Bridging India's Design Gap

'A White Paper By'

We-Learn™ Creative Learning Spaces | NATIONAL RESEARCH DEVELOPMENT CORPORATION | Universal AI University The future is here | SN MENTORING™ ISO 9001:2015 CERTIFIED

VISION

2047

DEVELOPED INDIA

Bridging India’s Design Gap

Bridging the Gap Between Academic Instruction and Industry Innovation for a 2047 Viksit Bharat vision

A white paper by Design Education experts at We Learn and Career Mentorship Experts at SN Mentoring Consultancy Services under the institutional patronage of Universal AI University and National Research Development Corporation

Message from National Research Development Corporation

Commodore (Retd.) Amit Rastogi
Chairman & Managing Director,
National Research Development Corporation

In line with the Vision of Viksit Bharat@2047, NRDC shall strategically position itself as a national technology commercialization and innovation facilitation hub by strengthening its Design Clinic Facility (DCF), System Engineering Lab (SEL), and other consultancy services for start-ups, MSMEs, academia, and research institutions. The integrated ecosystem of Design Support, System Engineering, Intellectual Property Facilitation, TRL Assessment, Technology & IP Valuation, and Technology Transfer can significantly contribute towards transforming research outcomes into commercially viable products and scalable enterprises.

Beyond technology development, innovation-driven growth also requires strong mentorship, creative thinking, and future-oriented educational ecosystems.

The contributions of professionals such as Ms. Neha Pandit, who promotes creative expression among students, Mr. Saurabh Nanda, whose framework-based mentorship methodologies have demonstrated global relevance, and Universal AI, India's first AI University, reflect the growing strength of India's innovation and knowledge ecosystem. Their work complements the broader national objective of nurturing talent, fostering entrepreneurship, and building globally competitive technologies.

Over the past seven decades, NRDC has witnessed multiple transformations in industry, technology, and education, and it is encouraging to observe India emerging as a source of world-class educational professionals, innovation services, and visionary leadership.

By fostering stronger linkages between technology, education, design, mentorship, and commercialization, NRDC can play a pivotal role in supporting India's journey towards becoming a global technology and innovation leader by 2047.

Message from Universal Ai University

Mr. Tarun Anand
Founder & Chancellor - Universal Ai University

As we shape the future of education, the emphasis must be placed not on the amount of information students can collect, but on the skills they develop to think, adapt, collaborate, and innovate. This will enable students to succeed in a world that is unpredictable and constantly evolving.

AI is a technology that is changing the world and has an impact on almost every industry and profession. Universities must not continue operating as static institutions. Instead, they must utilize a new model. The new model must be flexible and utilize technology in combination with other disciplines and creativity, and apply all of these to the real world. At Universal Ai University, we are motivated by this belief.

While most new education institutions have an aim of building a school, our goal has always been to create an entire ecosystem that is future oriented. We not only seek to prepare Indian youth for their first job, but to prepare them for ongoing relevance in an AI world. This is the reason why AI is integrated with every subject, including management, engineering, psychology, liberal arts, design, media, and emerging technologies.

With an emphasis on thinking across disciplines, students will be encouraged to work and think outside the box. Education is in need of having an emphasis on the integration of creative thinking, and people-centered problem solving as they are of great importance. Projects that are collaborative and innovative, design thinking and experiential types of learning are just a few of the ways that students are able to learn.

The goal of the future belongs to those who possess the ability to integrate technology and human needs, as well as the ability to integrate logic and imagination, data and empathy, and intelligence with execution.
Universal Ai University is directed by an ecosystem and leadership that strengthens this belief. Dr. Simon Mak, an MIT graduate and Silicon Valley entrepreneur and Founding Vice Chancellor, is joined by 60+ CEOs and industry leaders on the Board of Governors. Thus, the University is always closing the gap between the world of the university and that of the global economy.

CMAPS (Collaborative Multidisciplinary Approach towards Problem Solving) is an example of this wherein students are able, from the very beginning of their academic careers, to tackle challenges faced by real industry players. Students are not just learning concepts but are learning how to apply them to the real world.

As the world continues to evolve at unprecedented speed, institutions must move from being centres of instruction to centres of transformation.

The future of education lies not in choosing between technology and creativity, but in integrating both meaningfully. And that, perhaps, will define the next generation of globally relevant universities and future-ready learners.

Message from We-Learn

Mrs. Neha Pandit
Founder & CEO - We Learn

With industries evolving, there has been a prominent and growing disconnect between what students learn and what the world really demands. We-Learn was founded with the simple mission to bridge the gap between traditional education and real-world application. The foundation to eliminate this gap stems from Design Education. Design Education focuses on integrating creativity, engineering principles, sustainability and business thinking, helping students prepare for real challenges beyond the classroom.

This white paper outlines how Design Education can be integrated and implemented across different stages of learning to ensure continuity, depth and impact. It is a strategic guide for educators, institutions, and industry leaders on how to adopt a future-ready learning approach.

At We-Learn, our aim is to nurture a generation of innovators who are thinkers and makers. We are committed to building our students' confidence to equip them with not just participating in the future, but also to designing it. We strongly believe that the future of education does not lie in the accumulation of knowledge, but in the ability to think, apply, create, and innovate. We aim to move away from the myth that design is a specialized skill. Design thinking is a foundational skill that empowers learners to imagine solutions, with the basis of critical thinking.

With the speed at which the world is rapidly evolving, it is essential that students go beyond classroom learning. They must learn how to construct, deconstruct, and reconstruct by observing problems, breaking them down, experimenting with ideas, and bringing solutions to life. Design thinking paves the way for design thinking which nurtures the learner's mindset by combining creativity with structured problem-solving, using both the left brain, which is dominant for critical thinking abilities and logic and the right brain, which governs the creative thinking abilities and visual imagination.

This white paper reflects our vision of transforming education into a hands-on, interdisciplinary experience where students are not passive learners, but active creators. At its core, design thinking is an important stepping stone towards design engineering.

Design engineering focuses on building the aptitude and attitude to not just think laterally, but also to accept exploration, experimentation and experience to truly understand experiential learning. This empowers the learner to accept failure, to iterate, and ultimately, to innovate.

