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Design Thinking: A Creative Teaching Practice

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Abstract

Design Thinking is an ideology and a process; it's all about solving complex problems in a user-centric way. It was created as a way of taking the processes and approaches that designers use and applying them to problems that designers don't typically encounter. This approach is been widely used in the food and healthcare industry even in the design field or any field where the consumers and their needs are at the core. Various studies showed design thinking as an effective instructional methodology to develop students' creativity, innovation, collaboration, and non-linear problem-solving skills, among the 21st-century skills. In a typical classroom scenario, the teacher asks students questions accepting a 'right answer' from them without giving any importance to the creative and holistic development of the students. NEP 2020 primarily focuses on the conceptual understanding of the students. It is a teacher's responsibility to provide students with an interactive classroom environment for developing 21st-century skills and competencies among them. The author's ubiquitous goal is to present Design Thinking as an effective and creative teaching practice.

Keywords: Design Thinking, innovative teaching practice, creative thinking, 21st century skill, design process

In a conventional classroom, the teacher poses questions to the class and accepts a "right answer" from them, placing little value on students' creativity and all-compassing growth. There is only one correct response to the question; all the other responses are deemed incorrect and may result in disciplinary action against the students. A teacher must provide an engaging learning environment for pupils that fosters the development of 21st–century competencies. The design thinking approach was created with the 4Cs of 21st–century skills- collaboration, creativity, critical thinking, and communication- in mind. The design thinking process has gained widespread acceptance as a teaching methodology in designing schools during the past few decades. Tim Brown, a pioneer of design thinking, talks about the benefits of design thinking in addressing really difficult problems. "Building to think instead of thinking about what to build" is the strategy he advocated in his 2009 TED(Technology, entertainment and/or design) presentation. This method has been extensively applied in the food and healthcare sectors, as well as in the design business and other fields where customer demands come first. Every stage of the design process should incorporate design thinking techniques and tactics. Today, Design Thinking is not just utilised in several other disciplines, including business, science, engineering, music, and literature. The use of design thinking in the classroom is widely acknowledged because it inspires students to become problem solvers.

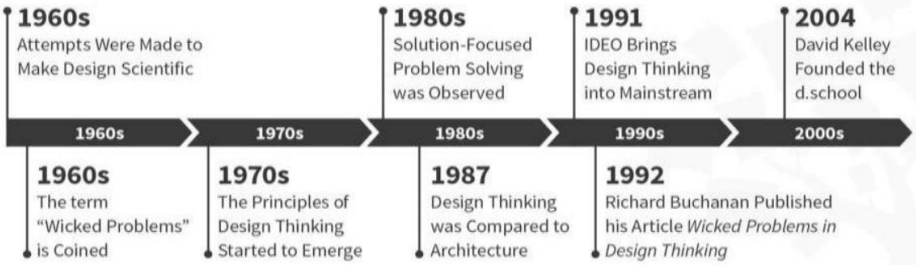
John Dewey said, " If we teach today's students like we taught yesterday. We rob them from tomorrow". Studies conducted have demonstrated the efficacy of design thinking as an instructional tool for fostering students' 21st-century skills. Research is being done in the area of design thinking, which is primarily concerned with designing, managing, etc. Teachers and students can improve their imagination, reasoning

skills, and creativity by using the Design Thinking method in the classroom to tackle problems that are essential for surviving in the rapidly changing 21st century. Schools adopt this approach nowadays to motivate the quality of problem-solving. The dynamics of the teaching-learning process are assessed in terms of learning outcomes in the dynamic environment. Since the foundation of every educational institution is its pupils. For the students' overall growth, the teacher must implement a variety of innovations in the classroom.

History of Design Thinking Process

The concept of Design Thinking dates to the 1950s and 1960s, although was majorly used in the field of engineering and architecture (see Figure 1).

Figure 1 Timeline for Design Thinking Process



In 1991, IDEO was one of the companies that brought design thinking into the mainstream. They develop the design thinking process for their customer with satisfactory steps and tools. In 1992, Richard Buchanan, the Head of Design at Carnegie Mellon University, published his article "Wicked Problems in Design Thinking", which discussed the origin of Design Thinking. He added that design thinking is a means to integrate these highly specialized fields of knowledge to solve the real-life problems of today's world and form a holistic perspective. David Kelley from the Hasso Plattner Institute of Design at Stanford- commonly known as the d. school in 2004, works in the development and implementation of design thinking as one of its central goals since inception, and it serves as a source of huge inspiration to design thinkers across the world. The design thinking movement is rapidly gaining ground- with pioneers like IDEO and the d. school paving out the others to follow. Design thinking is a concept which is now a day's used in all fields to enhance creativity and innovation throughout the process.

