LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY

(A UGC AUTONOMOUS INSTITUTION)

Approved by AICTE/Affiliated OU/Estd.2002

Accredited 'A' Grade by NAAC,Accredited by NBA

DESIGN THINKING LAB

B.E I/I SEMESTER

LABORATORY OBSERVATION CUM MANUAL

Name of the Student: _____

Roll. No:_____

Branch/Section:_____

LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY

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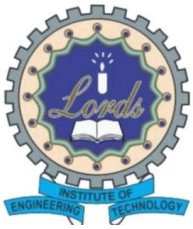

CERTIFICATE

This is to Certify that this is a bonafide record work in …… Laboratory by Mr./ Ms……. ……. bearing H.T. No…….. during the I /II Semester of B.E / M.E. / M.B.A ……Year for the academic Year 20…..-20…….

Signature of the Head of the Department Signature of Teacher Incharge

Submitted for the University Practical Examination held on ……..

Examiners

Date: Internal……..

External……..

INDEX

S.No	Date	Name of the Activity	Marks	Faculty Signature

LORDS INSTITUTE OF ENGINEERING & TECHNOLOGY [A]

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Vision

Lords Institute of Engineering and Technology strives for excellence in professional education through quality, innovation and teamwork and aims to emerge as a premier institute in the state and across the nation.

Mission

- To impart quality professional education that meets the needs of present and emerging technological world.
- To strive for student achievement and success, preparing them for life, career and leadership.
- To provide a scholarly and vibrant learning environment that enables faculty, staff and students to achieve personal and professional growth.
- To contribute to advancement of knowledge, in both fundamental and applied areas of engineering and technology.
- To forge mutually beneficial relationships with government organizations, industries, society, and the alumni.

DEPARTMENT OF SCIENCE AND HUMANITIES

DESIGN THINKING LAB

PREFACE

Design thinking is a broader framework that borrows methods from human-centered design to approach problems beyond the design discipline. It encourages people with different backgrounds and expertise to work together and apply the designer's way of thinking to generate innovative solutions to problems.

Design thinking is a methodology that designers use to brainstorm and solve complex problems related to designing and design engineering. It is also beneficial for designers to find innovative, desirable and never-thought-before solutions for customers and clients.

Design thinking is used extensively in the area of healthcare and wellness, agriculture, food security, education, financial services, and environmental sustainability, to name a few. Design thinking has helped in the digital space, contributed to the development of physical products, spurred social innovation projects and much more.

The iterative design process helps the designers to involve clients and customers in meaningful ways. It is not just a strategy to come up with feasible solutions to a problem, but also a method to think of unimaginable solutions and then trying to make them not just feasible, but also viable.

Design thinking is a blend of logic, powerful imagination, systematic reasoning and intuition to bring to the table the ideas that promise to solve the problems of the clients with desirable outcomes. It helps to bring creativity with business insights.

The teaching and acquisition of design thinking skills have assumed so much importance that it is now being taught at some of the leading universities of the world, as well as the leading global corporate houses across the globe.

The lab helps the students to develop new ways of creative thinking and learn the innovation cycle of design thinking process for developing innovative products.

Propose real-time innovative engineering design and choose appropriate frameworks, strategies, techniques during prototype development.

Prepared by
RESHMA BUSHRA GHOURI
ASST. PROFESSOR
Department of English

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S.No.	Program Outcomes (POs)
1.	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2.	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3.	**Design/Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4.	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5.	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6.	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7.	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8.	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms ofthe engineering practice.
9.	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11.	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12.	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course code	Course title						Core/Elective
U23EN1L2	**Design Thinking Lab (Common to all Branches)**						**Core**
Pre-requisites	Contact Hours Per Week				CIE	SEE	Credits
	L	T	D	P			
--	-	-	-	2	25	50	1

Course Objectives:

1. To provide the new way of creative thinking
2. To learn the innovative cycle of design thinking process
3. To develop an understanding of prototype and testing
4. To encourage the understanding, acceptance and appreciation of individual differences
5. To solve practical Engineering problems through innovative product design and creative solution

Course Outcomes:

On completion of this course, the student will be able to:

1. Compare and classify the various learning styles and memory techniques and apply them in their engineering education
2. Analyze emotional experience and inspect emotional expressions to better understand users while designing innovative products
3. Develop new ways of creative thinking and learn the innovation cycle of design thinking process for developing innovative products
4. Propose real-time innovative engineering design and choose appropriate frameworks, strategies, techniques during prototype development
5. Perceive individual differences and its impact on everyday decisions and further create a better customer experience

Unit 1: a) An Insight to Learning

Understanding the Learning Process, Kolb's Learning Styles, Assessing and Interpreting

b) Remembering Memory

Understanding the Memory process, Problems in retention, Memory enhancement techniques

Unit 2: a) Emotions: Experience & Expression

Understanding Emotions: Experience & Expression, Assessing Empathy, Application with Peers

b) Being Ingenious & Fixing Problem

Understanding Creative thinking process, Understanding Problem Solving, Testing Creative Problem Solving

Unit 3: Basics of Design Thinking

Definition of Design Thinking, Need for Design Thinking, Objective of Design Thinking, Concepts & Brainstorming, Stages of Design Thinking Process (explain with examples) – Empathize, Define, Ideate, Prototype, Test

Unit 4: Process of Product Design

Process of Engineering Product Design, Design Thinking Approach, Stages of Product Design, Examples of best product designs and functions, Assignment – Engineering Product Design

Unit 5: a) Prototyping & Testing

What is Prototype? Why Prototype? Rapid Prototype Development process, Testing, Sample Example, Test Group Marketing

b) Celebrating the Difference

Understanding Individual differences & Uniqueness, Group Discussion and Activities to encourage the understanding, acceptance and appreciation of Individual differences

Unit 6: a) Design Thinking & Customer Centricity

Practical Examples of Customer Challenges, Use of Design Thinking to Enhance Customer Experience, Parameters of Product experience, Alignment of Customer Expectations with Product Design

b) Feedback, Re-Design & Re-Create

Feedback loop, Focus on User Experience, Address "ergonomic challenges, User focused design, rapid prototyping & testing, final product, Final Presentation – **"Solving Practical Engineering Problem through Innovative Product Design & Creative Solution".**

Text/Reference Books:

1. E Balaguruswamy (2022), Developing Thinking Skills (The way to Success), Khanna Book Publishing Company.
2. Thiel P, Zero to One: Note on Start-Ups, or How to Build the Future, Random House ,2018
3. Ries Eric, The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, Penguin Group,2011
4. Soni Pavan, Design Your Thinking, Penguin Random House India Private Limited, 2020

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COURSE: Design Thinking Lab

COURSE CODE: U23EN1L2
COURSE OUTCOMES (CO): C19

Course Outcomes	Statement	Bloom's Taxonomy
C19.1	Compare and classify the various learning styles and memory techniques and apply them in their engineering education	BTL-2
C19.2	Analyse emotional experience and inspect emotional expressions to better understand users while designing innovative products	BTL-3
C19.3	Develop new ways of creative thinking and learn the innovation cycle of design thinking process for developing innovative products	B TL-2
C19.4	Propose real-time innovative engineering design and choose appropriate frameworks, strategies, techniques during prototype development	BTL-2
C19.5	Perceive individual differences and its impact on everyday decisions and further create a better customer experience	BTL-2

Note: Bloom's Taxonomy Levels

BTL1-Remember	BTL2 – Understand	BTL3 –Apply
BTL4-Analyze	BTL5 –Evaluate	BTL6–Create

Faculty In charge

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MAPPING

Course Articulation Matrix:

Course Title: Design Thinking Laboratory	Year & Semester: I Year I Semesters
Course Code: U23EN1L2	Year: 2023-24

Mapping of Course Outcomes (CO) with Program Outcomes (PO) and Program Specific Outcomes (PSO's)

COs	Program Outcomes (POs)												(PSO's)	
C19	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C19.1		1	1							2		1		1
C19.2			1							1		1		1
C19.3						1				1		1	1	
C19.4					1					1		2	1	
C19.5						1			2	2		2	1	
C19		1	1		1	1			2	1.4		1.4	1	1

DegLevel: 1- Low correlation (Low), 2- Medium correlation (Medium), 3-High correlation (High)

PO1: Engineering knowledge, **PO2:** Problem analysis, **PO3:** Design/Development of solutions, **PO4:** Conduct investigations of complex problems, **PO5:** Modern tool usage, **PO6:** The engineer and society, PO**7:** Environment and sustainability, **PO8:** Ethics, **PO9:** Individual and teamwork, **PO10:** Communication, **PO11:** Project management and finance, **PO12:** Life-long learning
PSO1: Professional Skills, **PSO2:** Problem-Solving Skills

Faculty Incharge

DISTRIBUTION AND WEIGHTAGE OF MARKS

DESIGN THINKING LAB

Practical Examination

The practical examinations for the Design Thinking Laboratory shall be conducted as per the University norms prescribed by AICTE model curriculum .

Continuous Internal Evaluation (CIE):

CIE shall be conducted for 25 marks out of which 15 marks for day-to-day performance including attendance, timely submission of lab observations & records,viva-voce,10 marks for internal lab exam and viva-voce.

Semester End Examination (SEE):

SEE shall be conducted for 50 marks out of which 10 marks are allocated for the write-up(design/procedure/schematic diagram)of the given experiment,20 marks for conduction of experiment, 10 marks for results and 10 marks for viva-voce with a duration of 3 hours.

CODE OF CONDUCT

- Students should bring lab Manual/Record for every laboratory session and enter the lab in time.
- Students should follow professional dress code.
- The group- wise division made in the beginning should be adhered to, and no mixup of students among different groups will be permitted later.
- After completion of the activity, certification of the concerned staff in–charge in the observation book is necessary.
- Students should be present in the labs for the total scheduled duration.
- Students should not carry any food items inside the laboratory.
- Use of cell phones and IPODs is forbidden.
- Students should not write on or deface furniture, or any equipment provided to them during the experiment.
- Every student should keep his/her work area properly before leaving the laboratory.

WORKSHEET 1

UNIT- 1 An Insight to Learning

1.1) INTRODUCTION

There are 4 predominant learning styles: Visual, Auditory, Read/Write, and Kinaesthetic. While most of us may have some general idea about how we learn best, often it comes as a surprise when we discover what our predominant learning style is.

Learning styles are theories describing individual preferences for how we like to learn and how we best retain new information.

a) Why identify your learning style?

Identifying your learning style involves understanding how you tend to learn best. You can use this information to your advantage when you study by using learning approaches that work well for you, such as writing out notes, creating mind-maps, using models or reciting out loud. This can assist you with in-class learning and with examination revision.

b) The different learning styles

There are many different learning style models that attempt to explain differences in learning between individuals. One of the most widely known is the VARK model, which includes the Visual, Auditory, Read/write and Kinaesthetic learning styles – these are detailed below. Reflect on which activities you tend to prefer when studying to determine which learning style you tend to use. Note that you may utilise more than one learning style.

i)Visual

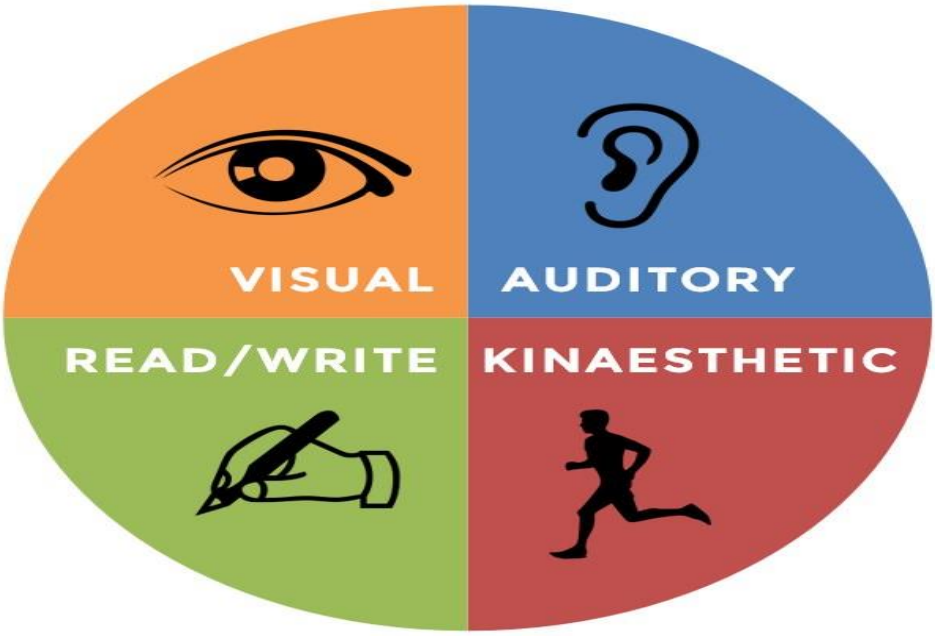
Visual learners learn by sight. These learners benefit from:

- Images and diagrams
- Graphics and visuals
- Charts
- Maps
- Mind-maps
- Flash cards

ii)Auditory

Auditory learners learn by hearing. These learners benefit from:

- Listening
- Speaking
- Group discussions
- Verbal repetition
- Sound recordings
- Mnemonic devices



iii)Read/Write

Read/write learners learn by reading and writing. These learners benefit from:

- Reading
- Writing
- Making detailed notes
- Re-writing notes to revise
- Viewing information in word form

iv)Kinaesthetic

Kinaesthetic learners learn by touch. These learners benefit from:

- Movement
- Tactile representations
- Models and materials
- Physical interactions
- Hands-on approaches
- Experience and practice

1.2)Understanding the Learning Process to Effectively Differentiate Instruction

The underlying ability a teacher must have to orchestrate differentiated instruction day after day, hour after hour, by assessing his/her students and adjusting strategies and tactics moment by moment, requires sophisticated knowledge and skills.