Message from SN Mentoring Consultancy Services

Mr. Saurabh Nanda
Founder & CEO - SN Mentoring Consultancy Services

Why do humans create? Because we can. Humans have been drawing and designing things for centuries. It evolved from simple self portraits to depictions of daily life to story telling to encoding long complex messages for future generations.

Design and art is how we have shared our knowledge with our future generations, something other animals have not been able to. We design, we draw, we create, we write, we encode, we decipher - language, art forms, buildings, everyday objects, clothes and concepts alike. Our way of thinking is design.

As we have evolved, and discovered materials and civilisational objectives, we have designed both the tangible and intangible.

So what does a population, at the cusp of evolutionary change due to AI, design today? What does a population from India, which is majorly a visual thinking population, design? For whom do we design and how do we design are today's questions that should keep educators and policy makers awake at night.

Today's design languages and principles need to help entrepreneurs solve problems better, help use technology for doing good and making our way of life sustainable, unlock potential of our youth which are not being pushed into 20th century mechanical careers, allow experienced teachers tap into their vast wisdom to create remarkable change, give career mentors access to tools to talk to prodigies who would otherwise lose out on their own potential.

This white paper written with Neha Pandit, a design teacher extraordinaire, and under the patronage of the Universal AI University, its design school faculty and India's premier body for intellectual property transfer, National Research Development Corporation, showcases the clear and present need to harness human creativity in its purest form without the pollution of debilitating civilisational imperatives of the 20th century. We wish to convey that design is in every human being and it can not be considered a hobby, a part time vocation to curate your 'creative' and 'emotional' needs. It is foundational and it is the backbone for AI training and to create a 21st century world which works for everyone. Our energy, technology, policy, food needs are now available which means we need to embark on the journey to transform.

This white paper is an attempt to define how design education will transform our ways of doing things and living as human beings. It describes the roles and interventions for students, educators, counsellors, institutions and policy makers alike.

Executive Summary

India is entering a decisive era in its developmental trajectory. As the nation advances toward the vision of ***Viksit Bharat 2047,*** global competitiveness will increasingly depend not merely on access to labour, infrastructure, or capital, but on a nation's ability to innovate, create intellectual property, commercialize research, solve complex societal challenges, and design globally relevant systems and products.

Despite possessing one of the world's largest youth populations, a rapidly growing startup ecosystem, strong engineering capabilities, and expanding digital infrastructure, India faces a critical structural challenge: the disconnect between academic instruction and industry innovation.

Educational institutions continue to prioritize memorization, examination performance, and linear instruction, while industries increasingly demand systems thinking, creativity, interdisciplinary collaboration, adaptability, rapid prototyping, and user-centered innovation.
This disconnect has created what may be termed the "Design Gap" — a systemic absence of Design Thinking methodologies across the educational and innovation pipeline.

The consequences are significant:
- Research that fails to reach commercialization
- Technological innovation without usability
- Low patent conversion rates
- Limited product innovation ecosystems
- Skill mismatches between graduates and industry
- Weak interdisciplinary collaboration
- Reduced adaptability in the AI era

This white paper proposes Design Thinking not as an isolated creative discipline, but as a national strategic capability essential for India's transition from a knowledge economy to an innovation economy.

The paper presents:
- A framework for integrating Design Thinking into K–12, undergraduate, and industry-linked education
- A roadmap for aligning education with NEP 2020
- The role of psychometric and aptitude-based learning pathways
- The importance of intellectual property literacy
- The impact of AI on cognition and education
- A national Design-to-Deployment ecosystem model
- A strategic implementation framework involving industry, academia, startups, and government institutions
- The pivotal operationalization of innovation-to-market ecosystems

The long-term objective is clear:
To create a sovereign Indian innovation workforce capable not merely of participating in the future economy, but of designing it.

The paper is a snapshot for this objective created by designers, design educators working at K12 levels, design career experts, higher education experts and industry experts, hence completing the loop for policy recommendations.

1. India's Innovation Inflection Point

India stands at a rare historical convergence. The country simultaneously possesses:

- One of the largest youth populations globally
- Rapid digital transformation
- Expanding startup ecosystems
- Strong engineering and scientific talent
- Large-scale manufacturing ambitions
- Growing investments in deep technology
- Expanding AI adoption
- A globally competitive IT ecosystem
- Ambitions for leadership in space, biotechnology, defense, clean energy, and advanced manufacturing

However, innovation leadership is not determined solely by technological capability.

History demonstrates that nations become innovation leaders when they successfully integrate:

- Research
- Design
- Systems engineering
- Human-centered thinking
- Intellectual property creation
- Entrepreneurship
- Commercialization

The future global economy will increasingly reward nations capable of transforming ideas into deployable systems, experiences, and products. This is fundamentally a design capability.

2. Design as a Strategic National Capability

Traditionally, design has been misunderstood as a downstream aesthetic activity associated with styling or visual communication.

In modern innovation ecosystems, design has evolved into something far more significant. Design today represents:

- Systems thinking
- Human-centered innovation
- Product strategy
- Problem framing
- Experience creation
- Technology translation
- Interdisciplinary integration
- Rapid experimentation
- Market adaptation

Design is where invention becomes innovation. A scientific breakthrough without usability rarely reaches adoption. An engineering achievement without human-centered integration often fails commercially.

A technology without accessibility remains underutilized. Design bridges these gaps.

This is why leading global innovation ecosystems increasingly integrate design into:

- Engineering education
- Entrepreneurship ecosystems
- Product development
- Healthcare systems
- Public policy
- Technology commercialization
- Sustainability frameworks

2.1 Design Education: The Engine of "Viksit Bharat 2047"

The vision of a "Developed India" by 2047 rests on transitioning from a Service-Led Economy to an Innovation-Led Economy. Design education is the "software" that will run this hardware.

- From "Make in India" to "Design in India": For India to become a global manufacturing hub, it must first own the design rights. Design education empowers youth to create high-value products that define global standards, ensuring that "Viksit Bharat" is built on indigenous IP.
- Solving Local Challenges at Scale: A developed nation requires sustainable urban planning, efficient healthcare delivery, and waste management.