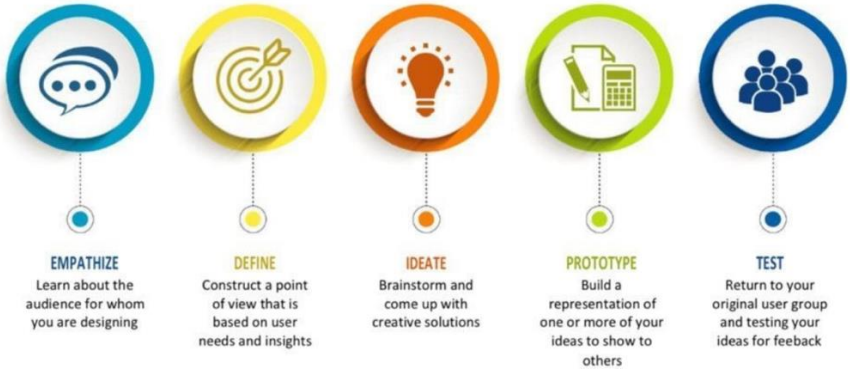
The Design Thinking Process is a human-centred approach as the students are the centre of the teaching-learning process, which allows the students to work in collaboration with peers to bring up solutions, as several great minds are stronger when solving a challenge than just one, it is an optimistic and a highly creative approach where they are given hands-on experience through prototype and later their ideas are tested and they present their ideas in front of experts to know their applicability. It is a process for coming up with answers and solving problems in a realistic, imaginative way. It is a type of solution-focused or solution-based thinking that aims to generate an urgently needed solution to a problem. The five discrete stages of the Design Thinking process are empathy, define, ideate, prototype and test. The Hasso Plattner Institute of Design at Stanford University (D-school) came up with this Design Thinking approach. While the number of steps and titles given to each stage may vary throughout organizations, all models share the same foundation. The model's phases change according to the focus group. The widely used five-stage model provided by the Hasso Plattner Institute of Design at Stanford University (D-school), is used by the

Atal Innovation Mission in India.

Stages of Design Thinking

Design Thinking majorly comprises of five stages which can be changed depending on the problem chosen and the focus group, but each step must be completed for the problem to be fully solved and for the students to be able to analyse and apply critical thinking to the problem-solving process. The name of the stages is named according to the researcher and the problem chosen for the research (see Figure 2)

Figure 2 The Steps of Design Thinking Process



Empathy/Observe/Research:

Empathy is the ability to put oneself in another person's shoes or to begin "seeing" things through their eyes. It is the capacity to comprehend or experience what another person is going through from within their frame of reference. To discover problems, the students attempt to visualize themselves in the circumstances in which they can empathise by seeing, thinking, and experiencing. Here, the teacher's job is to help them along the way. The three phases of the empathise step are observed, interact, and immerse. To proceed to the second step, which is defining the problem, the students must first observe a specific setting or scenario. Later, they must engage with and immerse themselves in the situation.

Define/Understand/Analyse:

After identifying and comprehending the issue, the student defines it in this phase. Here, the instructor helps the pupils comprehend the three components of a point of view: the user, the need, and the insight. In Design Thinking, the Point of View (POV) statement facilitates the move into the define step.

Ideate/Alternate/Create:

During the ideate stage, design thinkers use imaginative exercises like brainstorming to generate ideas in the form of queries and answers. Using inventiveness and imaginative thinking to discover solutions is the goal of this stage. The ideation stage can be facilitated by a variety of techniques, including mind maps, brainstorming, brainwriting, etc.

Prototype/Build/Detail:

Students here need to give their ideas in a concrete form to validate their ideas. The role of the teacher is to give necessary feedback and suggestions for the prototype. At this stage, the students are given the perfect setup to give them a concrete form. The teacher here provides the requirements.

