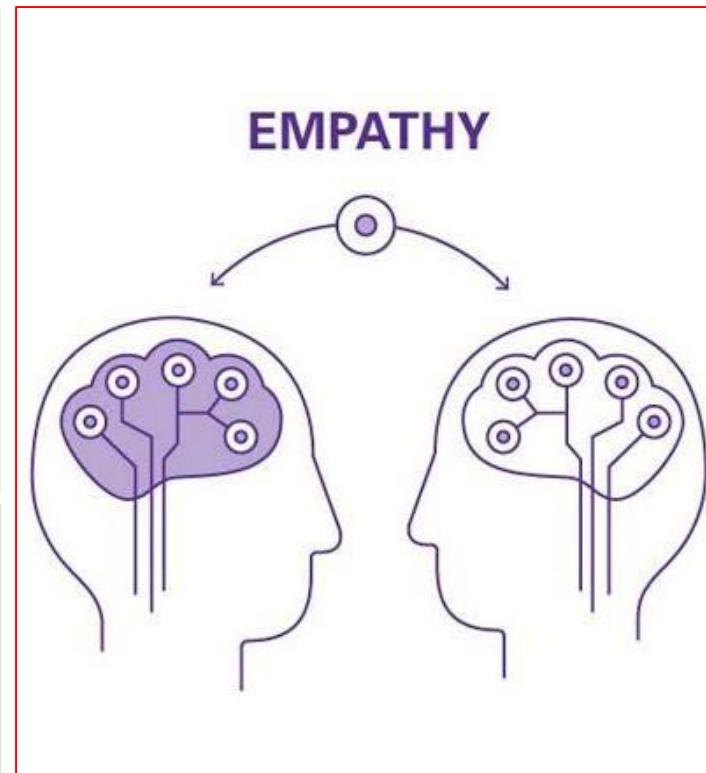
Empathize phase: Self-Awareness and Partnerships

➢ Students need to be aware of their own identity, biases, emotions, and assumptions to establish a partnership with end user.

❖**Mention few good aspects and few bad aspects about this design**

- The bottom tray is very comfortable

- The table tray should have been movable

- Two arm rests might be better

- Is very difficult for left-handed people

- Difficult for heavier people

❖ Vegetable Kitchen Gadgets Tested By Design Expert

Fullstar vegetable chopper, Rapid Slicer,

Upright carrot peeler,

Empathize phase: **Interviews**

➢ Interviewing end users give students the **opportunity** to directly learn about the user's aspirations, motivations, and attitudes that could be powerful factors to the design of a solution.

❑ **Interview Rules:**

• Don't get distracted.

• Be polite and respectful (listen)

• Speak clearly. Introduce yourself and your intent before you start the interview.

• Don't interrupt.

• One person ask questions at a time

• Ask "Why?" politely.

• Take notes and sketch information.

❑ **Interview Principles:**

- Ask broad questions and "Why?"

- Incite stories

- Have a conversation instead of an interview.

- Listen and don't judge.

- Take detailed notes.

❑ <u>**Interview Questions for Community Members:**</u>

- What do you like best about your Community?

- What is your daily Schedule?

- Do you live/work in this community? How long have you lived/worked here? How do you get to work /home or out of this community?

- What has changed in this community since you first started working/living here?

- What do you like to do on your free time/breaks? What do you like to doin your spare time?

- What interest do you have?

- Why is a good for your business? Is it or is it not?

- Can you describe a place that you love to visit?

- What do you like best about living/working near a school?

- What is your favorite foods? Where do you go for lunch?

❑ **<u>Interview through Stories and Conversations:</u>**

Example:
- Describe his/her family's fishing trip experience.
- Swimming footwear

INTERVIEWS – DESIGNING QUESTIONS

Class Activity: Design questions for understanding the needs of a child pertaining to her room furniture design.

In 3 minutes, I will call out randomly to listen from you.

INTERVIEWS – IDENTIFYING END USER

Can you identify the **ONE** target user market for the following brands/ products, and mention how you'll approach the market to get interviews:

1. Maggi
2. Iphone
3. Fitbits
4. Filter coffee
5. Walking stick
6. Pendulum clocks
7. White boards
8. Drilling tool

INTERVIEWS - PRACTICE

Class Activity: Two of you kindly volunteer. One person would be the interviewer, and other the interviewee.