  By embedding design thinking in schools today, we prepare the 2047 workforce to approach these national challenges with a human-centric, systems-thinking lens.
- Economic Inclusivity: Design education democratizes innovation. It gives youth in Tier 2 and Tier 3 cities the tools to solve local problems—agricultural inefficiencies or rural energy gaps—creating decentralized economic growth essential for a developed nation.

For India, design education must therefore evolve from a niche academic specialization into a foundational capability embedded across disciplines.

3. The Structural Cost of the "Design Gap"

3.1 The Persistence of Rote Learning

The current Indian education system largely emphasizes memorization and standardized evaluation, often limiting opportunities for creativity and applied learning. There is a gap in approaches to teaching, as well as in approaches to learning.

A substantial portion of Indian education continues to emphasize:

- Information retention
- Standardized testing
- Procedural execution
- Theory-heavy instruction
- Fixed-answer evaluation

While these systems may produce competent exam performers, they often fail to cultivate:

- Independent thinking
- Curiosity
- Experimentation
- Resilience
- Systems-level understanding
- Innovation capability

This creates graduates who are highly trainable, but not always adaptable.

3.2 The Impact of lack of Design Education in India

The absence of Design Education in India has resulted in several gaps in the education system that has also directly affected job industries. The major disconnect exists because students graduate without any practical experience. Limited exposure restricts students from excelling in innovation-driven fields.

Traditional Education has impacted India in many ways, ways that often go unnoticed:

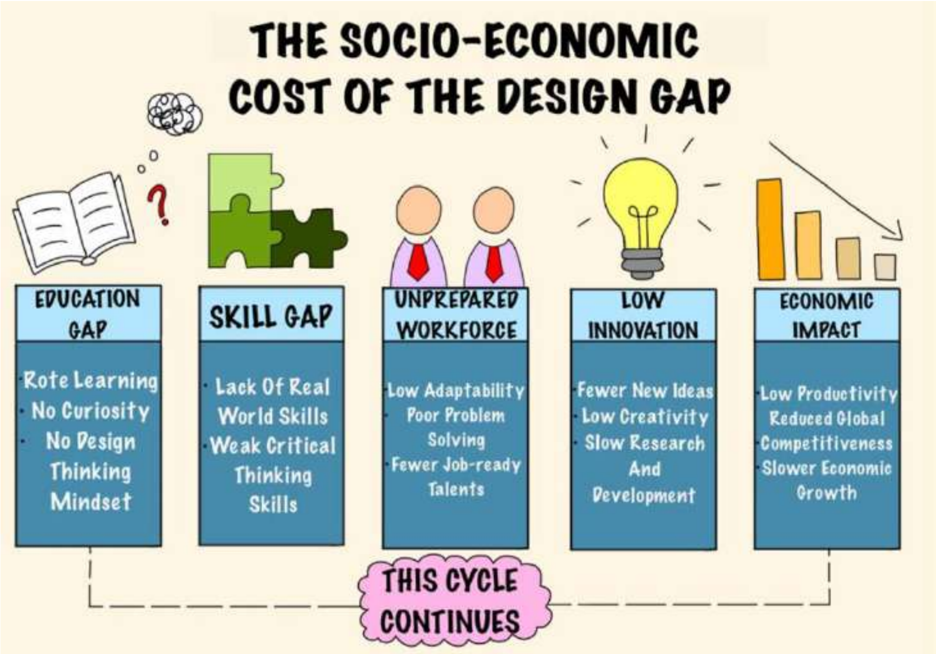
- The prioritization of rote learning over application results in students struggling with problem solving.

- Students lack creative thinking, expression and confidence as the majority of what was taught in school was on the basis of memorization. This results in under-performing, when it comes to ideation, experimentation and innovation.
- Industries are looking for leaders, innovators, creators who can understand what consumers want and are able to adapt to their needs. This comes from a place of a deficit in user-centric thinking.

What is happening in the classroom with students?	**What is happening in the classroom with teachers?**	**What are students struggling with?**
Students do not transfer learning on their own and students are bored by their school work	Teaching methodology does not demand high order thinking often enough	Unfamiliar reading passages and failure to use the writing process if not prompted to do so
Students don't know what to do when stuck	Teaching methodology overlook long term goals and end up as coverage	Unfamiliar versions of subject problems and no obvious prompts or clues as to which context applies
Students think successful learning is just accurate recall	Teaching methodology use low-level assessment items that do not check for real understanding	Not answering the test question; failure to stop and consider: what does this task/ problem/question demand

The World Economic Forum (WEF) Future of Jobs Report 2023 identified "Analytical Thinking " and "Creative Thinking" as two of the most important skills for the future (ref. World Economic Forum). Lack of Design Education results in students entering the workforce without the skills they need to excel.

The Socio-Economic Cost of the Design Gap



The absence of design education does not merely result in "unprepared students"; it creates a structural weakness in the Indian economy.

- **The "Execution-Only" Trap:** Without design education, Indian youth are conditioned to be "executors" rather than "architects." This leads to a workforce that excels at following instructions (back-office operations, maintenance) but struggles to lead in product conceptualization. This keeps India at the lower end of the global value chain.
- **Cognitive Rigidity and Career Fragility:** Rote learning creates a "fragile" mindset. When a specific industry faces disruption (like AI in software testing or basic coding), youth who lack design-led adaptability find it difficult to pivot. Design education builds cognitive flexibility, allowing youth to view career shifts as "iterative pivots" rather than failures.
- **The Stagnation of "Jugaad":** While India is famous for Jugaad (frugal innovation), it is often a temporary fix rather than a scalable solution. A lack of formal design education prevents Jugaad from evolving into Systemic Innovation. This costs the nation billions in lost intellectual property (IP) and global patents.

3.3 The "Execution-Only" Workforce Problem

India has historically become a global leader in execution-driven industries such as IT services and outsourcing, diamond processing or cashew processing.

However, future economic leadership will increasingly emerge from:

- Product ownership
- IP generation
- Design leadership
- Platform creation
- Deep-tech commercialization

Without Design Thinking frameworks, educational systems tend to produce:

- Executors instead of creators
- Operators instead of innovators
- Specialists without systems-level integration

This limits India's ability to climb global value chains.