Test/Evaluate/Reflect/Implement:

This is the last step, here the students present their prototype and the idea behind the prototype to the teacher. This step will help determine what works and what does not. The teacher can seek the help of an expert in this step. Sometimes this step may land students back to the ideate stage. The ideas are presented which helps in gaining a deep understanding of the concept attained after going through all the five stages. The steps of design thinking mentioned are not sequential; they can happen simultaneously and can be repeated as often as necessary. The five phases don't always happen in that order; they don't follow a set pattern.

Foundation for Design Thinking

The researcher reviewed various theories which acted as a foundation of design thinking. Various psychologists and researchers have laid the foundational theory which frames the conceptual base of the design thinking process. Table 1 presents the theories of the Indian Philosophers theoretical relevance to the Design Thinking whereas Table 2 shows the Western Philosophers theoretical relevance to the Design Thinking process.

Table 1 Relevance of Indian Philosophical Educational ideology/theories to the Design Thinking Process

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
Swami Vivekananda	Idealist thought and spiritualism	Swami Vivekananda advocated that it is the role of teacher that facilitates students and to create an environment for self-learning.	The Design Thinking process relates to Vivekananda's view in a way that the Design Thinking process, allows the students to work freely and attain the concept by self-learning, where the teacher only works as a facilitator.
Mahatma Gandhi	Craft-centred education	Mahatma Gandhi believed that the craft-centred education motivates collaborative and co-operative activities, this type of education makes the student self-sufficient and develops all-round development.	The views of Gandhiji advocates to the stage of Ideate where students come up with the basic idea of the concept and work in groups and they also keep their

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
			idea in the front of the teacher in the Test stage. The students use their creative skills in developing the concept creatively in the Prototype stage.
Rabindranath Tagore	Activity-based curriculum	Tagore believed that educator should follow the concept of freedom. He also focused on keeping the education a student-centred one and the teacher's major role is to motivate and provide a facilitating environment for the child to learn on his own. Tagore's ideas also emphasized the need for teachers to be lifelong learners since they can never effectively instruct students until they too are lifelong learners.	The Design Thinking process itself needs a lot of planning and detailed study of the concept so that the execution becomes smooth.
Jiddu Krishnamurti	Exploration, observation, and experimentation	Jiddu Krishnamurti claims that a true teacher is not just a content expert but also one who shows his students the way to wisdom and truth.	Design Thinking lays an emphasis on the same views as that of Krishnamurti's view where the teacher must be an expert in the content so that they can focus on the concept clarity of the content.
Sri Aurbindo Ghosh	Learning-by doing	He believed that nothing can be taught, but everything can be learned. Aurbindo states that teacher is helper/facilitator and guide, but not an instructor. He emphasized that education by self-experiences is the best way of teaching.	Aurbindo Ghosh's theory relates to the Design Thinking as the stages are designed in the same manner where the educator works

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
			as an engine who drives the students towards the destination. The stages of defining and ideating works well with his views.
Gijubhai Bhadeka	Child-centered education	Gijubhai Bhadeka emphasized on fear-free education where students feel free to perform their activities. He believed in dealing with the children with complete empathy. He believes that the teacher should know the basic principle and then help the children to understand through interesting activities and experimentation is the key to attain conceptual knowledge. For him, the teacher has to be a friend, philosopher and guide.	Gijubhai Bhadeka's views directly relates to the Ideate and Define stage where the students are made to think and draw the concept on their own and even the Prototype stage where the teacher is the facilitator and works as a guide.

Table 2 Relevance of Western Philosophical Educational ideas/theories to the Design Thinking Process

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
Lev Vygotsky	Theory of learning and development	Vygotsky's sociocultural theory of cognitive development highlights the importance of social interaction, language, and cultural factors in shaping an individual's cognitive abilities. The Zone of proximal development highlights the importance of providing appropriate support and guidance to learners, enabling them to reach higher levels of cognitive functioning.	Zone of proximal development represents to the Prototype stage in which the learners are made to work in groups, whereas the whole theory corelates with DT where the learners are made to construct a deep