There are six interactive components of the learning process: *attention, memory, language, processing and organizing, graphomotor* (writing) and *higher order thinking*. These processes interact not only with each other, but also with emotions, classroom climate, behavior, social skills, teachers and family.

In order to engage, motivate and teach all learners at optimal levels, teachers must understand the learning process in general, understand and respond to students' individual emotional and cognitive profiles and select instructional strategies and tactics that are effective for diverse learners.

a)Attention

Paying attention is the first step in learning anything. It is easy for most of us to pay attention to things that are interesting or exciting to us.

b)Memory

Memory is the complex process that uses three systems to help a person receive, use, store, and retrieve information. The three memory systems are (1) short-term memory (e.g., remembering a phone number you got from information just long enough to dial it), (2) working memory (e.g., keeping the necessary information "files" out on the mind's "desktop" while performing a task such as writing a paragraph or working a long division problem), and (3) long-term memory (a mind's ever expanding file cabinet for important information we want to retrieve over time).

c)Language

Language is the primary means by which we give and receive information in school. The two language processing systems are *expressive* and *receptive*. We use expressive language when we speak and write, and we use receptive language when we read and listen.

All students will benefit from systematic, cumulative, and explicit teaching of reading and writing.

d)Organization

We process and organize information in two main ways: *simultaneous* (spatial) and *successive* (sequential). Simultaneous processing is the process we use to order or organize information in space. Having a good sense of direction and being able to "see" how puzzle pieces fit together are two examples of simultaneous processing. Successive processing is what we use to order or organize information in time and sequence. Concepts of time, dates, and order – yesterday, today, and tomorrow, months of the year, mathematical procedures such as division and multiplication, word order in sentences, and sentence order in paragraphs are examples of sequential processing.

e)Graphomotor

The writing process requires neural, visual, and muscular coordination to produce written work. It is not an act of will but rather an act of coordination among those functions.

Students with handwriting difficulties may benefit from the opportunity to provide oral answers to exercises, quizzes, and tests. Having computers in place for all children helps level the playing field for the graphomotor klutz. Parents and teachers should be aware, however, that many children with graphomotor challenges may also have difficulty with the quick muscular coordination required by the keyboard.

f)Higher Order Thinking

Higher order thinking (HOT) is more than memorizing facts or relating information in exactly the same words as the teacher or book expresses it. Higher order thinking requires that we do something with the facts. We must understand and manipulate the information.

HOT includes concept formation; concept connection; problem solving; grasping the "big picture"; visualizing; creativity; questioning; inferring; creative, analytical and practical

thinking; and metacognition. *Metacognition* is thinking about thinking, knowing about knowing, and knowing how you think, process information, and learn.

Psychologist Robert Sternberg lists six components of mental self-management:

1. Know your strengths and weaknesses.
2. Capitalize on your strengths and compensate for your weaknesses.
3. Defy negative expectations.
4. Believe in yourself (self-efficacy).
5. Seek out role models.
6. Seek out an environment where you can make a difference.

Activity 1

1. **Paste the pictures of different means of transport and list them**

2. **Write some details of a person whom you admire in your family(in about 100 words).**

3.List the names of items displayed.

WORKSHEET 2

1.3)Kolb's Learning Styles and Experiential Learning:-

David Kolb, an American psychologist, professor and education theorist. Kolb was born in 1939 and earned his undergraduate degree from Knox College in 1961. He then earned a PhD in social psychology from Harvard University.

David Kolb published his learning styles model in 1984, from which he developed his learning style inventory.

Kolb's experiential learning theory works on two levels: a four-stage cycle of learning and four separate learning styles. Much of Kolb's theory is concerned with the learner's internal cognitive processes.

Kolb states that learning involves the acquisition of abstract concepts that can be applied flexibly in a range of situations. In Kolb's theory, the impetus for the development of new concepts is provided by new experiences.

"Learning is the process whereby knowledge is created through the transformation of experience"

The Experiential Learning Cycle

Effective learning is seen when a person progresses through a cycle of four stages: of (1) having a concrete experience followed by (2) observation of and reflection on that experience which leads to (3) the formation of abstract concepts (analysis) and generalizations (conclusions) which are then (4) used to test a hypothesis in future situations, resulting in new experiences.

Kolb's experiential learning style theory is typically represented by a four-stage learning cycle in which the learner "touches all the bases":

1. **Concrete Experience** – the learner encounters a concrete experience. This might be a new experience or situation, or a reinterpretation of existing experience in the light of new concepts.
2. **Reflective Observation of the New Experience** – the learner reflects on the new experience in the light of their existing knowledge. Of particular importance are any inconsistencies between experience and understanding.

3. **Abstract Conceptualization** – reflection gives rise to a new idea, or a modification of an existing abstract concept (the person has learned from their experience).
4. **Active Experimentation** – the newly created or modified concepts give rise to experimentation. The learner applies their idea(s) to the world around them to see what happens.

Effective learning is seen when a person progresses through a cycle of four stages: of (1) having a concrete experience followed by (2) observation of and reflection on that experience which leads to (3) the formation of abstract concepts (analysis) and generalizations (conclusions) which are then (4) used to test a hypothesis in future situations, resulting in new experiences.

Kolb (1984) views learning as an integrated process, with each stage mutually supporting and feeding into the next. It is possible to enter the cycle at any stage and follow it through its logical sequence.

However, effective learning only occurs when a learner can execute all four stages of the model. Therefore, no one stage of the cycle is effective as a learning procedure on its own.

The process of going through the cycle results in the formation of increasingly complex and abstract 'mental models' of whatever the learner is learning about.

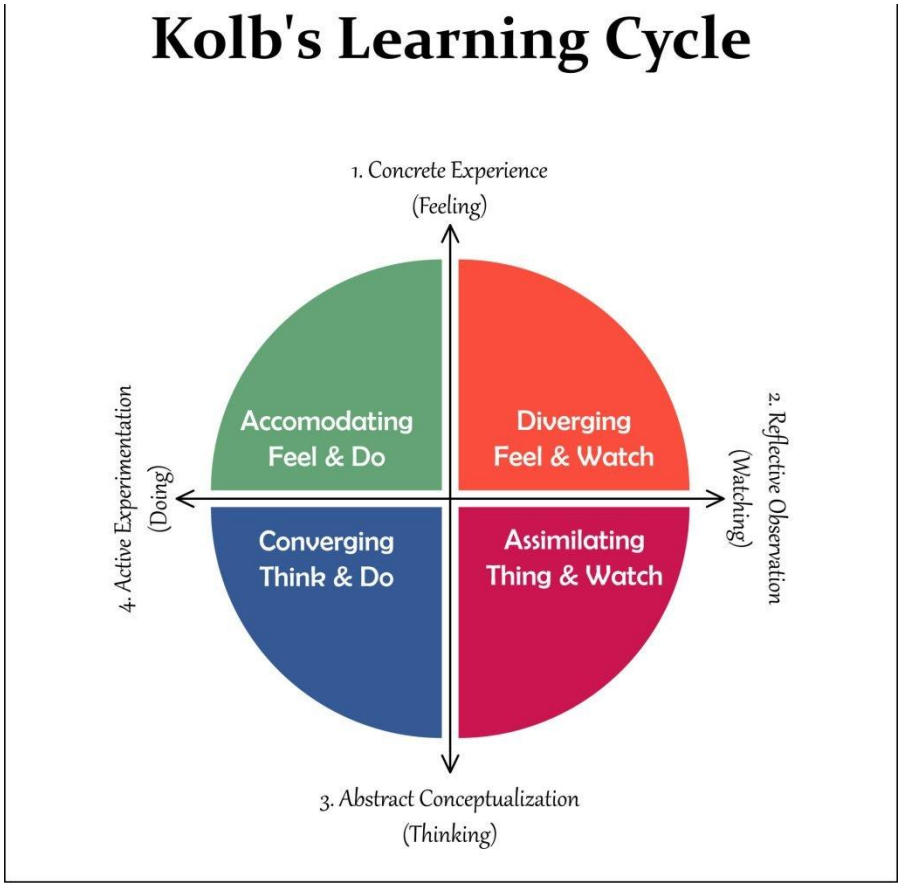
Kolb's Reflective Cycle

Kolb's learning theory (1984) sets out four distinct learning styles, which are based on a four-stage learning cycle (see above). Kolb explains that different people naturally prefer a certain single different learning style.

Various factors influence a person's preferred style. For example, social environment, educational experiences, or the basic cognitive structure of the individual.

Whatever influences the choice of style, the learning style preference itself is actually the product of two pairs of variables, or two separate "choices" that we make, which Kolb presented as lines of an axis, each with "conflicting" modes at either end.

A typical presentation of Kolb's two continuums is that the east-west axis is called the Processing Continuum (how we approach a task), and the north-south axis is called the Perception Continuum (our emotional response, or how we think or feel about it).



Kolb believed that we cannot perform both variables on a single axis at the same time (e.g., think and feel). Our learning style is a product of these two choice decisions.

It's often easier to see the construction of Kolb's learning styles in terms of a two-by-two matrix. Each learning style represents a combination of two preferred styles.

The matrix also highlights Kolb's terminology for the four learning styles; diverging, assimilating, and converging, accommodating:

	Active Experimentation (Doing)	Reflective Observation (Watching)
Concrete Experience (Feeling)	Accommodating (CE/AE)	Diverging (CE/RO)
Abstract Conceptualization (Thinking)	Converging (AC/AE)	Assimilating (AC/RO)

Learning Styles Descriptions

Knowing a person's (and your own) learning style enables learning to be orientated according to the preferred method.

That said, everyone responds to and needs the stimulus of all types of learning styles to one extent or another – it's a matter of using emphasis that fits best with the given situation and a person's learning style preferences.

Here are brief descriptions of the four Kolb learning styles:

Diverging (feeling and watching – CE/RO)

These people are able to look at things from different perspectives. They are sensitive. They prefer to watch rather than do, tending to gather information and use imagination to solve problems. They are best at viewing concrete situations from several different viewpoints.

Kolb called this style "diverging" because these people perform better in situations that require ideas-generation, for example, brainstorming. People with a diverging learning style have broad cultural interests and like to gather information.

They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts. People with the diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback.

Assimilating (watching and thinking – AC/RO)

The assimilating learning preference involves a concise, logical approach. Ideas and concepts are more important than people.

These people require good clear explanations rather than a practical opportunity. They excel at understanding wide-ranging information and organizing it in a clear, logical format.

People with an assimilating learning style are less focused on people and more interested in ideas and abstract concepts. People with this style are more attracted to logically sound theories than approaches based on practical value.

This learning style is important for effectiveness in information and science careers. In formal learning situations, people with this style prefer readings, lectures, exploring analytical models, and having time to think things through.

Converging (doing and thinking – AC/AE)

People with a converging learning style can solve problems and will use their learning to find solutions to practical issues. They prefer technical tasks, and are less concerned with people and interpersonal aspects.

People with a converging learning style are best at finding practical uses for ideas and theories. They can solve problems and make decisions by finding solutions to questions and problems.

People with a converging learning style are more attracted to technical tasks and problems than social or interpersonal issues. A converging learning style enables specialist and technology abilities.

People with a converging style like to experiment with new ideas, to simulate, and to work with practical applications.

Accommodating (doing and feeling – CE/AE)

The Accommodating learning style is "hands-on," and relies on intuition rather than logic. These people use other people's analysis, and prefer to take a practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans.

They commonly act on "gut" instinct rather than logical analysis. People with an accommodating learning style will tend to rely on others for information than carry out their own analysis. This learning style is prevalent within the general population.

Educational Implications

Both Kolb's (1984) learning stages and the cycle could be used by teachers to critically evaluate the learning provision typically available to students, and to develop more appropriate learning opportunities.

Educators should ensure that activities are designed and carried out in ways that offer each learner the chance to engage in the manner that suits them best.

Also, individuals can be helped to learn more effectively by the identification of their lesser preferred learning styles and the strengthening of these through the application of the experiential learning cycle.

Ideally, activities and material should be developed in ways that draw on abilities from each stage of the experiential learning cycle and take the students through the whole process in sequence.

1.3)What is called assessment?

Assessment is the systematic basis for making inferences about the learning and development of students. It is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development

The different dimensions of assessment of learning

This includes: ideas, memories, knowledge, skills, facts, and experiences. It's about making sense of these things in relation to each new context of learning and performance. It's also about being able to create a 'knowledge map'.

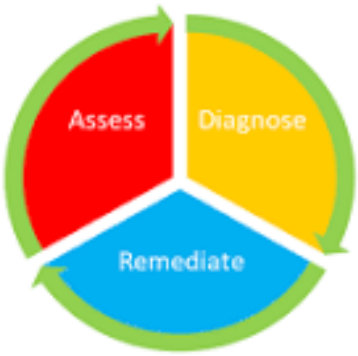
There are three types of assessment: diagnostic, formative, and summative. Although are three are generally referred to simply as assessment, there are distinct differences between the three.

What are the techniques of assessment?

There are seven techniques that can be used, the assessment of performance, attitude assessment, written assessment, project assessment, product assessment, the use of portfolios and self-assessment. Performance appraisal is an appraisal done by observing the activities of learners in doing something.

What are the 3 components of assessment?

There are three key elements of Assessment for Learning: assess, diagnose, and remediate. But it shouldn't stop there. The three key elements of Assessment for Learning are cyclical. After completing the last remediation step, you can assess the pupil again to determine if they have understood the concept.



What is the interpreting process?