3.4 The Valley Between Research and Commercialization

India produces significant academic research and technical talent.

However, many research outcomes fail to become:

- Products
- Startups
- Deployable technologies
- Scalable innovations

Globally, this gap is often referred to as the "**Valley of Death**" between invention and commercialization.

Design Thinking is one of the most effective mechanisms for bridging this divide because it introduces:

- User-centered validation
- Rapid prototyping
- Iterative testing
- Market desirability
- Experience design
- Systems integration

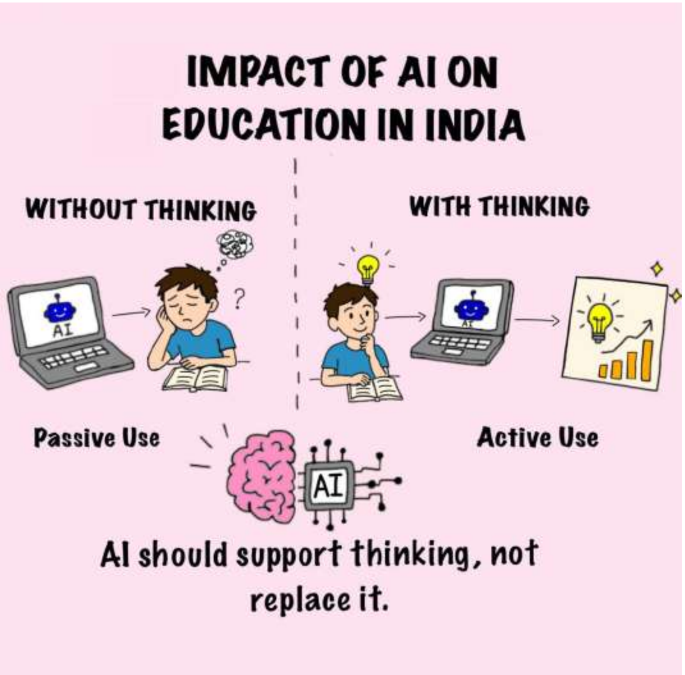
4. The AI Era and the Cognitive Crisis

Artificial Intelligence is reshaping global education and work.

While AI introduces extraordinary opportunities for productivity and access to knowledge, it also creates new educational risks.

4.1 The Impact of AI on Education in India

The integration of Generative AI in the hands of untrained students has created a crisis of outsourced cognition. While AI is a powerful tool, its current application by Indian students often acts as a bypass for the very friction required for intellectual growth.



The Cognitive Shortcut Trap

Traditional academic benchmarks like essays, summaries, and reports were designed to test a student's ability to synthesize information. When these are outsourced to AI, there is:

- Loss of Synthesis: Students no longer digest information, they transfer it. This prevents the transition of data from short-term memory to long-term conceptual understanding.
- The Illusion of Competence: AI generates polished outputs that mask a student's underlying lack of understanding. This creates a competence bubble that bursts the moment the student enters a practical, high-stakes professional environment where AI cannot provide the practical solution required.
- Research Ineptitude: The search and verify muscle is weakening. Students do not have the ability to distinguish between hallucinated AI data and empirical facts, leading to a generation that struggles with information literacy.

If our curriculum does not adapt, the "Viksit Bharat" vision faces a significant talent bottleneck:

- Undergraduate Decay: Professors will receive students who have high grades but zero Intellectual Stamina i.e. the ability to sit with a complex problem for hours without an instant answer.
- The Mid-Level Management Crisis: As AI automates entry-level tasks, the job market will only reward those who can perform High-Order Design Thinking. If our youth are trained only in tasks AI can do, they will enter a job market that no longer has a place for them.

4.2 Human Skills Become the New Competitive Advantage

As AI automates routine execution, the highest-value human capabilities become:

- Creativity
- Strategic thinking
- Adaptability
- Systems thinking
- Emotional intelligence
- Communication
- Interdisciplinary integration
- Ethical decision-making

According to the World Economic Forum's Future of Jobs Report 2023, analytical thinking, creative thinking, resilience, flexibility, curiosity, and lifelong learning are among the fastest-growing workplace skills globally. (World Economic Forum)

Design Thinking directly develops these capabilities.

5. Design Thinking as a Cognitive Framework

Design Thinking is not merely a workflow.

It is a cognitive operating system for navigating uncertainty and complexity.

It combines:

- Empathy
- Logic
- Creativity
- Visualization
- Experimentation
- Reflection
- Collaboration

The methodology teaches students to:

- Frame problems correctly
- Understand users deeply
- Navigate ambiguity
- Generate multiple possibilities
- Prototype rapidly
- Learn through iteration
- Integrate diverse perspectives

These are precisely the skills required in:

- Entrepreneurship
- Advanced manufacturing
- Product innovation
- Healthcare
- AI systems
- Sustainability
- Space technologies
- Public systems design

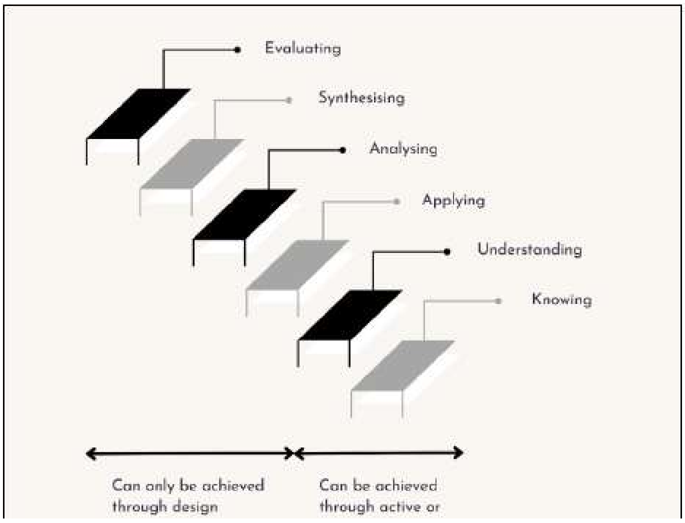
5.1 Introducing Design Thinking in India

One could argue that approaches to teaching and learning may vary from student to student, or from teacher to teacher, but this white paper intends to highlight the point that traditional methods of education are not sufficient or sustainable.