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
			understanding of the concept.
Jerome Bruner	Discovery learning theory	According to Bruner's theory, learners should be encouraged to discover and construct their knowledge through hands-on exploration and problem-solving activities. He also believed that learners are more likely to understand and retain information when they actively engage with the learning material and discover concepts for themselves.	The Discovery learning theory advocated the two crucial stages of DT i.e., the ideate and prototype stages.
Jean Piaget	Cognitive Constructivism	Jean Piaget emphasized on hands-on exploration and concrete experiences in facilitating cognitive development, he believed that children learn best when they are actively engaged with their environment, manipulate objects, and interacts with their peers.	DT phases that relate to Jean Piaget's theory are the ideate and the prototype. The DT advocates that the learners learn best when they discuss what they observed in the first stage and discuss during the ideate phase with their peers.
Newell and Simon	Problem-Solving Model	According to Newell and Simon's method, which is predicated on the problem space hypothesis, where an individual is measured by the reasons they keep and the actions to be taken to reach the objectives. The solutions are the outcomes of an individual's understanding of the problem. Selecting the potential courses of the actions is the goal of the problem solving.	The Design Thinking is itself formulated keeping in finding out the solution to a particular problem which the title of the Newell and Simon's theory.
David Kolb	Experiential Theory	Kolb's experiential learning theory emphasizes the importance of active engagement, reflection, and the integration of theory and practice in the	The Kolb's theory active engagement lays focus on the ideate stage whereas

Psychologist/ Researcher	Name of the Theory or basis of ideology	Theoretical Outcomes	Relevance to Design Thinking and its steps
		learning process. It has been widely applied in educational settings, training programs, and professional development to enhance learning experiences and promote the transfer of knowledge and skills to real-world contexts.	the reflection deals with the prototype stage of the design thinking phases.
Edgar Dale	Cone of Experience	The model serves as a visual representation to emphasize the benefits of active learning and encourage educators to incorporate interactive and participatory approaches into their teaching methods.	This model also lays emphasis on whole DT stages, where the educators engage the learners in teaching-learning process.
J.P. Guilford	Structure of Intellect (SOI)	The SOI framework aims to understand and measure human intelligence and creativity. The three main components of the model are operations which deals with the cognitive functioning, contents that deals with the intellectual abilities and products being the third component that is the combination of operation and contents.	Guilford's theory all the three components directly lays the foundation for the Design Thinking as a whole.
Jean Lave and Etienne Wenger	Situated Learning Theory	Lave and Wenger's theory states the importance of promoting such environments that promote active engagement, social interaction, and participation in authentic activities. The theory emphasizes the social and cultural aspects of learning and the role of communities in shaping individual learning experiences and outcomes.	The steps which relate to the Situated Learning Theory are the ideate, define, and prototype stages of the Design Thinking. Social interaction is the crucial step in DT process which leads the students to come up with solutions.

Comparison between Indian and Western Philosophers

The design thinking process takes the central idea from Indian and Western philosophies to a major extent. The views laid by both ideologies gave a concrete idea of the Design Thinking process. Mahatma Gandhi, Rabindranath Tagore, Jiddu Krishnamurti, Sri Aurobindo Ghosh and Gijubhai Bhadeka were vocal about

activity-based learning where students are taught using activities and experiments. The education should be child-centred, and children should be taught by empathy was advocated by Gijubhai Bhadeka which is the focus of the Design Thinking process. Similarly, western philosophers like Bruner, Piaget, Newell and Simon, Kolb, Dale, Jean Lave and Etienne Wenger highlight the importance of creating an environment which promotes experience-centred learning where the learning becomes the best when the teaching is done keeping in mind the conceptual understanding and student at the centre. Western philosophers like Guildford and Piaget's theory kept the weight upon the child's intellectual ability and cognitive constructivism, respectively.

Conclusion

The application of Design Thinking in education emerged as a novel method for instructing students in problem-solving techniques. Deep empathy and comprehension of human needs and motivation are the foundations of Design Thinking. John Dewey said, " If we teach today's students like we taught yesterday. We rob them from tomorrow". The present paper provides a strong framework for taking on challenging issues, encouraging creativity, and developing solutions that satisfy the demands of users and stakeholders through Design Thinking. When used in the teaching-learning process, this method would be useful in cultivating 21st-century skills interactively and collaboratively. The process of design thinking is an effective tool, which allows students to come up with solutions on their own. The teacher should utilise this method to enhance the deep understanding of the content to be taught, this method should be included as one of the crucial pedagogical practices.

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