The goal of the interviewer is to understand the user preference/ difficulties pertaining to 'masks'

INTERVIEWS - PRACTICE

Class Activity: Two of you kindly volunteer. One person would be the interviewer, and other the interviewee.

The goal of the interviewer is to understand the user preference/ difficulties pertaining to 'wrist watch'

INTERVIEWS – TAKE HOME EXERCISE

Take home Activity:

Interview 3 old people (>70 years of age) about what kind of a mobile phone they would like.
Think and write down the questions.
Conduct the interview and note down your findings.

OBSERVATIONS

- Observing users in their world gives you the opportunity to empathize with their experience, understand their context, uncover hidden needs and hear their honest and unfettered feedback.

- Observation also requires taking on a beginner's mindset. Ask lots of "why" questions.

- A successful observation looks upon the customer's world with curiosity and records all the details

- Types:

a) Controlled observation in lab settings – easy to conduct, analyze and reproduce,

b) Naturalistic observation – more reliable, difficult to conduct

OBSERVATIONS

- What are users actually doing? As opposed to what you expected they might do.

- What routines do users have with the product? How are they integrating it into their lives?

- Ensure you're examining activities in their whole in the flow of their lives, not just the product itself;

- Don't be afraid to get quantitative.

IMMERSION

Finding the origin of the problem, by getting close to the problem.

The team seeks to dive into the implications of the challenge, studying it from both the company's and user's perspective.

Immersion may be divided into two parts:

• Preliminary, when there is first contact with the problem;

•In-Depth, when we start to identify the needs and opportunities that will guide the generation of solutions in the following phase of the project, Ideation.

RESEARCH

Research is crucial type of empathy work.

- Research will be conducted at all phases. It is important to know what is the research and how to conduct for each phase.

- Research at empathize phase needs to focus on gaining information about the design challenge as well as the users they are designing for.

- Understand the demographic

- Understand the statistics pertaining to the problem tackled by the design

EMPATHY MAP

What does this person feel and think?

What does this person hear?

What does this person see?

What does this person do and say?

Frustration?