Knowledge - Traditional Education	Skills - Design Thinking
Students learn: ● Facts ● Principles ● Concepts ● Formulas	Students are able to transfer skills to other topics and disciplines: ● Analyse and Predict ● Compare and Contrast ● Write persuasively ● Research and Translate

How Design Education Can Transform India

Moving away from traditional education to Design Education can impact learners and industries to help transform India from a knowledge-consuming economy to a knowledge-creating and innovation-driven society.



Design Thinking through the lens of six facets		
Empathise	**Define**	**Ideate**
 Design starts with people. Who are we designing for? What do they feel, need, struggle with, or value? ● Observe ● Listen ● Interview ● Relate ● Imagine experiences ● Build understanding	 Insights become meaningful when patterns are identified clearly. What is the real problem? What challenge needs solving? ● Analyse ● Synthesize ● Frame the problem ● Identify needs ● Clarify constraints ● Prioritise opportunities	 Insights become meaningful when patterns are identified clearly. What is the real problem? What challenge needs solving? ● Analyse ● Synthesize ● Frame the problem ● Identify needs ● Clarify constraints ● Prioritise opportunities

Prototype	Reflect	Collaborate
 Ideas become clearer when made tangible. How can we test this concept quickly and visibly? ● Build ● Sketch ● Model ● Experiment ● Visualise ● Create iterations	 Design thinking is iterative learning. What did we discover? How has our understanding changed? ● Self-assess ● Recognise insights ● Reconsider decisions ● Learn from failure ● Document growth ● Refine process	 Better solutions emerge through shared perspectives. How can diverse viewpoints strengthen the outcome? ● Co-create ● Discuss ● Compare ideas ● Build together ● Challenge constructively ● Align understanding

Design Thinking plays a pivotal role in a large scale transformation:

- Economic and Educational Impact
- Boost in innovation-driven startups
- Better product and service design
- Increased global competitiveness
- Shift from rote learning to experiential learning
- Development of critical thinking and creativity
- Increased student engagement
- Social and Industry Impact
- Human-centered solutions for societal challenges
- Sustainable and inclusive design practices
- Empowerment of young creators and thinkers
- Workforce with practical, problem-solving skills
- Reduced skill gap between academia and industry
- Stronger innovation ecosystems

6. Quotient Integration: Beyond IQ-Centric Education

Traditional educational systems disproportionately reward IQ-based performance. However, innovation ecosystems require the integration of multiple intelligences. Design education naturally develops:

Quotient	Inherent Aptitude	The Design Education "Balance"
IQ (Intelligence)	Logic, Math, Rote Memory	Transforms abstract logic into **Applied Engineering.**
EQ (Emotional)	Empathy, Social Cues	Bridges the gap between "technical specs" and **"Human Needs."**
CQ (Curiosity/Creative)	Imagination, Play	Channels "daydreaming" into **Structured Ideation** and problem-solving.
AQ (Adaptability)	Resilience, Grit	Teaches that a "failed" prototype is data, not a dead-end, building **Professional Resilience**.

Overcoming Inherent "Lopsidedness"

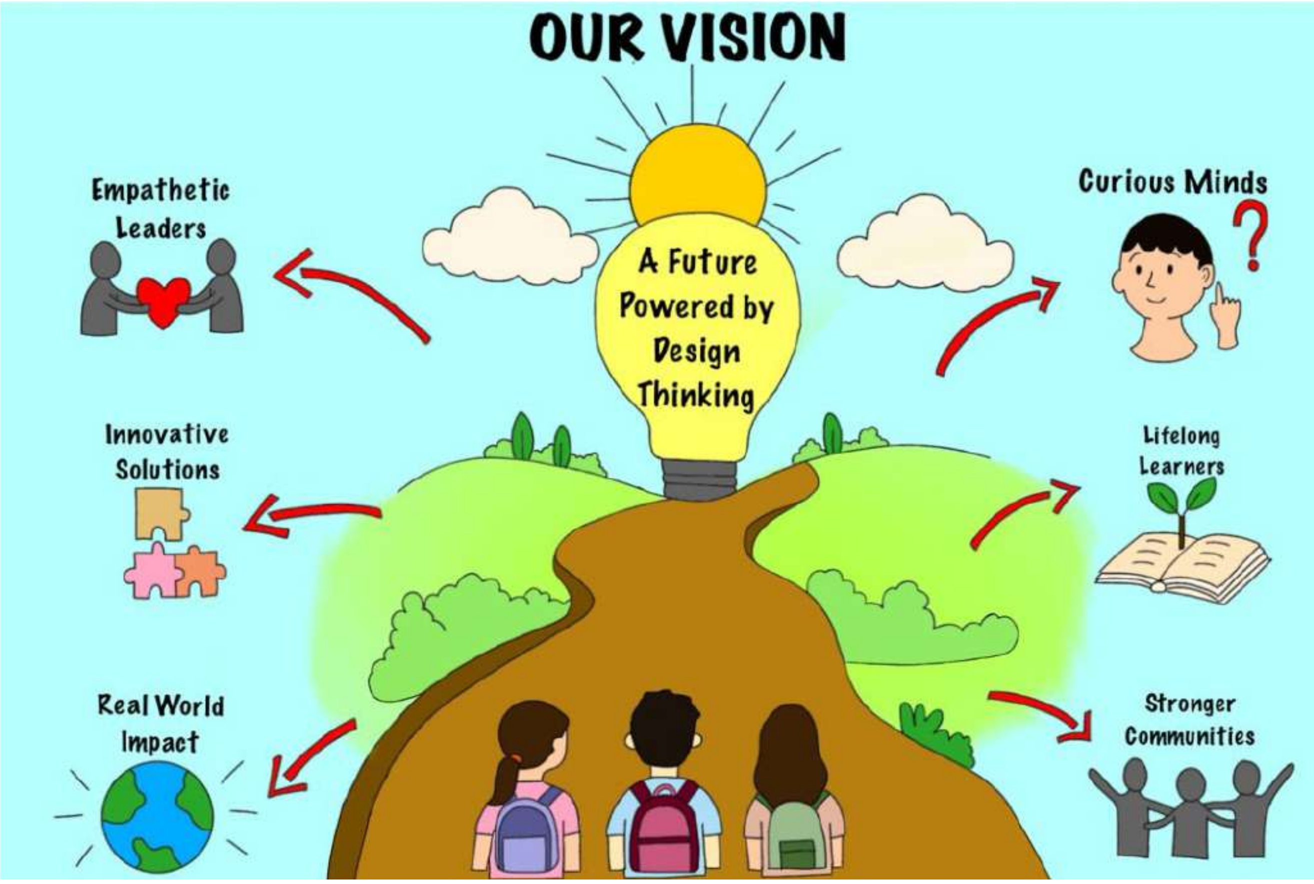
From a psychometric perspective, all students have inherent aptitudes which make them excel at certain quotients while struggling with others. Such an approach to learning will help students improve their abilities with lower aptitudes and hone their higher aptitudes, resulting in self-confidence, preparedness and vision when taking on new challenges.