"The process of first fully understanding, analyzing, and processing a spoken or signed message and then faithfully rendering it into another spoken or signed language."

What is assessment interpretation?

By setting expected results for the percentage of students meeting or exceeding performance standards before data collection begins, the program can gauge its effectiveness in helping students meet the learning outcomes.

Activity- 2

1.Paste pictures of different models of cars from any one company

2.Write the evolution process of mobiles from basic model to smartphone/Android /iOS.

3.Paste the pictures of phones from basic model to smartphone.

WORKSHEET 3

UNIT 1

b) Remembering Memory

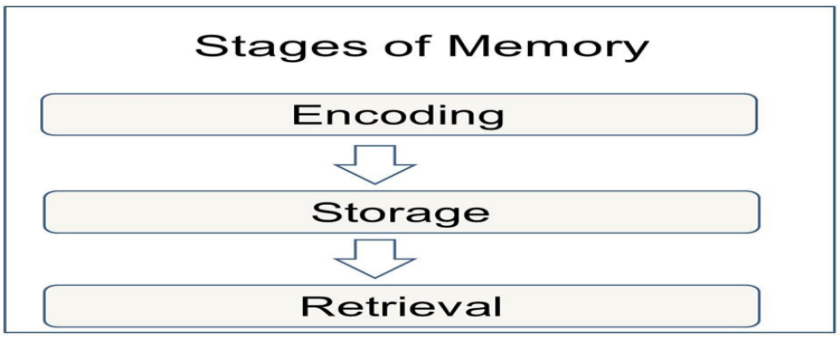
The following are steps of the memory process:-

There are three main processes that characterize how memory works. These processes are encoding, storage, and retrieval (or recall). Encoding. Encoding refers to the process through which information is learned.

1.3)Memory Stages: Encoding Storage and Retrieval

"Memory is the process of maintaining information over time. "Memory is the means by which we draw on our past experiences in order to use this information in the present.' Memory is the term given to the structures and processes involved in the storage and subsequent retrieval of information.

Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future do tomorrow. Without memory, we could not learn anything. Memory is involved in processing vast amounts of information. This information takes many different forms, e.g., images, sounds, or meaning.



a)Memory Encoding

When information comes into our memory system (from sensory input), it needs to be changed into a form that the system can cope with so that it can be stored.

Think of this as similar to changing your money into a different currency when you travel from one country to another. For example, a word that is seen (in a book) may be stored if it is changed (encoded) into a sound or a meaning (i.e., semantic processing).

There are three main ways in which information can be encoded (changed):

1. Visual (picture)

2. Acoustic (sound)

3. Semantic (meaning)

For example, how do you remember a telephone number you have looked up in the phone book? If you can see it, then you are using visual coding, but if you are repeating it to yourself, you are using acoustic coding (by sound).

Evidence suggests that this is the principle coding system in short-term memory (STM) is acoustic coding. When a person is presented with a list of numbers and letters, they will try to hold them in STM by rehearsing them (verbally).

Rehearsal is a verbal process regardless of whether the list of items is presented acoustically (someone reads them out), or visually (on a sheet of paper).

The principle encoding system in long-term memory (LTM) appears to be semantic coding (by meaning). However, information in LTM can also be coded both visually and acoustically.

b)Memory Storage

This concerns the nature of memory stores, i.e., where the information is stored, how long the memory lasts (duration), how much can be stored at any time (capacity) and what kind of information is held.

The way we store information affects the way we retrieve it. There has been a significant amount of research regarding the differences between Short Term Memory (STM) and Long Term Memory (LTM).

Most adults can store between 5 and 9 items in their short-term memory. Miller (1956) put this idea forward, and he called it the magic number 7. He thought that short-term memory capacity was 7 (plus or minus 2) items because it only had a certain number of "slots" in which items could be stored.

However, Miller didn't specify the amount of information that can be held in each slot. Indeed, if we can "chunk" information together, we can store a lot more information in our short-term memory. In contrast, the capacity of LTM is thought to be unlimited.
Information can only be stored for a brief duration in STM (0-30 seconds), but LTM can last a lifetime.

c)Memory Retrieval

This refers to getting information out of storage. If we can't remember something, it may be because we are unable to retrieve it. When we are asked to retrieve something from memory, the differences between STM and LTM become very clear.

STM is stored and retrieved sequentially. For example, if a group of participants is given a list of words to remember and then asked to recall the fourth word on the list, participants go through the list in the order they heard it in order to retrieve the information.

LTM is stored and retrieved by association. This is why you can remember what you went upstairs for if you go back to the room where you first thought about it.

Organizing information can help aid retrieval. You can organize information in sequences (such as alphabetically, by size, or by time). Imagine a patient being discharged from a hospital whose treatment involved taking various pills at various times, changing their dressing, and doing exercises.

1.4)Problems in Retention

Retention becomes a problem when an employee quotes an exceptionally high figure beyond the budget of the organization and is just not willing to compromise. The organization needs to take care of the interests of the other employees as well and can't afford to make them angry.
Memory and retention in learning
Human memory is the process in which information and material is encoded, stored and retrieved in the brain. Memory is a property of the central nervous system, with three different classifications: short-term, long-term and sensory memory. The three types of memory have specific, different functions but each are equally important for memory processes. Sensory information is transformed and encoded in a certain way in the brain, which forms a memory representation. This unique coding of information creates a memory.

Memory and retention are linked because any retained information is kept in human memory stores, therefore without human memory processes, retention of material would not be possible. In addition, memory and the process of learning are also closely connected. Memory is a site of storage and enables the retrieval and encoding of information, which is essential for the process of learning. Learning is dependent on memory processes because previously stored knowledge functions as a framework in which newly learned information can be linked.

a)Types of Memory

Long-term

Types of Long-term Memory

Long-term memory is the site for which information such as facts, physical skills and abilities, procedures and semantic material are stored. Long-term memory is important for the retention of learned information, allowing for a genuine understanding and meaning of ideas and concepts.[6] In comparison to short-term memory, the storage capacity of long-term memory can last for days, months, years or for an entire lifetime. Long term memory can still be forgotten so the information that is held here is constantly changing over time.

Short-term

Short-term memory is responsible for retaining and processing information very temporarily. It is the information that we are currently aware of thinking about. Short term memory is also known as the working memory. The storage capacity and duration of short-term memory is very limited; information can be lost easily with distraction.[2] A famous paper written by psychologist George Miller in 1956 analyses this concept further. Miller wrote how short-term memory only has the ability to process or hold seven, plus or minus two items at a time, which then expires after roughly 30 seconds.[2] This is due to short-term memory.

1.5)Techniques to Improve your Memory Effectively

The ability to recall important information can help keep you organized and give you an advantage in your life and career. Improving your memory is also an effective way to keep your brain healthy and active throughout your life. Learning basic memory-boosting techniques can help you retain more details and keep you focused on both personal and professional tasks.

Techniques to improve your memory

Try these 15 suggestions the next time you need to remember key information for a personal or professional task or to boost your overall recall abilities:

1. Use mnemonic rhymes

Mnemonics is the practice of assigning words or rhymes to represent information. Creating a rhyme that you either chant or sing aids the memory through auditory stimuli. Mnemonic rhymes match information with key details using words that sound the same. For example, some people remember the number of days in each month using this rhyme:

"30 days have September, April, June and November. All the rest have 31. February stands alone."

2. Try spaced repetition

The spaced repetition method involves reinforcing information in your mind just as it begins to fade to freshen the data in your mind. By reinforcing information at regular intervals, you're more likely to access the information when you need to remember it. Some people practice this method using flashcards, working through them at certain intervals and separating them into piles based on the difficulty of the information.

3. Chunk information

Chunking, or the memory tree method, is the process of classifying, or branching, things into groups. For example, if you want to remember a set of facts, relate them in your mind using a memory tree. Begin with the main branches first, then add leaves. You should label each branch and leaf in ways that are somehow meaningful to you and the facts or “leaves” should remain logically organized.

4. Create acronyms

Acronyms offer another mnemonic tool to enhance your memory. For example, use the NAME acronym to remember the names of contacts you meet or other important items. Here's an example of how the NAME acronym works:

Notice: Consciously and deliberately noticing things about a person, such as the color of their eyes or hair color.

Ask: When you engage yourself in a conversation by asking questions, it's often easier to remember the details.

Mention: A simple tip for remembering names or other facts is to say the information out loud repeatedly. This enlists our other senses to reinforce the memory.

Envision: Envisioning is part of the mnemonic process that involves associating the visual characteristics of a face with the person's name.

Acronyms often summarize important terms within a business or industry to help employees remember relevant processes or facts. You can also make your own meaningful acronyms to help recall pertinent information.

5. Improve your sleep

Sleep deprivation negatively affects a variety of cognitive abilities, including memory. Getting the recommended amount of quality sleep aids in procedural memory formation, which impacts learning new skills and helps with recalling stored information. As you sleep, your brain reorganizes memories, forming stronger connections between them while you snooze. This is also when your brain links new information to existing data, encouraging creativity in your waking hours.

6. Eat healthy food

Foods that enhance and maintain memory function include walnuts, green tea, blueberries, pumpkin seeds, fish, oysters, whole grains and olive oil. Even dark chocolate with low sugar content is known to increase brain function. These foods contribute to enhanced prefrontal activity, leading to better memory and cognition, and lower the risk of dementia by nearly half, while foods that are high in cholesterol can lead to memory loss.

7. Exercise regularly

Regular exercise increases blood flow to the brain, adding cognitive benefits such as alertness, better concentration and a positive mood. It doesn't have to be vigorous exercise—a cumulative three hours a week of walking is enough to experience some benefits. Adding exercise into your daily routine aids your brain function to increase memory. Try any of these gentle exercises that adhere to your health and lifestyle to enhance memory capabilities:

- Take a brisk walk through your neighborhood.
- Swim laps across a pool.
- Walk down the stairs of a parking garage instead of taking an elevator.
- Bike on a local trail.
- Participate in an in-person or virtual exercise class.

8. Socialize often

Studies have suggested that maintaining close relationships helps to improve memory as well as prevent memory loss through dementia and Alzheimer's disease. Making an effort to meet with friends for coffee or meals gives you a chance to practice active listening and memory recall as you discuss different topics about your lives. Both in-person and virtual groups can help you form connections with other individuals who share similar interests. Consider attending community events such as classes at your local library or trivia nights at your favorite restaurant.

9. Participate in hobbies

Like physical exercise, engaging your brain in challenging activities provides stimulation, preventing the formation of the protein that is said to cause Alzheimer's. Try challenging your

mind with a new hobby, such as learning a new language, studying a new subject, learning to play a musical instrument or playing thought-provoking games like chess. Actively engaging your body and mind in a hobby can stimulate cognitive function at any age.

10. Practice meditation

Studies show that meditating improves the brain's ability to focus on finer details. Practicing mindfulness by quieting your thoughts to focus on the moment can help keep your brain healthy. If you find sitting still for more than a couple of minutes challenging, take a meditative walk or sit in a calming place. Being outside in nature may improve your ability to calm down and focus on the moment.

11. Play brain games

Your brain is a muscle that needs exercise just like other parts of your body. Puzzles and logic games challenge your brain to think and make connections. Routine challenges keep your brain active and provide rigorous exercise in a fun way. Use digital brain games involving memory recall or pattern identification or physical games such as puzzles. Plenty of websites and apps offer daily brain games and a community of like-minded individuals trying to maintain a healthy memory.

12. Write down information

Even though digital tools can aid writing and note-taking, writing information down on paper helps your brain process information. As you write, actively focus on the key points you want to remember. This solidifies the information in your mind. Rereading notes to view the information also supports long-term memory retention. Consider using a notebook to record information as you take a class or participate in professional development, even if it's a virtual lesson.

13. Summon your interest

It's much easier to remember something when we're truly interested in the topic. Some people find it helpful to actively search for a reason to be interested, such as envisioning how they'll use the information in their job. The mindfulness required to do this signals your brain to send more resources to the neurons, strengthening them to reinforce the memory.

14. Remain attentive

Paying close attention to a topic or event helps the neural circuits in your brain form long-term memories. Higher levels of concentration allow your brain to absorb key information and convert short-term memories into long-term memories. Constant distractions from sources like social media, entertainment and even multitasking for work can make paying attention to one

thing challenging. To help your focus your attention, try making a checklist to focus your effort on one project at a time, moving on to the next only when you've finished the first. Eliminate or avoid distractions by using the following techniques:

- Designate a work or study space.
- Listen to brain-enhancing music in the background.
- Work with your phone out of reach.
- Use productivity apps to focus for periods of time.

15. Visualize the item

Picture yourself doing the action you want to remember. Use a graphic like a chart to comprehend important information. Organize topics by color or use different colored pens or highlighters to code information. Using visual cues gives your brain a memory aid as you recall information. You can even create a visualization to associate information with memorable items in your home or another familiar place. For example, if you visualize yourself walking through your kitchen, you may link a certain piece of information to opening up a cabinet or walking by the sink.

ACTIVITY - 3 : Debate

a) **Business Branding is essential or not.Discuss.**

b) Electric vehicles a boon or a bane.

WORKSHEET -4

1.5)HOW TO MEMORIZE FAST (AND WHY MOST MEMORIZATION TIPS SUCK)

It's not too difficult to learn how to memorize fast and easily – *if* you use the right strategies, that is.

But most people don't use the right strategies.

In fact, most people don't use any strategy – they use a few tactics that don't work very well.

So, let me be straight with you: If you've been using flashcards or repetition to try to drill things into your brain, you're making things difficult for yourself.

It's time to work smarter, not harder.

Here's the thing: Your mind is a supercar that you haven't figured out how to drive yet. With practice, you can learn how to memorize *anything* – whether it's a new language, speech, or answers to an upcoming exam.