Desire?
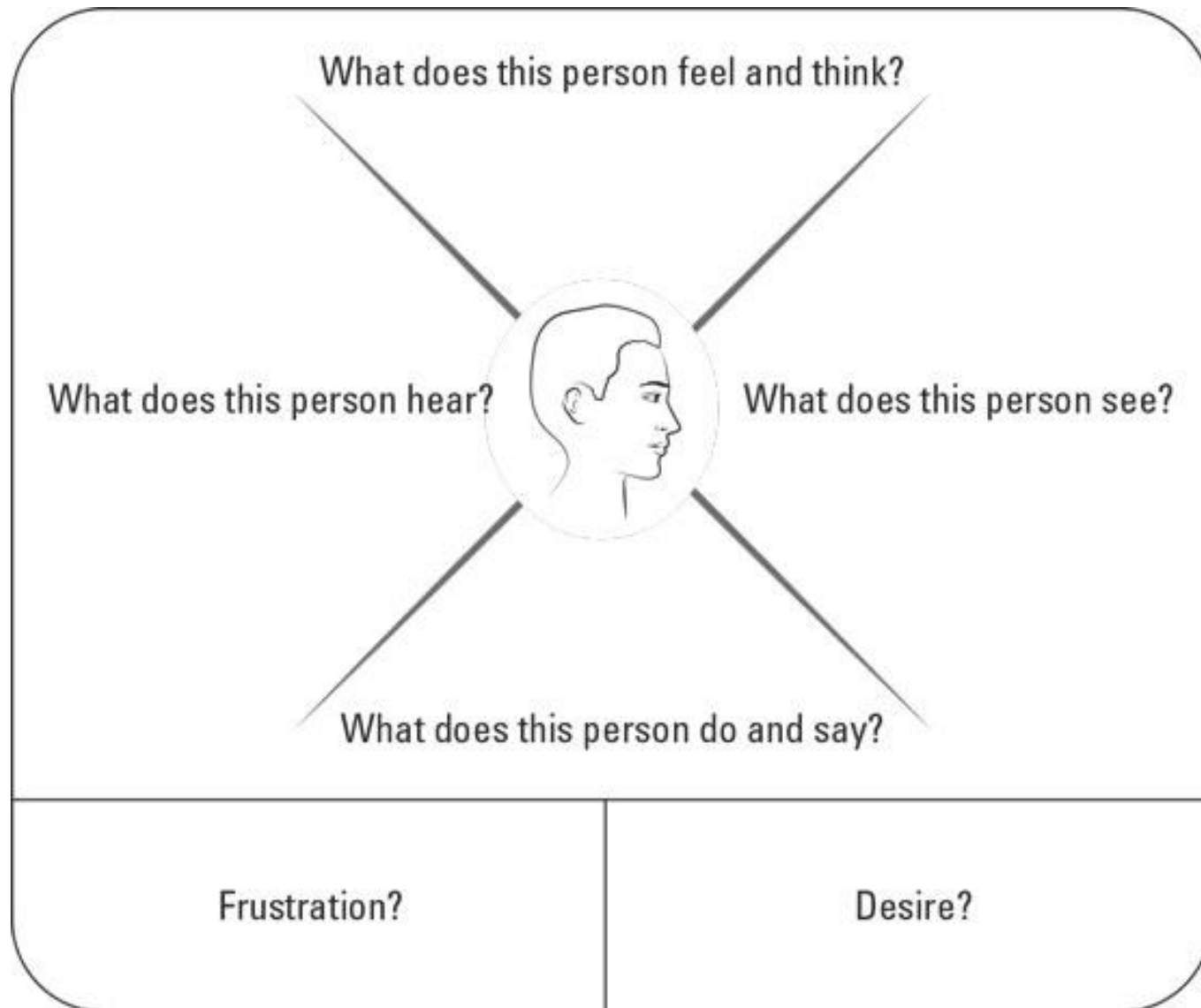
Build an empathy map for any design problem that you can think of.

EMPATHY MAP

It is a graphic organizer that visually displays and classifies the information captured during the empathy work.

1. Who are we empathizing with? – context and role of user

2. What do they need? – pertaining to the product/ service design

3. What do they see? – in physical environment/ outside (that can influence)

4. What do they say? – verbally and body language

5. What do they do? – their routine, and how the design helps

6. What do they hear? – from others/ second hand

7. What do they think and feel? – their frustrations and so on

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EMPATHY MAP

GOAL

1 **WHO are we empathizing with?**

Who is the person we want to understand?
What is the situation they are in?
What is their role in the situation?

2 **What do they need to DO?**

What do they need to do differently?
What job(s) do they want or need to get done?
What decision(s) do they need to make?
How will we know they were successful?

7 **What do they THINK and FEEL?**

PAINS

What are their fears,
frustrations, and anxieties?

GAINS

What are their wants,
needs, hopes and dreams?

3 **What do they SEE?**

What do they see in the marketplace?
What do they see in their immediate environment?
What do they see others saying and doing?
What are they watching and reading?

6 **What do they HEAR?**

What are they hearing others say?
What are they hearing from friends?
What are they hearing from colleagues?
What are they hearing second-hand?

What other thoughts and feelings might motivate their behavior?

4 **What do they SAY?**

What have we heard them say?
What can we imagine them saying?

5 **What do they DO?**

What do they do today?
What behavior have we observed?
What can we imagine them doing?

EMPATHY MAP

Take home activity –Fill (based on your imagination – as currently you can't go and conduct interview) a empathy map for the design of solar panel in the roof of a rural villager.

PROJECTS

Take home activity: Work on one of the three topics given below

1. How will you design a toll that will help create a solution to a problem at school?

2. How will you as float designers build a model float that celebrates an Indian holiday?

3. How will you as toy lab inventors design a nature-inspired toy for kinder garden students?

4. How will you as urban planners design a city plan to improve the local community?

DEFINE PHASE

DEFINE PHASE

- Students synthesize the information they found in the empathy work to develop a problem statement.