Students are often born with a high "Naturalist" or "Logical" aptitude for example but may lack "Spatial" or "Interpersonal" skills. Design education forces a multimodal approach:

- A "Logical-Mathematical" student is pushed to develop EQ through user interviews.
- A "Visual-Spatial" student is pushed to develop IQ through structural feasibility and data optimization.

This creates "T-shaped learners":

- deep expertise in one area,
- broad collaborative capability across disciplines.



7. Challenges of Design Career Guidance in India

The absence of a reliable, regulated career guidance infrastructure in India acts as a significant barrier for students whose natural cognitive strengths make them well-suited for Design Thinking. Because Design Thinking is an interdisciplinary approach it often doesn't fit into the narrow "Science-Commerce-Arts" silos that traditional, unregulated guidance tends to reinforce.

The Peril of Unregulated Advice for Creative Problem-Solvers

The career counselling industry in India remains largely unregulated. With anyone being able to proclaim themselves as a career counselor.

This leads to a wide range in the quality of advice being given. Whereas, there are those in the industry following research based frameworks - currently, there is no incentive for anyone to shift to a scientific approach in career guidance.

SN Mentoring Consultancy Services (SNMCS) is one such example of a career guidance company following copyrighted models of guidance created by founder, Mr. Saurabh Nanda. As an example, the copyrighted career decision making model - Spheres of Understanding© helps organize information into a clear structure. SNMCS has also launched their own training program for career counselors in partnership with Map My Career Pvt Ltd - Career Mentors' Training Program (CMTP) in an effort to create high standards in the industry.

This creates a significant challenge in scaling, as India runs the risk of creating additional career counselors without any quality checks.

Cultural Misalignment in Aptitude Testing

Most psychometric tools used in India are imported from Western contexts. This creates a "translation error" for the Indian student who might excel in the collaborative, community-focused, and resourceful problem-solving that is central to Design Thinking.

- Inaccurate Mapping of "Design Mindset": Because these Western-validated tests don't account for Indian cultural nuances and educational backgrounds, a student's inherent talent for Empathy (the first stage of Design Thinking) or Iterative Prototyping might be mislabeled or overlooked entirely.
- Flawed Results, Stifled Potential: When a student receives an inaccurate profile, they are steered away from design-heavy fields. They end up in careers that don't utilize their natural strengths, leading to lower productivity and professional dissatisfaction.

Map My Career, founded by renowned psychometrician Dr. Itishree Mishra is one of the very few companies that offer psychometric tests that are validated on Indian student populations.

Accurate career guidance can lead to job and therefore life satisfaction. In practical terms, it leads to reduced turnover rates and higher productivity as the right aptitudes and mindset is matched with the right career paths. While India is in dire need of scaling the number of career counselors it needs, scaling without addressing the underlying issues will lead to creation of many more challenges.

7.1 Psychometric Assessments for Identifying Design Aptitudes

There is an increasing need to identify and nurture design talent at an early stage. While academic performance often measures knowledge acquisition, success in design disciplines depends upon a unique combination of cognitive abilities, perceptual skills, creativity, and problem-solving capabilities. Psychometric assessments provide a scientific and standardized approach to identifying these underlying aptitudes.

Design is fundamentally a human-centred discipline that combines creativity with functionality. Effective designers are required to visualize concepts, understand form and structure, solve practical problems, remember and manipulate visual information, and often work with mechanical and technological systems. Well-designed psychometric assessments can help identify these capabilities long before a student develops a formal portfolio or receives professional training.

Visual Aptitude

Visual aptitude refers to an individual's ability to perceive, interpret, and manipulate visual information. It encompasses skills such as pattern recognition, colour sensitivity, shape perception, visual discrimination, and aesthetic judgment.

Students with strong visual aptitude are often able to:

- Detect subtle differences in shapes, patterns, and forms.
- Recognize visual relationships and compositions.
- Understand balance, symmetry, and proportion.
- Communicate ideas effectively through sketches, diagrams, and visual representations.

Visual aptitude forms the foundation for disciplines such as graphic design, communication design, animation, UI/UX design, fashion design, and visual arts. Psychometric assessments can objectively evaluate these capabilities through pattern analysis, visual reasoning tasks, and perceptual exercises.

Spatial Aptitude

Spatial aptitude represents the ability to mentally visualize, rotate, transform, and manipulate objects in two-dimensional and three-dimensional space. It is one of the strongest predictors of success in many design and engineering-related fields.

Individuals with high spatial aptitude can:

- Imagine how objects appear from different perspectives.
- Visualize structures before they are physically created.
- Understand dimensions, scale, and proportions.
- Interpret technical drawings, layouts, and blueprints.

This aptitude is particularly important in industrial design, architecture, product design, interior design, transportation design, urban planning, and engineering design. Spatial reasoning assessments often involve mental rotation exercises, 3D visualization tasks, and spatial relationship problems that provide insight into a student's design potential.