Oh, and learning how to memorize fast doesn't have to suck, either – it can even be fun. For real. This guide will show you how to memorize fast and easily – the smart way.

Buckle up.

Understand Your Learning Style

Before you try to learn how to memorize fast, it can help to have a basic understanding of how you best interpret and absorb new knowledge.

Now, there are four main learning styles usually referred to by the acronym "VARK":

- Visual
- Auditory
- Reading/writing
- Kinesthetic

Let’s take a closer look at each of them.

1. Visual

Visual learners learn best through sight. They like information to be presented visually and tend to prefer seeing and observing things, such as diagrams, pictures, and demonstrations. Many visual learners also like to sketch, draw, and write lists.

2. Auditory

Auditory learners learn best by listening and when the subject matter is communicated through sound.

They'd rather listen to podcasts, lectures, and audiobooks than read books and notes. If they have to read a book, they're likely to absorb more information if they read it aloud to themselves. Many auditory learners also like to engage in discussions.

3. Reading/Writing

Reading/writing learners prefer to learn through the written word.

They learn best when reading books and articles. They also learn well when taking and reviewing notes. This learning style overlaps with visual learning, however, these learners tend to prefer to express themselves through writing.

Traditional western education systems cater to reading/writing learners by focusing on reading books and writing essays.

4. Kinesthetic

Kinesthetic learners learn best by experiencing or doing things. They're sometimes referred to as "tactile learners."

This type of learner likes to get moving and use their hands. They excel when they can interpret the subject matter through their physical senses. They prefer hands-on exercises over book-learning every day of the week.

Which Style of Learning Do You Prefer?

It may be pretty obvious which learning style you prefer. For example, it's clear to me that I'm a visual and reading/writing learner – after all, I'm a writer.

However, if you're unsure which style – or styles – of learning you prefer, check out this VARK questionnaire to find out.

It’s also worth noting that most people have a natural preference for more than one style. Oh, and in case you were wondering, no particular learning style is better than the others. They're just different!

ACTIVITY --4

Q 1) Elaborate VARK diagrammatically with 3 examples each?

Q2) Identify and list out the names of the items from the given image?

WORKSHEET 5

UNIT II

2.1) Understanding Emotions: Experience & Expression

Emotions are part of our everyday lives. Sometimes, it can feel like our feelings control how we think and act to the point where we feel like we're not in control. Experiencing and expressing emotions are integral parts of life.

Emotions are inherently linked to and influence cognitive skills such as attention, memory, executive function, decision-making, critical thinking, problem-solving and regulation, all of which play a key role in learning.

Kendra Cherry, Psychology Expert, summarized the five main purposes of emotions quite nicely: Emotions help us to take action, to survive, strike and avoid danger, to make decisions, to understand others. Moreover, they help other people to understand

An example of the experience of emotion?

Perhaps you remember being flushed, your heart pounding, feeling sick to your stomach, or having trouble breathing. You were experiencing the physiological part of emotion—arousal—and I'm sure you have had similar feelings in other situations, perhaps when you were in love, angry, embarrassed, frustrated, or very sad.

Do experience and expression of emotion occur together?

According to the Cognitive Appraisal Theory, thinking must occur before experiencing emotion. Thus, a person would first experience a stimulus, think, and then simultaneously experience a physiological response and the emotion.

A widely accepted theory of basic emotions and their expressions, developed Paul Ekman, suggests we have six basic emotions. They include sadness, happiness, fear, anger, surprise and disgust.

Certainly moments in people's lives characterized by experiences of positive emotions—such as joy, interest, contentment, love, and the like—are moments in which they are not plagued by negative emotions—such as anxiety, sadness, anger, and despair.

Emotional expression refers to how one conveys emotional experience through both verbal and nonverbal behaviour. Emotional expression should be distinguished from emotional experience in that it is possible to experience emotions without expressing them.

What is the emotional experience?

Experiences of emotion are content-rich events that emerge at the level of psychological description, but must be causally constituted by neurobiological processes. This chapter

outlines an emerging scientific agenda for understanding what these experiences feel like and how they arise.

An example emotional experience

In some emotional experiences (for example, of anger) we feel active and if not in control then at least aggressive. In other emotional experiences (for example, of sadness) we feel passive and victimized. Thus our feelings include our sense of engagement, of activity or passivity.

Importance of Emotional Experience

Emotions help us to communicate with others, such as when we feel sad and need some help. They also can help us to act quickly in important situations. For example, when you're about to cross the street and see a car coming quickly, fear gets you to jump back onto the curb.29-Dec-2020

2.2)EXPRESSIONS:

Psychologists don't all agree on how to identify our basic emotions, but many agree that there are a minimum of four basic emotions that other emotions stem from; happiness, anger, fear, sadness, and disgust. **Emotions** are typically understood as the experience of feeling that generates both physiological and cognitive responses that impact our behaviour. In other words, emotions result from our feelings that manifest in both mental and physical ways. Our behavioural responses to experiencing emotions are **emotional expressions.**

Emotional expression refers to how one conveys emotional experience through both verbal and nonverbal behaviour. Emotional expression should be distinguished from emotional experience in that it is possible to experience emotions without expressing them.

Emotional Expression in Communication

The way we express our emotions is a huge part of communicating with others. There are two main ways we express our emotions to others: verbal and non-verbal.

a)Verbal

Verbal emotional expression is more or less how it sounds; using words and language to communicate our emotions to others. This is often done in a way to seek help or share our experiences.

b)Non-Verbal

Non-verbal emotional expression is when we communicate our feelings through physical actions and expressions without using language. This is often done through facial expressions, hand gestures, or body language. Sometimes non-verbal emotional expressions can be as subtle as a glance or a slight cough during a conversation to let our friends know we are bored, annoyed, or ready to leave that situation.

c)Importance of Emotional Expression

Emotional expression is a fundamental aspect of communicating with others. There are three main functions of emotions vital to our survival and bring purpose to our lives. When we can share these emotions with others, it can enhance our lives and help us build even stronger relationships. The three primary functions of emotions are:

i)Preparing Us for Action

This function shows how emotions act as a link between what we experience and how we respond to it. For example, if you were lost in the woods and saw a bear, you would feel fear; that fear would drive you to run away or find a way to escape the bear and hide. So the emotions prepared you for the action of running away.

ii)Shaping Our Future Behavior

This function highlights how emotions can help us make smarter choices in the future to avoid what we don't want to feel and achieve what we do want to feel. An example of this is after you escaped the bear and felt the fear, you would likely avoid situations that would put you in a similar position.

iii)Helping Us Interact with Others

This function of emotions is to express to those around us how we are feeling and what we have experienced. Think of the following example - after finally making it home from being in the woods with the bear, you tell your partner about your experiences or show them by running in, screaming or yelling in fear, or even shaking your head and hands to show that you are distressed. This information helps your partner know how to respond to you after having a scary experience. Otherwise, they would not know you are distressed and would act as if nothing happened.

What is emotional expression and example**?**

It can be verbal or nonverbal, and can occur with or without self-awareness. Emotional expressions include facial movements like smiling or scowling, simple behaviors like crying,

laughing, or saying "thank you," and more complex behaviors like writing a letter or giving a gift.

What is meant by emotional expression?

Emotional expression is simply the acknowledgement of these emotions we are built to feel. Healthy expression allows us to understand the emotions, truly feel them and move on. There are six basic emotions humans are born with that we should all be able to recognize: Anger. Sadness.

Certainly, moments in people's lives characterized by experiences of positive emotions—such as joy, interest, contentment, love, and the like—are moments in which they are not plagued by negative emotions—such as anxiety, sadness, anger, and despair.

The 7 emotional expressions are as follows:-

Facial expressions that give clues to a person's mood, including happiness, surprise, contempt, sadness, fear, disgust, and anger.

The difference between emotion and expression is :-

A facial expression is the shape that your face takes, like a smile.

An emotion is a feeling in your body, like stress. Sometimes facial expressions can reflect emotions

Emotional expression is important for students as Emotions play a role in how and why studentslearn.

Benefits of Expressing Emotions

As we mentioned earlier, the expression of emotions can help us in practical ways, like helping us share our experiences with others and get help. Emotional expression can also benefit our mental and physical health.

Mental Health Benefits

Expressing our emotions can help our mental health by allowing us to make sense of our own emotions. Sometimes our emotional responses don't make sense to us, or they can feel out of our control. Maybe you don't want to be feeling jealous or upset; expressing how you feel to others, or even yourself, can help you understand what is making you feel the unwanted emotions, and then you can use that knowledge to avoid them in the future.

Physical Health Benefits

Expressing emotions also brings physical health benefits. Emotions are signaled in our body through the **limbic system.** The limbic system is the part of the brain responsible for emotions and emotion regulation. The **amygdala** is an almond-shaped inner part of the brain that is part of the limbic system responsible for emotional perception and response. The amygdala also helps us form memories. It makes sense why memory and emotions seem to work closely together.

The limbic system uses brain chemicals to feel emotions, which means that an increase in stressful emotions also means an increase in stress hormones released in the body. Emotional expression is one of the ways you can help reduce the amount of these hormones in the body, helping you feel better physically and emotionally. The effect of stress hormones and the connection between our emotional selves and our physical health is studied further in what is called **health psychology**.

ACTIVITY 5: Quiz

GROUP A

Q1) Our behavioural responses to experiencing emotions are _____ _____.

Q 2)An example of emotional expression is --------

Q 3)True or False: Non-Verbal emotional expression is when we communicate our feelings without language, through physical actions and expressions.

Q 4)True or False, Men are better at picking up on emotional cues.

Q5)An example of non-verbal emotional expression that can cross cultures is

Q 6)The ____ ____ ____ is how not only do our emotions trigger a facial response, but our facial expressions can also trigger us to feel certain emotions.

Q 7)True or False: There are four main functions of emotions

Q 8)Choose the three main functions of emotions ----------

Q 9)The _____ _____ is the part of the brain responsible for emotions and emotion regulation

Q 10)True or False: The limbic system is apart of the amygdala.

GROUP B

Q 11)The effect of stress hormones and the connection of our emotional selves and our physical health is studied further in what is called _____ _____.

Q 12)What is an example of non-verbal emotional expression that is not the same across cultures?

Q13)What is an example of emotions preparing us for action?

Q14)Who laid the framework for the widely shared belief that humans possess basic emotions.

Q 15)_____ are the basic emotions experienced by humans including anger, fear, disgust, sadness, happiness, and surprise

Q16)What are secondary emotions?

Q 17)True or False? Primary emotions do not come naturally but are learned either through familial or social influences.

Q 18)True or False? Cognitive processing is required for secondary emotions whereas primary emotions require no second thought.

Q 19)While ____ often has negative connotations, it is key to our survival as a species and it's what triggers our fight or flight response.

Q 20)_____ is an emotional state in which a person feels mistreated or hindered from pursuing a goal.

GROUP C

Q21)_____ often arises from repulsive or aversive feelings towards something.

Q 22)_____ is an emotion that is characterized by hopelessness, disappointment, or grief that may be triggered by the loss of a valued person or object.

Q 23)A pleasant emotional state characterized by feelings of enjoyment, satisfaction, and contentment that is the most desirable of the six primary emotions is _____

Q 24)True or False? Surprise is *always* a brief emotion.

Q25)Feelings of neglect or loneliness may be extensions of what primary emotion?

Q 26)Feeling purplexed or astonished is an extension of which primary emotion?

Q 27)How did Carroll Izard identify his 10 primary emotions?

Q 28)While watching a movie in class, you notice that your friend Jackson's eyebrows are pulled together, his eyes are drooping, and the corner of his lips are slightly angled downward. What primary emotion might Jackson be experiencing?

Q 29)True or False: Emotions result from our feelings that manifest in both mental and physical ways.

Q 30)What is the number of ways we express our emotions to others?

GROUP D

31) How many primary emotions are there?

32)True or False: Primary emotions happen automatically.

33) Who identified that humans have 6 primary/basic emotions?

34) Which of the following is NOT one of the 6 primary emotions? Select all that apply.

35)From the following choices, select those that are considered a primary emotion.

36)During a class discussion, you observe that your friend Alice has her eyebrows pulled up together and that the corners of her lips are downward.

Which primary emotion is she most likely showing?

37)Fill in the blank: _____ plays an important role in highlighting moments in which we need comfort or support.

38)Fill in the blank: _____ is an emotional state that follows an encounter with sudden or unexpected stimuli.

39)Which motion is meant to help us identify what's happening, and whether or not we are in danger?

40)True or False: Primary emotions are reactions either to a threat or an opportunity

GROUP E

41)Which primary emotion may signal friendliness to others, as well as communicate that we are not a threat?

42)Before which age range do children often experience *distaste* rather than disgust?

43)Emotional expression is defined as _____.

44)Shouting, "I'm angry!" is an example of which kind of emotional expression?

45)Sitting slumped over in your chair is an example of which kind of emotional expression?

46)Smiling until you start to feel happy is an example of _____.

47)Seeing a snake and running away in fear is an example of which function of emotion?

48)Brian didn't study and did poorly on his test. He feels regret and sadness about the grade he received. Brain never wants to feel like this again, so he vows to study from now on. This is an example of which function of emotion?

49)Michelle had a bad day and went home to tell her boyfriend all about it. This shows her boyfriend that Michelle feels better when she talks through her emotions. This is an example of which function of emotion?

50)In addition to helping us process emotions, our amygdala also helps to do what?

WORKSHEET 6

2.2) EMPATHY

The real meaning of empathy?