- Problem statement identifies the users, their needs, and any insights that can provide design opportunities

Define

Define the problem.

✓ NEEDS: User's emotional or physical necessities and desires that come in form of verbs.

✓ INSIGHTS: Remarkable realizations that could be leveraged to better respond to a design challenge.

DEFINE PHASE: SYNTHESIS

Finding needs and structuring insights

- Note down the observations from empathy work
- Group the observations and give them category titles

- For the findings – identify and associate what causes that behavior
- Structure the insight – Finding + what causes the behavior

FINDING	INSIGHT
Community members drive to other locations for food and entertainment	
Community members like to visit places of relaxation during weekends	
Very few Community members have been vaccinated	
Community members are traveling to stay in other locations during covid lockdown	

DEFINE PHASE: SYNTHESIS

FINDING	INSIGHT
Community members drive to other locations for food and entertainment	Community members drive to other locations for food and entertainment because there are not many options in their area
Community members like to visit places of relaxation during weekends	Community members like to visit places of relaxation during weekends as they are exhausted by work/ travel
Very few Community members have been vaccinated	Very few Community members have been vaccinated because of fear, as there was fake news spreading in the area
Community members are traveling to stay in other locations during covid lockdown	Community members are traveling to stay in other locations during covid lockdown as there are very few hospitals in this area

DEFINE PHASE: SYNTHESIS

❖ **INSIGHT**

- Does the insight inspire your students to start designing for the problem?

- Do you have a story that you can use to explain your insight?

- Is your insight interesting, surprising, or new?

- Does the insight have the potential to affect the design?

- Is the insight relevant to the context of the design challenge?

➢ Group the observations, and write down the needs. Then write the findings and structure it to insights.

➢ Do this for any take home activity that you had done earlier.

DEFINE PHASE: PROBLEM STATEMENT DEFINITION

ACTIONABLE PROBLEM STATEMENT

"_____ (user) might need a way to _____ (user's need) that // because // but _____ (insights)."

- Problem statement is different from the driving question.

- Problem statement is developed by the student designer after gaining understanding of the end users through empathy work/ research on literature.

- Problem statement shouldn't be too specific – as it will lead to fewer options for solution

DEFINE PHASE: PROBLEM STATEMENT DEFINITION

INSIGHT	PROBLEM STATEMENT
Community members drive to other locations for food and entertainment because there are not many options in their area	
Community members like to visit places of relaxation during weekends as they are exhausted by work/ travel	
Very few Community members have been vaccinated because of fear, as there was fake news spreading in the area	
Community members are traveling to stay in other locations during covid lockdown as there are very few hospitals in this area	

DEFINE PHASE: PROBLEM STATEMENT DEFINITION

INSIGHT	PROBLEM STATEMENT
Community members drive to other locations for food and entertainment because there are not many options in their area	Residents need a way to access a greater variety of restaurants and entertainments that does not require them to drive to other locations
Community members like to visit places of relaxation during weekends as they are exhausted by work/ travel	Business people and students need a way to rest and relax because of their 8-9 hour everyday work
Very few Community members have been vaccinated because of fear, as there was fake news spreading in the area	Uneducated mobile phone users need to have better news sources about vaccines as there is a lot of fake news spreading
Community members are traveling to stay in other locations during covid lockdown as there are very few hospitals in this area	Residents need primary health care centers that is effectively working during the pandemic as they are scared about the lack of hospitals

EXAMPLE: PROBLEM STATEMENT DEFINITION

City Plan

- Residents (users) need a way to access a greater variety of restaurants and entertainment (need) that does not require them to drive to other locations (insight).

- Business people and students (users) need a way to rest and relax (need) because, surprisingly, they work or study for eight to nine hours each day (insight).

- Older community members (users) need a way to exercise (need) because they are conscious of their health (insight).

EXAMPLE: PROBLEM STATEMENT DEFINITION

Design Thinking Club

- Mrs. Trinh (user) needs a tool to put up displays onto her wall (need) because of her height, but she will need it to be safe and portable for small spaces (insights).