Visual Memory and Design Memory

Designers frequently rely on their ability to store, retrieve, and utilize visual information. Visual memory refers to the capacity to remember images, patterns, forms, colours, and spatial arrangements after exposure.

Strong visual memory enables students to:

- Recall design references and inspirations.
- Retain complex visual details.
- Recognize recurring patterns and motifs.
- Build visual libraries that support creative ideation.

Research in creativity and design cognition suggests that many successful designers draw upon extensive mental repositories of visual experiences, enabling them to combine existing concepts into novel solutions. Psychometric assessments measuring visual memory can therefore provide valuable indicators of a student's potential for creative design work.

Mechanical Aptitude

Mechanical aptitude refers to the ability to understand how physical systems, tools, structures, and mechanisms function. While often associated with engineering, it is equally relevant to many branches of design that involve products, materials, manufacturing processes, and user interaction with physical objects. It is also the aptitude which defines hand-eye coordination capabilities.

Students with strong mechanical aptitude typically demonstrate:

- Understanding of cause-and-effect relationships in mechanical systems.
- Interest in how products function internally.
- Ability to visualize moving components and mechanisms.
- Practical problem-solving involving materials and structures.
- Ability to learn motor and fine motor skills of hands and limbs.

Mechanical aptitude is particularly valuable in industrial design, product design, automotive design, robotics design, interaction design, and innovation-driven entrepreneurship.

Assessments may evaluate understanding of gears, levers, forces, motion, and functional systems, providing insight into a student's capacity for design innovation.

But also, it allows students to learn how to develop their design thinking by learning to develop skills in drawing, sketching, sculpting among other skills. Students can be guided to use more software based skills if mechanical aptitude is low.

Beyond Individual Aptitudes: Building a Holistic Design Profile

The most effective psychometric systems do not evaluate these abilities in isolation. Instead, they combine multiple measures to create a comprehensive design aptitude profile. Such profiles may include:

- Visual and spatial reasoning.
- Creative thinking and originality.
- Mechanical understanding.
- Observation skills.
- Problem-solving orientation.
- Curiosity and innovation potential.
- Personality traits relevant to design, such as openness to experience and tolerance for ambiguity.

This holistic approach allows educators and career counsellors to identify not only students who may excel in traditional design disciplines but also those who possess untapped innovation potential that can be nurtured through appropriate educational pathways. Career counsellors can easily help students learn how to use their natural design aptitudes in learning other subjects such as Math, Sciences, Finance, Logic and Humanities.

Implications for Design Education in India

Integrating psychometric assessments into school and higher education systems can democratize access to design education by moving beyond subjective judgments and portfolio-based selection alone. Students from diverse backgrounds, including those with limited exposure to formal design training, can be identified based on their inherent capabilities and potential.

For institutions, psychometric assessments can support informed admissions decisions, personalized learning pathways, and targeted interventions. For students and parents, they provide greater clarity regarding strengths, career alignment, and future opportunities within the rapidly expanding design and innovation ecosystem.

As India aims to become a global leader in innovation, manufacturing, technology, and creative industries, psychometric assessments can serve as an important bridge between talent identification and talent development, ensuring that the nation's future designers are discovered, nurtured, and empowered to contribute meaningfully to economic and social transformation.

7.2 Career Decision Making around Design

In India, where students often make academic and career decisions at critical transition points such as Class 10, Class 12, and undergraduate admissions, unstructured career guidance can lead to significant long-term consequences.

Without access to systematic, evidence-based counselling, many young people rely on limited information from family members, peers, social media, coaching institutes, or prevailing societal perceptions of "successful" careers. This frequently results in career choices that are misaligned with an individual's interests, aptitudes, and emerging industry opportunities. The consequences include poor academic engagement, higher rates of course switching and dropouts, underemployment, skill mismatches, reduced workforce productivity, and dissatisfaction in professional life.

At a national level, unstructured guidance also contributes to talent concentration in a narrow set of traditional professions while high-growth sectors struggle to attract qualified candidates, thereby undermining the objectives of the National Education Policy (NEP) 2020 and India's aspirations to build a future-ready, innovation-driven workforce. Structured career guidance is therefore essential not only for individual success but also for optimizing the country's human capital and economic development.

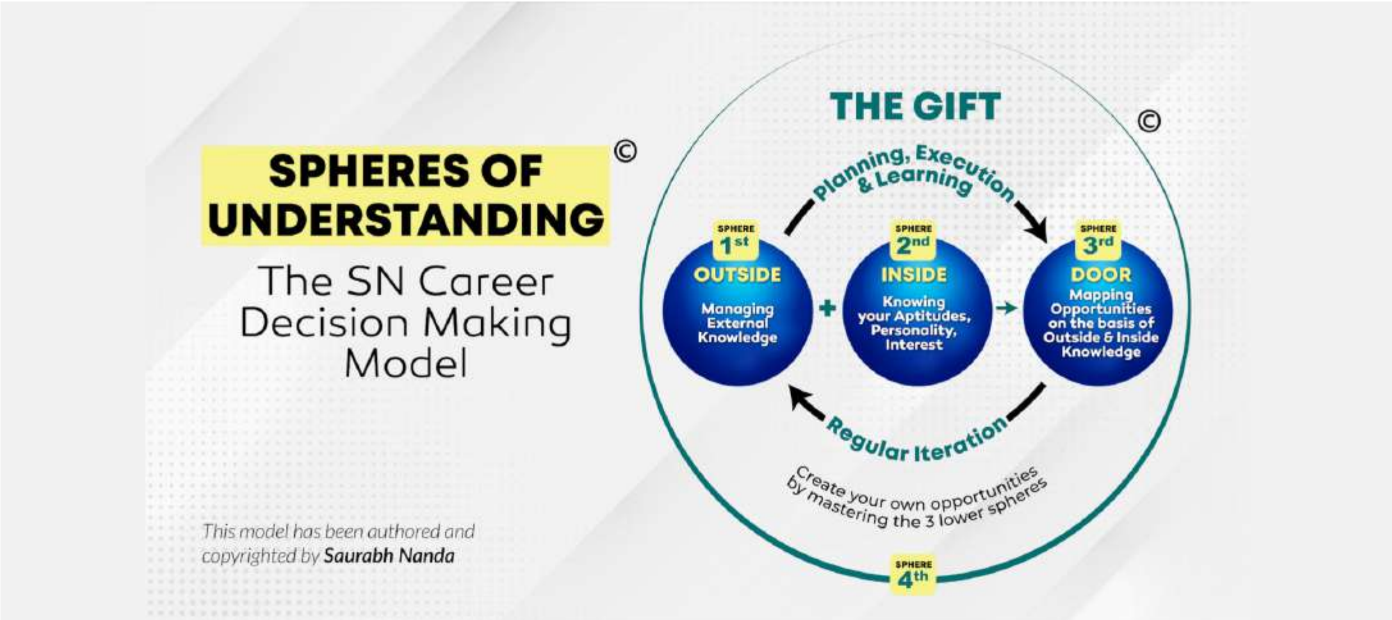
A Standardized Approach to Career Guidance & Mentorship