So, what is empathy? It's the ability to understand another person's thoughts and feelings in a situation from their point of view, rather than your own. It differs from sympathy, where one is moved by the thoughts and feelings of another but maintains an emotional distance.24-Jun-2020

The three types of empathy that psychologists have defined are: **Cognitive, Emotional, and Compassionate**.

Signs of Empathy

For many, seeing another person in pain and responding with indifference or even outright hostility seems utterly incomprehensible. But the fact that some people do respond in such a way clearly demonstrates that empathy is not necessarily a universal response to the suffering of others.

If you are wondering whether you are an empathetic person, here are some signs that show that you have this tendency:

You are good at really listening to what others have to say.

People often tell you about their problems.

You are good at picking up on how other people are feeling.

You often think about how other people feel.

Other people come to you for advice.

You often feel overwhelmed by tragic events.

You try to help others who are suffering.

You are good at telling when people aren't being honest.

You care deeply about other people.

You find it difficult to set boundaries in your relationship

Empathy is the ability to emotionally understand what other people feel, see things from their point of view, and imagine yourself in their place. Essentially, it is putting yourself in someone else's position and feeling what they are feeling.

Empathy means that when you see another person suffering, such as after they've lost a loved one, you are able to instantly envision yourself going through that same experience and feel what they are going through.

5 Top Empathy Examples

Sensing Someone's Emotions. ...

Imagining yourself in Someone's Situation. ...

Feeling Sadness for Someone Else's Sadness. ...

Feeling Happiness for Someone Else's Happiness. ...

Feeling Strongly for People who Share your Identity.

2.3)What is peer empathy?

Empathy is the ability to sense and share the emotions of another person, and to imagine what they are going through. Empathy is not the same as sympathy, which is feeling sorry or pity for someone. Empathy is more about connecting and relating to your peer, and recognizing their strengths and resilience.

Empathy is a vital skill for peer support, and peer feedback is a valuable tool for improving it. By giving and receiving peer feedback, you can enhance your ability to understand and share the feelings of others, and become a more effective and supportive peer.

How can you show empathy with your peers?

Here are seven steps that can help you show empathy in the workplace:

Approach challenges from a different perspective. ...

Ask questions to understand. ...

Validate how the other person is feeling. ...

Determine the preferred resolution. ...

Develop your listening skills. ...

Offer to help. ...

Challenge your biases.

ACTIVITY 6

Q1.Watch this TEDTALK and write the gist of the topic.

https://youtu.be/kcW4ABcY3zI?si=rFnm5mBkuGp6YAYk

Q2.Watch this TEDTALK and write the gist of the topic.

https://youtu.be/PGUdWfB8nLg?si=v_PzNo91t_R_3byc

WORKSHEET 7

UNIT II-

b) Being Ingenius &Fixing Problems:-

2.4)Understanding Creative thinking process,

Creative thinking includes the process of innovative problem-solving — from analyzing the facts to brainstorming to working with others. Creative thinking examples include analytical skills, innovation, and collaboration.

What is the process of creativity thinking?

From songwriters to television producers, creative individuals generally go through five steps to bring their ideas to fruition—preparation, incubation, illumination, evaluation, and verification.

Creative thinking involves four stages:

1. Preparation:

In this stage the thinker formulates the problem and collects the facts and materials considered necessary for finding new solutions. Many times the problem cannot be solved even after days, weeks or months of concentrated efforts. Failing to solve the problem, the thinker turns away from it initiating next stage.

2. Incubation:

During this period some of the ideas that were interfering with the solution will tend to fade. The overt activity and sometimes even thinking about the problem is absent in this stage. But the unconscious thought process involved in creative thinking is at work during this period. Apparently the thinker will be busy in other activities like reading literature or playing games, etc. Inspite of these activities the contemplation about finding a solution to problem will be going on in the mind.

3. Illumination:

Following the period of incubation the creative ideas occur suddenly. Consequently the obscure thing becomes clear. This sudden flash of solution is known as illumination and is similar to 'aha (eureka)' experience. For example, Archimedes found solution to the crown problem.

4. Verification:

Though the solution is found in illumination stage, it is necessary to verify whether that solution is correct or not. Hence in this last stage evaluation of the solution is done. If the solution is not satisfactory the thinker will go back to creative process from the beginning.

If it is satisfactory, the same will be accepted and if necessary, minor modification may also be made in solution

Problem solving is the art of identifying problems and implementing the best possible solutions. Revisiting your problem-solving skills may be the missing piece to leveraging the performance of your business, achieving Lean success, or unlocking your professional potential.13-Mar-2023

2.5) Understanding problem solving: Employers like to see good problem solving skills because it also helps to show them you have a range of other competencies such as logic, creativity, resilience, imagination, lateral thinking and determination. It is a vital skills for your professional and personal life.

This Creative Problem-solving Test was developed to evaluate whether your attitude towards problem-solving and the manner in which you approach a problem are conducive to creative thinking. This test is made up of two types of questions: scenarios and self-assessment.

7 steps of the creative problem solving process

Identify the goal. Before solving the problem, you need to fully understand the problem you're trying to solve. ...

Gather data. ...

Formulate challenge questions. ...

Explore ideas. ...

Come up with solutions. ...

Create an action plan. ...

Take action.

Solving current problems by considering what would have happened if the past had been slightly different. For example, considering a current career choice by thinking about your choices up to this point and the universe of paths not taken.

2.6) The 3 components of creative problem solving:-

The most recent model of Creative Problem Solving divides the creative problem solving process into three general areas: Exploring the Challenge, Generating Ideas, and Preparing for Action.

How to improve your creative problem-solving skills

Use a strategic framework. Creative problem-solving is a framework within itself. ...

Practice empathy. ...

Get a hobby. ...

Relax your assumptions. ...

Practice persistence. ...

Question standard practices. ...

Consider your past experiences. ...

Become an expert in your field.

ACTIVITY 7:

1.Draw a painting using Watercolors on the topic "Save Earth "

2.Make use of pulses /or any household items to make a replica of any bird /fruits/scenery.

WORKSHEET -8

Unit III -Basics of Design Thinking

3.1) Definition of Design Thinking:-Design thinking is a non-linear, iterative process that teams use to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. Involving five phases—Empathize, Define, Ideate, Prototype and Test—it is most useful to tackle problems that are ill-defined or unknown.

Design thinking is an extension of innovation that allows you to design solutions for end users with a single problem statement in mind. It not only imparts valuable skills but can help advance your career. It's also a collaborative endeavor that can only be mastered through practice with peers

3.2)NEED OF DESIGN THINKING

Design thinking in the classroom has exploded in the last few years! This unique creative problem-solving mindset and approach can be used to improve the educational experiences of students and teach them how to think about the world in new and different ways than they are used to.

3.3)OBJECTIVE OF DESIGN THINKING

Design thinking is a process for solving problems by prioritizing the consumer's needs above all else. It relies on observing, with empathy, how people interact with their environments, and employs an iterative, hands-on approach to creating innovative solutions.

Design Thinking approaches problems from a human perspective, with the objective of designing innovative and desirable products, services or experiences that reflect all three aspects.

3.4)Concepts & brainstorming

Brainstorming is a group problem-solving method that involves the spontaneous contribution of creative ideas and solutions. This technique requires intensive, freewheeling discussion in which every member of the group is encouraged to think aloud and suggest as many ideas as possible based on their diverse knowledge.

what is concept of mapping and brainstorming?

Concept mapping is a brainstorming technique that lets you visualize concepts and ideas. Also known as “mind mapping”, this technique starts with a research question or main idea, then adds branches with synonyms, related topic, keywords, and examples. The following image is an example of brain storming.

What is the example of brainstorming?

The mind map is a perfect example of brainstorming. You can solve complex problems based on the central idea and define its related themes with a mind map. A mind map is a helpful tool for teachers because they use it to improve the information gathering and writing skills of their student.

Design thinking is a non-linear, iterative process that can have anywhere from three to seven phases, depending on whom you talk to. We focus on the five-stage design thinking model proposed by the Hasso Plattner Institute of Design at Stanford (the d.school) because they are world-renowned for the way they teach and apply design thinking.

3.5) The 5 Stages of the Design Thinking Process

Empathize: research your users' needs.

Define: state your users' needs and problems.

Ideate: challenge assumptions and create ideas.

Prototype: start to create solutions.

Test: try your solutions out

Stage1: Empathize-Research Your User Need

Empathize: the first phase of design thinking, where you gain real insight into users and their needs.

The first stage of the design thinking process focuses on user-centric research**.** You want to gain an empathic understanding of the problem you are trying to solve. Consult experts to find out more about the area of concern and conduct observations to engage and empathize with your users. You may also want to immerse yourself in your users' physical environment to gain a deeper, personal understanding of the issues involved—as well as their experiences and motivations. Empathy is crucial to problem solving and a human-centered design process as it allows design thinkers to set aside their own assumptions about the world and gain real insight into users and their needs.

Depending on time constraints, you will gather a substantial amount of information to use during the next stage. The main aim of the Empathize stage is to develop the best possible understanding of your users, their needs and the problems that underlie the development of the product or service you want to create.

Stage 2: Define—State Your Users' Needs and Problems

Define: the second phase of design thinking, where you define the problem statement in a human-centered manner.

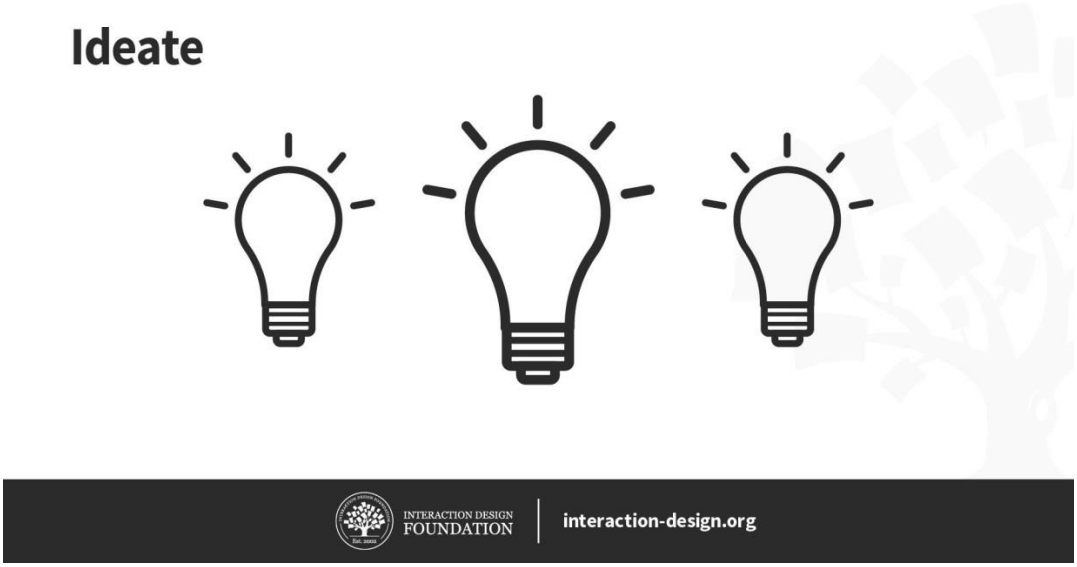
In the Define stage, you will organize the information you have gathered during the Empathize stage. You'll analyze your observations to define the core problems you and your team have identified up to this point. Defining the problem **and problem statement must be done in a human-centered manner**.

For example, you should not define the problem as your own wish or need of the company: "We need to increase our food-product market share among young teenage girls by 5%."

You should pitch the problem statement from your perception of the users' needs: "Teenage girls need to eat nutritious food in order to thrive, be healthy and grow."

The Define stage will help the design team collect great ideas to establish features, functions and other elements to solve the problem at hand—or, at the very least, allow real users to resolve issues themselves with minimal difficulty. In this stage, you will start to progress to the third stage, the ideation phase, where you ask questions to help you look for solutions: "How might we encourage teenage girls to perform an action that benefits them and also involves your company's food-related product or service?" for instance.

Stage 3: Ideate—Challenge Assumptions and Create Ideas

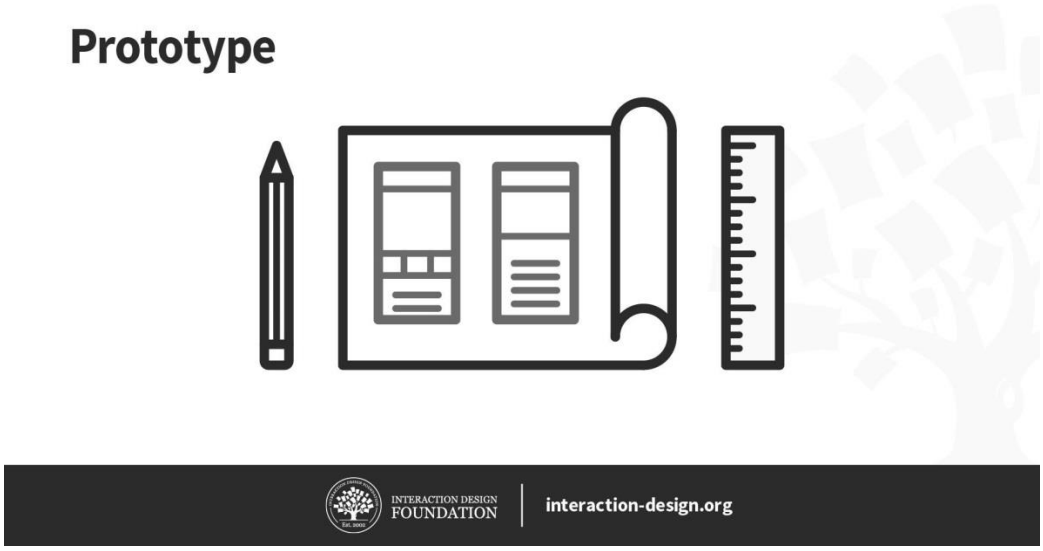


Ideate: the third phase of design thinking, where you identify innovative solutions to the problem statement you've created.