- Mr. Persaud (user) needs a way to organize his desk (need) because of his numerous documents and office supplies that cover his workspace, but surprisingly, it should deter people from bringing nuts in his office due to his allergic reaction (insights).

- Students and teachers (user) need a way to leave the Performance Art Center and get to their classes faster (need) because massive traffic forms in the lobby, surprisingly due to there being only one lobby exit for 24 classes to use (insights).

EXAMPLE: PROBLEM STATEMENT DEFINITION

Toy Lab

- Kindergartners (users) need a toy or a game (need) that incorporates activities that they enjoy playing (moving toys, pretend play, building things, etc.) and are appropriate for their level of fine motor skills (insight).

Festival Float

- People who've had exposure to the festival (user) need a way to experience a festival float (need) that will ignite wistful memories related to the festival from their past (insight).

DEFINE PHASE: HOW MIGHT WE

- Modify the problem statement to a 'how might we' question.

- This is a start of the creative process and ignites students to begin taking steps in using their imagination to develop creative solutions.

- The question suggests that the answer is unknown.

- The 'we' suggests collaborative activity.

DEFINE PHASE: ACTIVITY

- Add observations, and find the needs and insights.

- Then write two problem statements, then modifying it to 'how might we' question. (one of it should lead to a hardware design, one a service design).

DEFINE PHASE: ACTIVITY

1. Healthcare workers are not getting 3rd dose in time.

2. Many healthcare workers are dying due to the pandemic.

3. The hospitals and the healthcare workers are overwhelmed by the number of patients.

4. The healthcare workers involved in treating cancer/ TB and other diseases don't have patients due to pandemic.

5. When there is lockdown, healthcare workers find it difficult to commute.

6. …..

SUMMARY

EMPATHIZE PHASE: **Identifying with the user**

- Be aware of the bias that you have
- Conduct interviews: Design broad questions, identify the end user, and conduct the interview

- Take down the observations

- Immerse yourself in the problem to identify the root

- Conduct research to gather more information about the design question

- Build an empathy map

DEFINE PHASE: **Identifying the need**

- Synthesize needs and insights: Group the observation and identify the needs. Structure it with cause of user behavior to get insight.

- Build an actionable problem statement.

- Modify it to 'how might we' question

Sample Question paper

AEC16 – Design thinking CIE 1

Portions: L1 to L4 - Unit 1 and 2

Question paper pattern:

Section I: Objective One-mark Questions

Answer any 8 questions out of the given 10 questions   8 x 1 = 8 marks

E.g.1. Which of the following is not a guideline for interview?
        a) Speak clearly
        b) Ask broad questions
        c) Interrupt and stop if they tell stories
        d) Take notes of their responses

E.g.2. Which of the following is not a part of empathy map?
        a) What does a person own
        b) What does a person hear
        c) What does a person do
        d) What does a person feel

Section II: Descriptive Questions

Answer any 3 questions out of the given 5 questions   3 x 4 = 12 marks

E.g.3. Define design thinking.
E.g.4. According to K12 Lab network, what are the key design thinking mindsets?

Section III: Applied Questions

Answer any 2 questions out of the given 3 questions   2 x 5 = 10 marks

E.g.5. As a part of Karnataka slum development board, **write down a list of questions** that can be asked to children (ages 8 to 15) to empathize with them and identify their needs.

E.g.6. Given the following set of observations and insights, **write down 1 problem statement** and modify it to 'How might we' question.

E.g.7. **Identify the error** in the following problem statement, and comment on the same.

Sample Questions

1. Explain the seven survival skills in brief.

2. What is Design Thinking? Why it matters?

3. Define Design Thinking and Designer.

4. Explain how design thinking for business is beneficial.

5. Explain design thinking for education and why it matters.

6. Explain the benefits of using the DT process and how DT can help the students.

7. Write down the observation when students attempts to solve problem using the DT.

8. What is Mindsets? Explain six key Mindsets in brief.

9. Explain other important Mindsets for success in brief.

- **References:**
- **David Lee, Design Thinking in the Classroom, Ulysses Press, Korea, 2018**

Thank You…

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