During the third stage of the design thinking process, designers are ready to generate ideas. You've grown to understand your users and their needs in the Empathize stage, and you've analyzed your observations in the Define stage to create a user centric problem statement. With this solid background, you and your team members can start to look at the problem from different perspectives and ideate innovative solutions to your problem statement.

There are hundreds of ideation techniques you can use—such as Brainstorm, Brainwrite, Worst Possible Idea and SCAMPER. Brainstorm and Worst Possible Idea techniques are typically used at the start of the ideation stage to stimulate free thinking and expand the problem space. This allows you to generate as many ideas as possible at the start of ideation. You should pick other ideation techniques towards the end of this stage to help you investigate and test your ideas, and choose the best ones to move forward with—either because they seem to solve the problem or provide the elements required to circumvent it.

Stage 4: Prototype—Start to Create Solutions



Prototype: the fourth phase of design thinking, where you identify the best possible solution. The design team will now produce a number of inexpensive, scaled down versions of the product (or specific features found within the product) to investigate the key solutions generated in the ideation phase. These prototypes can be shared and tested within the team itself, in other departments or on a small group of people outside the design team.

This is an experimental phase, and the aim is to identify the best possible solution for each of the problems identified during the first three stages**.** The solutions are implemented within the prototypes and, one by one, they are investigated and then accepted, improved or rejected based on the users' experiences.

By the end of the Prototype stage, the design team will have a better idea of the product's limitations and the problems it faces. They'll also have a clearer view of how real users would behave, think and feel when they interact with the end product.

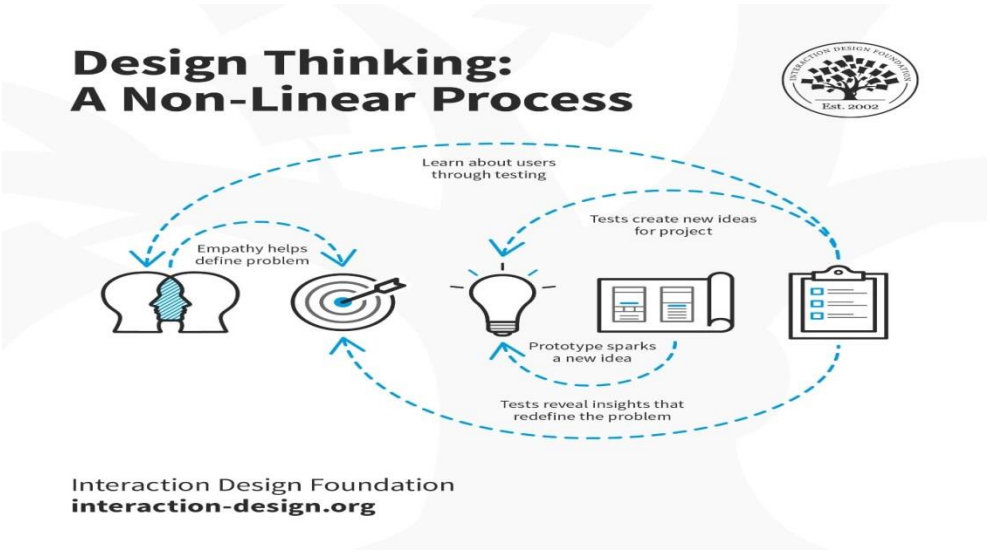
Stage 5: Test—Try Your Solutions Out

Test: the fifth and final phase of the design thinking process, where you test solutions to derive a deep understanding of the product and its users.

Designers or evaluators rigorously test the complete product using the best solutions identified in the Prototype stage. This is the final stage of the five-stage model; however, in an iterative process such as design thinking, the results generated are often used to redefine one or more further problems. This increased level of understanding may help you investigate the conditions of use and how people think, behave and feel towards the product, and even lead you to loop back to a previous stage in the design thinking process. You can then proceed with further iterations and make alterations and refinements to rule out alternative solutions. The ultimate goal is to get as deep an understanding of the product and its users as possible.

Design Thinking is a Non-Linear Process?

We've outlined a direct and linear design thinking process here, in which one stage seemingly leads to the next with a logical conclusion at user testing. However, in practice, the process is carried out in a more flexible and non-linear fashion**.** For example, different groups within the design team may conduct more than one stage concurrently, or designers may collect information and prototype throughout each stage of the project to bring their ideas to life and visualize the problem solutions as they go. What's more, results from the Test stage may reveal new insights about users which lead to another brainstorming session (Ideate) or the development of new prototypes (Prototype).



It is important to note the five stages of design thinking are not always sequential. They do not have to follow a specific order, and they can often occur in parallel or be repeated iteratively. The stages should be understood as different modes which contribute to the entire design project, rather than sequential steps.

The design thinking process should not be seen as a concrete and inflexible approach to design; the component stages identified should serve as a guide to the activities you carry out. The stages might be switched, conducted concurrently or repeated several times to gain the most informative insights about your users, expand the solution space and hone in on innovative solutions.

This is one of the main benefits of the five-stage model**.** Knowledge acquired in the latter stages of the process can inform repeats of earlier stages**.** Information is continually used to inform the understanding of the problem and solution spaces, and to redefine the problem itself. This creates a perpetual loop, in which the designers continue to gain new insights, develop new ways to view the product (or service) and its possible uses and develop a far more profound understanding of their real users and the problems they face.

Activity 8: Design Thinking:-

1. **Building a new rollercoaster**

2. **Crafting a book cover,**

3.Creating an app to solve a real-world problem or a web page.

4.Designing a website to explain a process or product,

5.UberEATS: How useful is it to society

6.Apple -Product usage in the world

WORKSHEET 9

UNIT 4

4.1)Process Of Product Design

The Engineering Design Process includes six steps. For each step, click the button for an example of how engineers might go about designing a new car.

Step 1: State the Problem. ...

Step 2: Generate Ideas. ...

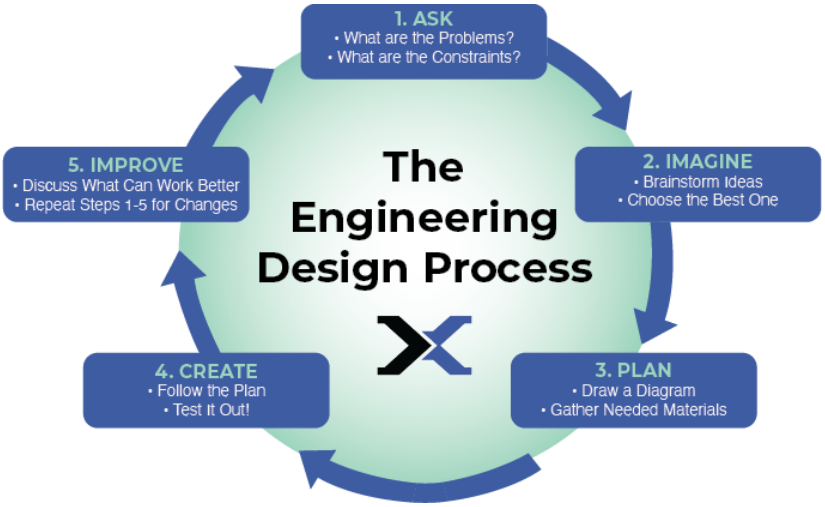
Step 3: Plan and Select a Solution. ...

Step 4: Build the Item. ...

Step 5: Evaluate. ...

Step 6: Present the Results.

What Is The Engineering Design Process?



The engineering design process is an important series of steps that engineers and designers follow to create products, solutions, and processes. The process is used in all of the work that Tresca Design does and we will utilize it while working on your project.

The steps of the process are predetermined, however, steps are often repeated or revisited depending on the project. This allows for lessons to be learned from failures and improvements to be made.

4.2)Design Thinking Approach: The design process applies the principles of engineering and allows for certain requirements to be met before moving on to the next step. This assures confidence in the final product since the design went through rigorous testing at each step.

1. Ask & Define

Who, what, when, where, why? Engineers will ask a lot of questions to get a better understanding of the problem and desired solution. This way you get the product you need to solve your problem!

Key Points of This Phase:

Who is the problem being solved for?

What is the problem that needs to be solved?

When does the solution need to be completed?

Where does the problem occur?

Why is it important to find a solution?

What are the limitations and requirements for the solution?

2. Imagine

Great design starts with brainstorming possible solutions to the problem. Engineers will try to think of as many possibilities before deciding to move forward in a specific direction.

Key Points of This Phase:

Generate possible solutions

Avoid judgement and critiques

Let the ideas flow

3. Research & Plan

Now that you have a list of possible solutions, it is time to reduce the possibilities by beginning to judge the ideas by the requirements, constraints, and outside research is done. While researching, engineers will often learn why certain ideas won't be feasible and the list of many ideas will be brought down to a few great ideas!

Then the engineer will decide on a direction to move forward by considering factors such as manufacturability, can the project fit within the time and budget constraints, and which design is best to meet the customer requirements. A plan will be made to build a prototype and test it according to the requirements.

Key Points of This Phase:

Conduct research about the problem and possible solutions

Reduce the number of possible solutions by applying requirements and constraints

Select a design to move forward with and plan for this project

4. Create & Test

After a direction for the design has been chosen in the research and planning phase, the engineer must now create a model or prototype to then test to see where improvements are needed.

Key Points of This Phase:

Create model or prototype of design

Test model according to requirements and user experience

Understand where improvements are needed

5. Improve & Refine

Once initial testing is complete, the engineer will have data that shows where improvements are necessary. After making changes to the model or prototype, the tests will be completed again to see if the changes in design improved performance. This is an iterative process where multiple revisions are often necessary to obtain the desired results.

Key Points of This Phase:

Analyze test results and make plans for design improvements

Implement design improvements

Re-evaluate the design to measure if changes to design improved performance

6. Communicate Design & Consider Next Steps

Finally, now that the engineer is satisfied with the performance of the model or prototype, a final decision is made on the design's completion of all requirements within the given constraints. Then if desired by the customer, the next steps are decided on how to move forward with manufacturing the product for larger audiences. This can include a plan to set up larger manufacturing and a purchasing plan to find suppliers for all the parts required to build the design. This can seem like an intimidating process but we are prepared to work with you through every step.

Working with a company like Tresca Design will aid you in the entire process, from start to finish. Your success is our success, from plan to product. Contact us today to see where we can help you in your engineering process.

What type of approach does design thinking follow?

Design Thinking fosters an outside-the-box approach, with a huge emphasis on creativity, innovation, and the needs of the user. The Design Thinking process is used to apply the Design Thinking ideology to real-world, wicked problems. It offers a solution-based approach to problem-solving.

4.3)Product Design

There are 7 steps to an effective product design process, let's start with the product vision.

Defining the product vision. Your product vision is the starting point of the entire product design process. ...

Product research. ...

User and market analysis. ...

Ideation Stage. ...

Design. ...

Testing and validation. ...

Post-launch.

Product Design Process (PDP)(STAGES)

A product design process is the sequence of steps or activities a business employs to formulate, design, and manufacture a product. Typically, they are part of an overall New Product Development (NPD), where the companies create new products via efficient idea generation, concept development to manufacture and commercialisation.

What is a Product Design Process?

A Product Design Process (PDP) is a set of planned activities that convert an idea into a product and make it commercially available to the end user.

In today's world, modern technologies are a very complex social enterprise. Hence the product design process includes research and development, design, management, marketing, finance, manufacturing, production and maintenance.

Because of this complexity, an individual can't manage this engineering product designs single-handedly. Due to this extent of multiple stakeholder involvement, it's vital to have planned processes and effective communication across the stakeholders.

Hence, to increase the probability of a successful engineering product design, the planning and execution of a systematic design process are crucial.

Types of Product design processes

The design process may vary according to the products, such as whether they are tangible or intangible. For example, physical products such as smart watches, mobile phones and earphones are examples of tangible products where the product design process involves detailed design and manufacture. On the other hand, intangible products such as services, mobile phone applications, and computer software will have Implementation, testing, verification & Deployment instead of Detailed design and manufacture.

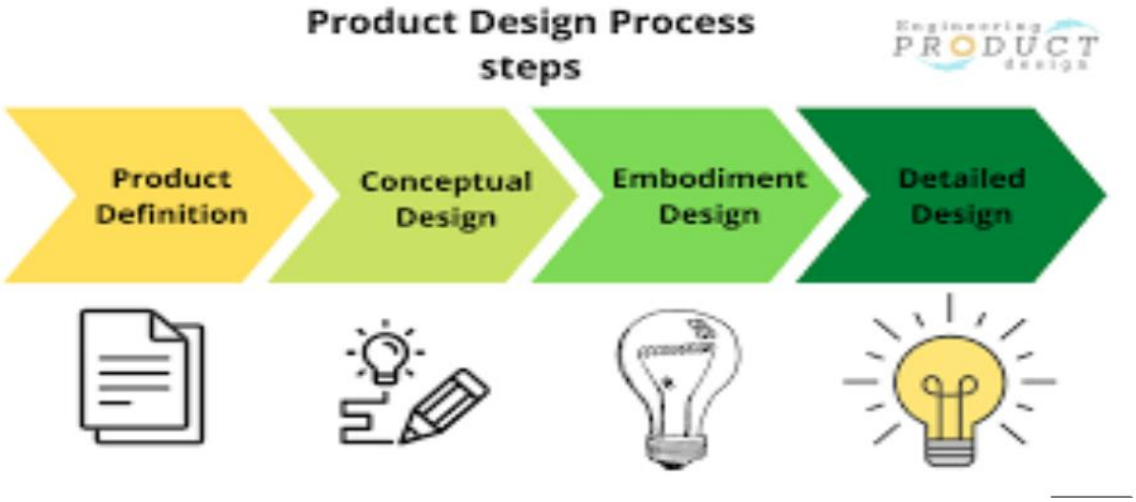
Product design processes also change depending on how the engineering product innovation is driven, whether **Demand-pull innovation (Market-pull)** or **Invention-push (Technology-push)** innovation. This article concentrates on the tangible engineering product design process.

Product design process steps

Without a product design process plan, product designers would have an overwhelming number of options, given the process's complexity and the numerous available methods. Designers

must therefore become knowledgeable about the design process, various techniques, and the working and decision-making steps suggested in procedural plans.

In his book French. M.J. groups the product design process into the following four main phases: **Problem analysis**, **Conceptual design**, and **embodiment of schemes** and **detailing**. According to Koberg and Bagnell, the product design process typically involves **Product analysis**, **Concept stage** and **Product Synthesis.**



According to Pahl and Beitz, the design process needs to be broken down into phases and small steps, each with its procedures, to have a successful new product design. With this in mind, they split the process into four phases.

Product Definition – Product planning

Conceptual design

Embodiment design

Product Definition – Product planning

As the name implies, product definition defines the product in detail so the actual design can begin, and any subsequent steps rely on these requirement definitions. Depending on the nature of the product design, this is sometimes knowns as a **"**Problem definition**"** or **"**Product Planning**"** or **"**Task clarification**".**

This step is distinct from the fuzzy front end, where product planning happens at the top level, such as marketing or the business.

Typically the product design and development task is given to the engineers and designers by either the marketing department or a client. Even if the requirement is captured in a document, the design team must clarify the requirement and start a Product Design Specification (PDS)**.**

As a result of this activity, a comprehensive PDS in the form of a requirements list emphasising all technical, economic, and quality factors is produced.

Conceptual design

Concept design, also known as conceptual design, is an early stage of the design process in an engineering setting and results in the specification of a principle solution or so-called "Concept".

There are several steps in the conceptual design phase, and if the most effective general solution is to be found, then the Designer should include all of them.

Define the problem and refine the PDS

Investigate the existing solutions

Generate ideas and concepts

Evaluate concepts

Finalise concepts

Embodiment design

This is the stage of the design process where the design of a technical product is developed from the basic idea or concept per technical and economic standards up to the point where further detailed design can result in immediate production.

Three key stages of Embodiment design

Product architecture

Design configurations

Parametric design

Detail design

During this stage of the design process, all of the individual parts' arrangements, shapes, dimensions, and surface characteristics are finalised. Additionally, the materials are specified, production possibilities are evaluated, costs are estimated, and all drawings and other production documents are created. The detailed design phase results in a detailed final specification of every part and assembly in the form of production documentation such as part drawing, assembly drawing, bill of material and production procedure.

You can provide feedback and recognition individually or collectively, verbally or in writing, during or after the discussion. Feedback and recognition can help your team members to improve their skills, boost their confidence, and motivate them to participate more actively in future discussions.29Design thinking is a methodology which provides a solution-based approach to solving problems. It's extremely useful when used to tackle complex problems that are ill-defined or unknown—because it serves to understand the human needs involved,

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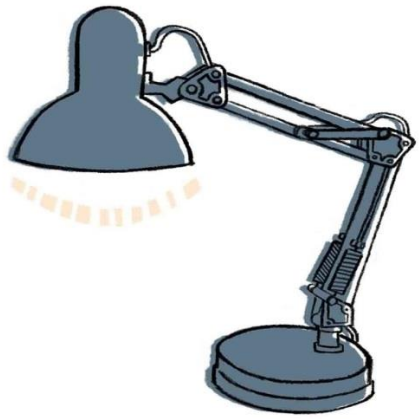
4.4)EXAMPLES OF BEST PRODUCT DESIGNS



1.AnglepoiseLamp

Thanks to the creation of a new type of spring in 1932, the angelpoise lamp design first name onto the scene, created by engineer George Carwardine. It's revered for it's ability to be moved and hold position in any direction.

2. Automatic Transmission

One of the most important, yet least appreciated designs. The design of the automatic transmission revolutionized fuel economy and established the foundation from which future automatic transmissions would be designed and built.

3. Ball Point Pen

When faced in 1938 with fountain pens that would bleed ink or dry out, László Jozsef Bíró invented the ballpoint pen. With thicker ink and the tiny ball bearing controlling the flow, the ballpoint pen became one of the most innovative and most purchased products in history.

4. Bendy Straw: Humans have used drinking straws in some form or another for hundreds of years. The bendy straw was patented in 1937, after Joseph B. Friedman noticed his young daughter trying to drink out of a tall glass through a straight straw.

5. Fitbit

One of the newer items on this list, the Fitbit, revolutionized the industry of wearable health tech. With a sleek design that fits comfortably and functionally around the wrist, it acts as a pedometer, altimeter, and sleep tracker all in one.

6. Fender Stratocaster Electric Guitar

Now one of the most recognized shapes in the musical world, the Stratocaster, has been adored for decades by guitarists worldwide. Launched in 1954 by Leo Gender, it features a highly contoured body shape, an innovative tremolo system, and two-tone sunburst finish.

7. Hula Hoop

The modern hula hoop was born in the 1950s. It was one of the simplest, yet most popular toy designs ever. During the height of the fad in 1958, over 100 million hoops were sold.

8. Coca Cola Bottle

Now considered one of the most popular and well-known shapes in the world, the Coca-Cola curvy glass bottle was invented in 1915. In an effort to design a "bottle so distinct that you would recognize it by feel in the dark or lying broken on the ground."

9. Mascara Wand

The modern mascara wand was invented in 1958 by Revlon. Before this, mascara was applied with small brushes. The modern wand allows for easy application, lifting, and separating strands to achieve the best look.

10. Oreo Cookie

The Oreo has been the number 1 best-selling cookie in America since 1912. The Oreo is an innovation, by simply sandwiching creme filling between two chocolate cookies. The design has been replicated often in the past 100 years, but the Oreo is a classic.

11. Polaroid Camera

Polaroid recently celebrated 75 years of history. First presented in 1947, the Polaroid was the first instant camera in the world. It's shoot, pull, and shake design is known around the world.

12. PEZ Dispenser

PEZ candies are much older, but the dispenser we know today was designed in 1948. The ability to offer out one piece of candy at a time was revolutionary and familiar to everyone who grew up in the USA starting in 1952.

13. IPhone

Since 2007, we've kept iPhones in our pockets and the design has grown and evolved over time. The iphone, has kept the signature clean, minimal, and glossy feel that Apple imbues into all its' products.

14. Post-it Notes

This design came into being by accident! While trying to create a high strength adhesive for planes in 1968, Spencer Silver accidentally created an adhesive that was pressure sensitive and perfect to peel away without leaving residue.

15. Tupperware

One of the most overlooked yet common items in your home, the Tupperware container, was revolutionary for housewives in the 1950s. The airtight seal was one of the most intelligent American designs.

16. VW Beetles

Between 1945, Volkswagen sold 40 million models of these unique vehicles. It's not accredited to be the most-produced car in history.

17. Wurlitzer Jukebox

Wurlitzer introduced it's classic jukebox in 1946. It was an immediate classic and even though jukeboxes in general have fallen out of fashion, the design is still an immediately recognizable icon of 1950's America.

18. Zippo Lighter

The best product designs are unmistakable and evoke a specific mood, when seen and used. Wrapping up this list is the zippo lighter, designed to combat awkward, wind-susceptible lighters, and matches. The Zippo has always been the definition of cool

What is assignment format?

The assignment should be presented as a technical report. It must consist of a cover sheet, content page, and should have an introduction, a body, a conclusion or recommendation, and a reference page.

What are the 10 steps of product design?

Ten Steps of the Product Design Process

Brainstorming. The first step to design a product is brainstorming, which appeared in 1953 in the United States. ...

Defining the Product. ...

Conducting the User Research. ...

Sketching. ...

Prototyping. ...

Compiling Specifications. ...

Producing the Factory Samples. ...

Sample Testing.

ACTIVITY-9

1.Design a physical product/model

2.Invitation cards

3.Make playthings from household items

4.Make a chart of" Audio- instruments"--From gramophone, cassette, Walkman, ipods, cell phones, Dolby stereo music system. Paste pictures or draw on a chart.

WORKSHEET 10

UNIT V

5.1)a) Prototyping and Testing

Prototyping is the fourth phase of design thinking. Prototyping helps to understand the user through the implementation of experimental ideas and designs. Prototyping is considered a vital process in design thinking. It is the experimental stage in which design teams look to implement test designs on users before reaching the final testing stage.

This step deals with building the ideas and checking for their feasibility to arrive at the final solution. This is the step in which three things are mainly taken care of.

Creation of experience

Getting feedback

Iteration

The step of prototyping is the one in which the end user comes into picture. The end user is actively involved in this component of design thinking. All the feedback is taken from the customer, and based on the criticisms, suggestions, and appreciations received, the design thinkers create a better solution after iterating the process of design thinking's first three steps, viz. Empathize, Define, and Ideate.

Prototyping requires thinkers to create tangible products, which can be small-scale models of the exact solution.

5.2) prototype is a product built to test ideas and changes until it resembles the final product. You can mock-up every feature and interaction in your prototype as in your fully developed product.

Thus, prototyping allows designers to test the practicability of the current design and potentially investigate how trial users think and feel about the product. It enables proper testing and exploring design concepts before too many resources get used.

The rapid prototype development process utilizes tools to simplify the process of generating new product ideas by allowing frequent creation of new products.

5.3)What are the three phases of rapid prototyping?

Three Phases This ID Model is marked by three developmental phases: Front-End Analysis, Rapid Prototyping (design and development), and Project Deployment. The three phases are described in more depth below. All three phases are related to a Rapid Prototyping environment.

The rapid prototyping process includes three steps: prototyping, testing, and refining. Designers go through these stages in order, improving their solutions based on the prototype testing results and the feedback they received from users.03-Sept-2020

5.4)What products are made from rapid prototyping?

Application areas. Rapid prototyping is also commonly applied in software engineering to try out new business models and application architectures such as Aerospace, Automotive, Financial Services, Product development, and Healthcare.

Rapidly Prototyping Dentures Some are already doing amazing things by 3D printing sample sets of dentures, for example, to ensure that the fit is correct for patients. CAD software can enable them to make changes instantly and test the updated dentures before manufacturing the final product.

What are 2 examples of a prototype?

Some of the examples of prototypes are wireframes, slides, landing pages, working models, an interactive frontend, and videos. How do I create a startup prototype? The way to create a startup prototype depends on the prototyping method you choose. For example, to create a wireframe, you only need a pen and pencil.

Scaling.

Form and Fit.

Flow Analysis.

Stress Analysis.

Mock-Up Parts.

Pre-Production Parts.

Diagnostic and Surgical Operating Planning.

Design and Fabrication of Custom Prosthesis and Implant.

5.5)What is a marketing test group?

Marketers use test groups to study how users interact with their campaigns, and control groups too have an important role to play. Read on to find out more about how these groups differ and learn how they can be used to ensure the accuracy of test results.

Group of people who try a product or service to see how well it works, and whether they like it or would buy or use it: We always play the scripts for our ads to test groups of viewers before we finalize them.

In marketing, the 'Test' group refers to the target audience (users) that receives email or phone call campaigns as part of a new advertising strategy or promotional offer. Whereas, the 'Control' group refers to users who are not part of the campaign or promotional offer.

Test marketing of retail products involves placement of limited-quantity items or free samples to a target market that shops at a limited number of stores. Sales in those stores are used to predict market response to the product and guide distribution for the full launch.

ACTIVITY-10

1.Create a storyboard your customer experience/feedback.

2.Create a poster with your questions to get customer feedback

3.Building models of your ideas using maker materials like cardboard.

4.Bringing your ideas to life digitally with a 3D modeling platform like Tinkercad.

5.Creating a detailed map or blueprint that outlines a solution to an authentic problem.

WORKSHEET -11

UNIT V

5.6 b) Celebrating the difference.

Celebrating differences in the design thinking process is crucial for fostering a diverse and inclusive environment. Here are some ways to celebrate and value individual differences in design thinking:

1. Embrace diversity: Create an inclusive design team that encompasses individuals with different backgrounds, experiences, and perspectives. Encourage diversity in terms of age, gender, race, culture, and expertise.

2. Foster collaboration: Encourage a collaborative and open-minded environment that allows team members to share their unique ideas and solutions. Facilitate interdisciplinary collaboration and provide opportunities for team members to learn from each other.

3. Challenge assumptions: Design thinking involves questioning assumptions and exploring new perspectives. Encourage team members to challenge their own assumptions and biases, while also valuing the diverse perspectives and insights of others.

4. Encourage experimentation: Design thinking is a process of experimentation and iteration. Emphasize that there are no right or wrong answers in the ideation phase and encourage team members to test and refine their ideas, even if they seem unconventional or risky.

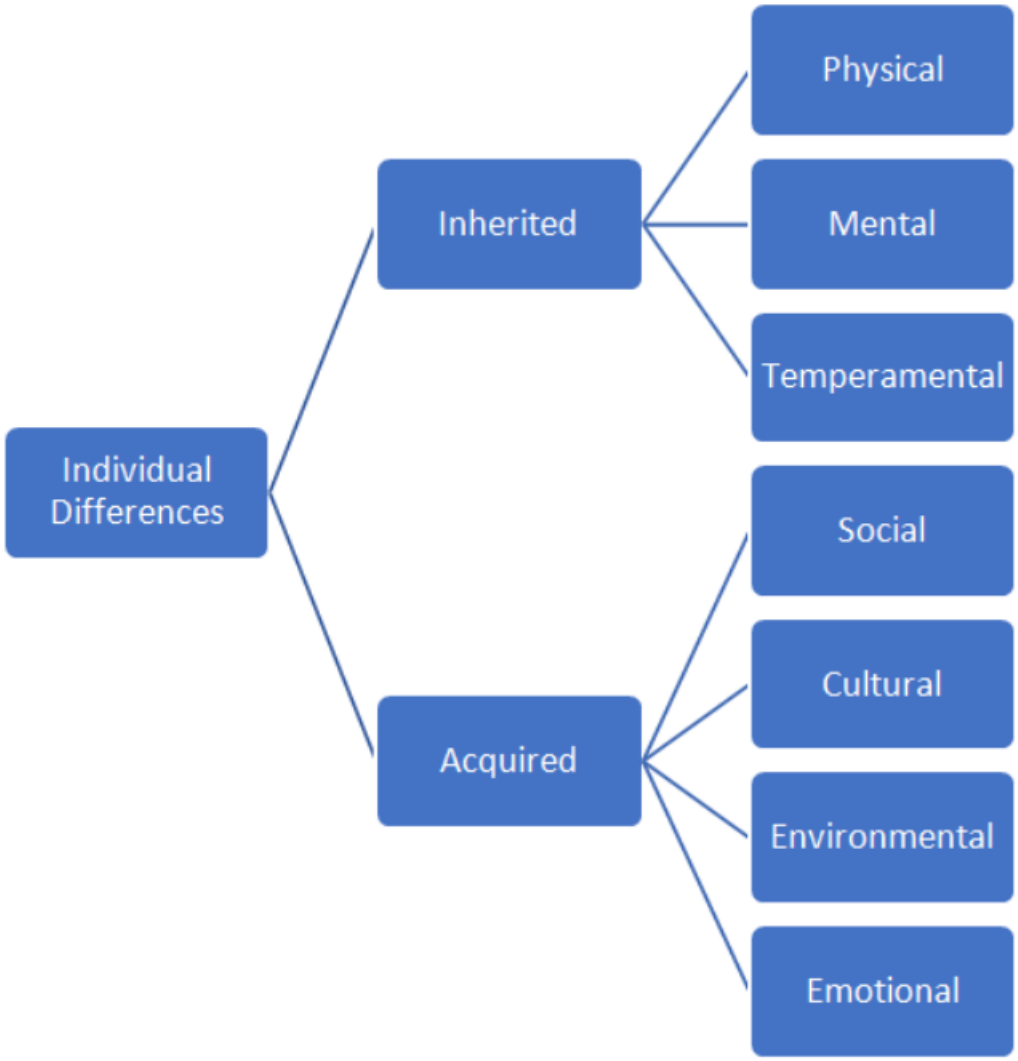
5. Appreciate different strengths: Recognize and appreciate the different strengths and skills that individuals bring to the design thinking process. Encourage team members to leverage their unique capabilities and contribute their expertise to solve complex problems.

6. Provide a safe space for feedback: Create a safe and inclusive space where team members can give and receive constructive feedback. Encourage active listening and empathy when providing feedback, and promote a growth mindset to embrace feedback as an opportunity for learning and improvement.

7. Recognize individual contributions: Celebrate and acknowledge the contributions of each team member throughout the design thinking process. Highlight the unique ideas, perspectives, and efforts of individuals, and encourage a culture of appreciation and recognition.

By celebrating and valuing individual differences in the design thinking process, teams can foster a more inclusive and innovative environment that leads to enhanced problem-solving and creative solutions. Design thinking is a problem-solving approach that aims to address complex problems and create innovative solutions. However, individual differences can influence the way people engage in design thinking. Here are a few examples of individual

differences in design thinking Here are A few examples of individual differences in design thinking:



Creativity: Some individuals may naturally possess a higher level of creativity, which can influence their ability to generate unique and innovative ideas during the design thinking process.

Experience: Design thinking often involves interdisciplinary collaboration. Individuals with diverse backgrounds and experiences can contribute different perspectives and insights, which can greatly enhance the quality of the design solutions.

Cognitive Abilities: Different individuals have different cognitive abilities, such as analytical thinking, problem-solving skills, and spatial reasoning. These abilities can impact the way people approach design challenges and find solutions.

Personality Traits: Personality traits, such as openness to new experiences, extraversion, or conscientiousness, can affect how individuals engage in design thinking. For example,

someone high in openness may embrace innovation and explore unconventional ideas, while someone high in conscientiousness may pay attention to detail and ensure precision in the design process.

Communication Styles: Effective communication is crucial for collaboration during the design thinking process. Individual differences in communication styles, such as assertiveness, listening skills, and verbal/nonverbal expression, can influence how people interact, share ideas, and receive feedback, ultimately impacting the overall design outcomes.

Risk Tolerance: Design thinking often involves taking risks and exploring uncharted territories. Individual differences in risk tolerance can impact how individuals approach and embrace ambiguity, uncertainty, and failure during the design thinking process.

It's important to recognize and value these individual differences in design thinking to create diverse and effective design teams. By leveraging the unique strengths and perspectives of individuals, design solutions can become more inclusive, innovative, and impactful.

You can provide feedback and recognition individually or collectively, verbally or in writing, during or after the discussion. Feedback and recognition can help your team members to improve their skills, boost their confidence, and motivate them to participate more actively in future discussions.

5.7)Group Discussion:- The group discussion round is critical because it allows interviewers to analyze candidates on a variety of parameters, including their level of confidence, teamwork qualities, communication, leadership, analytical, and logical skills.

How do you encourage others in a group?

For example, some people feel encouraged by:

sincere verbal praise that provides specific feedback about what they have done and that it is appreciated.

verbal praise in a team setting which showcases to others what is being done.

an email that recognises their effort which they can keep and re-read in their own time.

sincere verbal praise that provides specific feedback about what they have done and that it is appreciated.

verbal praise in a team setting which showcases to others what is being done.

an email that recognises their effort which they can keep and re-read in their own time.

Group activities enable students to discover deeper meaning in the content and improve thinking skills. The most effective use of group work is that which engages students with

higher-level content that is thought-provoking, difficult to understand, or has multiple interpretations.

ACTIVITY-11

1.Group discussion – Regarding any new product or project

2. Team work

a)Making models /charts

b)Seminar

c)Presentation

d)Brainstorming session

WORKSHEET-12

UNIT - VI

6.1)a) Design Thinking & Customer Centricity

Discover how design thinking and customer-centricity can revolutionize your product development and enhance customer experience.

Why Customer-Centric Approach Matters

Increased Customer Satisfaction

By prioritizing customer needs, you can create products that truly address their pain points, leading to higher satisfaction levels.

Competitive Advantage

A customer-centric approach sets you apart from your competitors by enabling you to create memorable and tailored experiences.

Customer Loyalty

When customers feel understood and valued, they are more likely to develop loyalty towards your brand and become advocates.

6.2)Practical Examples of Customer Challenges

Long Waiting Times

Explore how design thinking can help solve the challenge of long waiting times by streamlining processes and improving efficiency.

Complex Interfaces

Discover how design thinking can simplify complex interfaces, making them more intuitive and user-friendly for customers.

Unmet Expectations

Learn how **design thinking** can bridge the gap between customer expectations and product design, resulting in higher satisfaction.

6.3)Enhancing Customer Experience with Design Thinking

Empathize

Put yourself in the customer's shoes to understand their needs, pain points, and desires.

Ideate

Generate creative solutions and explore different possibilities to address customer challenges.

Prototype

Build interactive prototypes to visualize and test ideas, gathering valuable feedback from customers.

Test & Iterate

Continuously refine and improve your product through iterations based on customer feedback.

6.4)Parameters of Product Experience

Usability

Ensure your product is user-friendly, intuitive, and easy to navigate.

Reliability

Build trust by delivering a reliable product that consistently performs as expected.

Emotional Appeal

Create an emotional connection with customers through appealing aesthetics and delightful interactions.

6.5)Alignment of Customer Expectations with Product Design

Understanding Customer Needs

Learn how to gather insights and conduct user research to align your product with customer expectations.

Iterative Design Process

Discover the benefits of an iterative design approach that allows you to refine your product based on ongoing feedback.

Customer-Centric Evaluation

Explore evaluation techniques that prioritize customer feedback to measure the success of your product design.

Conclusion and Key Takeaways

Design thinking and customer-centricity are essential for creating products that meet customer needs.

Practical examples highlight the importance of addressing common customer challenges.

Enhance customer experience by following the design thinking process: empathize, ideate, prototype, test, and iterate.

Consider the key parameters of product experience: usability, reliability, and emotional appeal.

Align customer expectations with product design through user research and iterative design.

Activity and Experiential Learning Plan

Team Building Exercise

Students form small groups to brainstorm customer problems and design solutions using the design thinking process.

Case Study Analysis

Students analyze and present case studies of companies that have excelled at customer centricity and design thinking.

6.6)Product Design Challenge

Students design and prototype a product that addresses a specific customer challenge. They present their product to the class and receive feedback.

Teaching Innovative Product Design and Creative Solution

Teaching students how to craft innovative products requires an in-depth understanding of the design process and the ability to address a user's specific needs. In this course, we will cover everything from the feedback loop to rapid prototyping and final presentation.

ACTIVITY-12

ANSWER THE FOLLOWING QUESTIONS:-

1)How does Starbucks use design thinking?

2)How does Uber use design thinking?

3)How Nike uses design thinking to develop talent?

4)What is design thinking in UX?

5)Does Samsung use design thinking? Explain.

6)Do engineers use design thinking? Elaborate.

7)How is design thinking used by Pepsico?

8)Does Tesla use design thinking?Elucidate.

9)How do teachers use design thinking?

10)How did Oral B use design thinking?

WORKSHEET 13

UNIT- VI

6.7)B) Feedback, Re-Design & Re-Create

Identify Flaws

One major step in creating innovative products is identifying flaws in the design. By recognizing problems and flaws, we can move forward with the process of improvement and redesign.

Consistent Feedback

Consistent feedback throughout the design and creation process is essential. By providing feedback throughout the entire process, we can adjust and address any issues before the final product is released.

Continual Improvement

Continual improvement is a critical aspect of product design. By striving to improve each step of the way, students will be able to create revolutionary changes in a user's experience.

6.8)Feedback Loop

The feedback process should not occur only at the end of the design and creation process, but rather throughout. This helps us respond and adapt to current trends and users' needs, which is critical for the ultimate success of the final product.

6.9)Focus on User Experience

Usability Studies

Usability studies help us to create products that improve and simplify the user experience. It is essential to focus on the end user and how they will interact with the product in real-life situations.

What Does Usability Testing Actually Test?

Product teams can run usability tests to gain many types of data about their products. But most teams use these tests to learn the following:

Ease of use: Is the solution straightforward, self-explanatory, and easy to learn?

Efficiency: Are users able to complete each task with a minimum amount of time or clicks?

User-friendliness: When a user has trouble figuring out the next action or where to find a feature, does the system offer real-time help? And is this form of assistance itself easy to locate and use?

User Testing

User Testing :

Through user testing, we develop, iterate and refine our product to ensure that we have created a valuable user experience to meet our users' needs.

Customer Feedback :

Customer Feedback

By gathering customer feedback, we can delve deeper and discover the motivations, emotions, and actions of our users. This feedback is valuable in improving our understanding of how we can improve the user experience.

Address "Ergonomic Challenges"

Identifying Ergonomic Challenges

By understanding and identifying ergonomic challenges users face, we can design products to alleviate pain and discomfort.

Creating Solutions

Addressing ergonomic challenges often involves creative thinking to create solutions. By thinking outside of the box, we can often create innovative solutions that improve the user's experience.

6.10)User-Focused Design

User Personas	A user persona is a tool used to identify users types and their specific needs. This allows us to tailor the product design to meet the needs of the user.
Task Analysis	Task analysis is used to identify the tasks that the user performs. This allows us to create a product that is designed for efficient use of a user's time and efforts.
Decision Matrix	A decision matrix is used to weigh and prioritize different aspects of the product design. This helps us make informed decisions throughout the design process.

6.11)Rapid Prototyping & Testing

Prototyping

Prototyping is an iterative design phase that involves creating a simple version of the final product. This enables experimentation and testing on a smaller scale before the final product is developed.

Testing

Testing is a critical phase in product development that enables designers to gather feedback and ultimately improve the final product.

6.12)Final Product

Quality Control

Quality control is a critical aspect of delivering a final product that meets the needs of the user. By carefully analyzing and reviewing the final product, we can ensure it's functionality and usability.

Product Launch

To launch a product, we must create a comprehensive product launch strategy that meets the target audience's needs and demands. This ensures a successful final product.

Continuous Improvement

Product development does not end with the final product launch. Continuous improvement is critical for long-term success and creating a valuable user experience.

6.13)Final Presentation - "Solving Practical Engineering Problem through Innovative Product Design & Creative Solution"

Problem Identification

Problem Identification

The final presentation should always begin with identifying a practical engineering problem that the product solves.

Innovative Product Design

The innovative product design should be showcased and its effectiveness in solving the identified problem.

Creative Solutions

Creative solutions and problem-solving techniques in creating the final product should be highlighted to show how effective it is in accomplishing its task.

ACTIVITY - 13

1)PROTOTYPE CREATION

Create a basic prototype that addresses a practical engineering problem

2)USER FEEDBACK

Conduct user testing to get feedback on your prototype and iterate based on findings

3)FINAL PRESENTATION

Present your final solution to stakeholders demonstrating the problem -solving process and innovative solution