With a large volume of young Indians entering higher education and subsequently the workforce every year, an evidence based, result-oriented framework for Career Counselling can transform this transition into India's biggest advantage on the world stage.

The SN Career Decision Making Model

Saurabh Nanda (CEO & Founder of SN Mentoring) has developed various models of career decision making through years of guiding young students. Over time, the models were refined to the point of becoming a reliable guidance and mentorship structure. These have been copyrighted in India and the U.S.A. and are used extensively for SN Mentoring's services as well as taught in his career counsellor training program - Career Mentors Training Program (CMTP).

Spheres of Understanding©

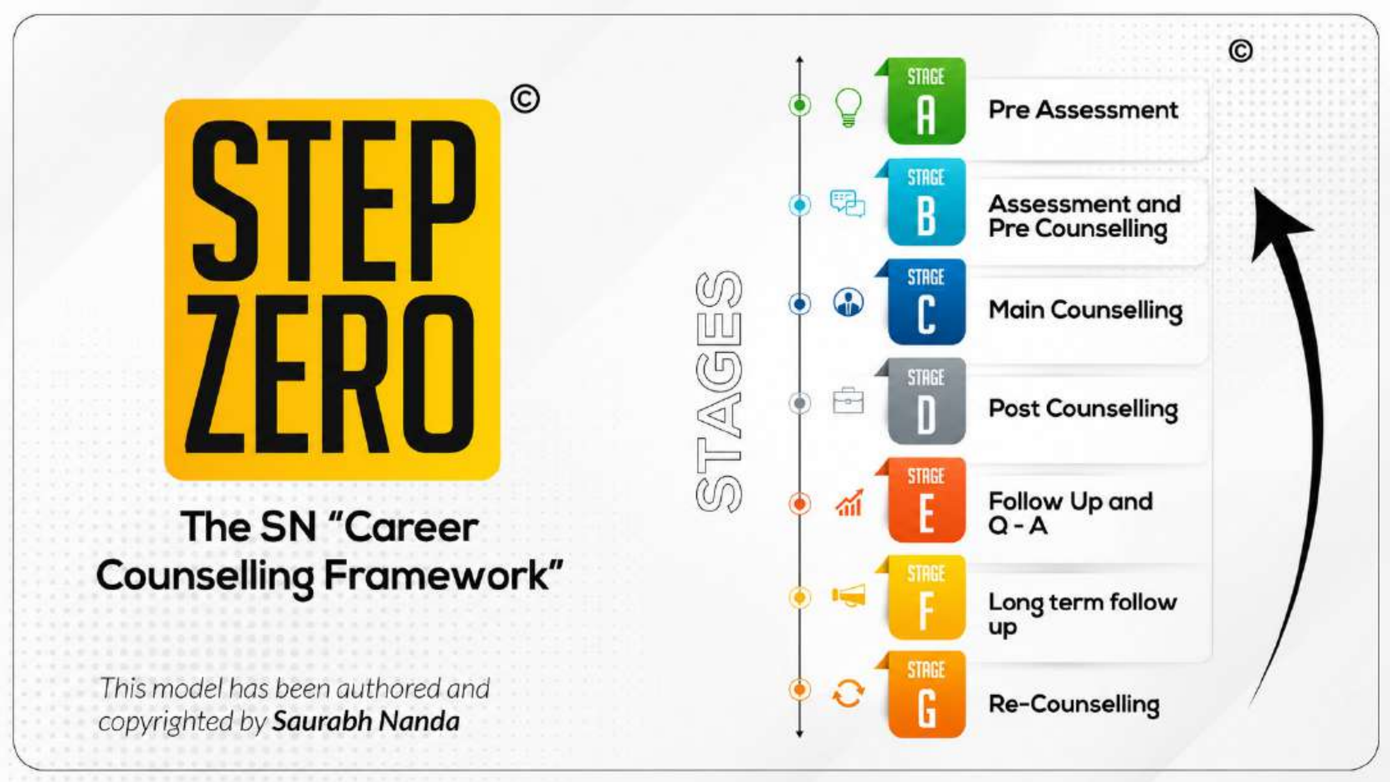


The Spheres of Understanding© career decision making model can play a valuable role in identifying students with design-related aptitudes and guiding them toward careers where these strengths can flourish. Within the framework, the;

1. **Outside Sphere** helps students navigate the vast and often confusing landscape of design disciplines, educational pathways, and emerging career opportunities by distinguishing between marketing-driven narratives, subjective opinions, and credible information.
2. **Inside Sphere** enables a deeper understanding of the student through psychometric assessments and self-reflection, helping uncover traits commonly associated with design potential such as creativity, problem-solving ability, visual-spatial reasoning, empathy, innovation, systems thinking, and user-centric thinking. Once a student's strengths and motivations are clearly understood.
3. **The Door** allows these capabilities to be mapped to relevant opportunities across fields such as product design, UX/UI design, architecture, engineering design, service design, social innovation, entrepreneurship, and design-led research.
4. **The Gift** empowers students to move beyond participating in existing opportunities and become creators of new solutions, ventures, products, and systems, leveraging Design Thinking to address complex societal and economic challenges.

In this way, the framework not only helps identify design talent but also supports its progression into meaningful educational pathways, careers, and future leadership roles.

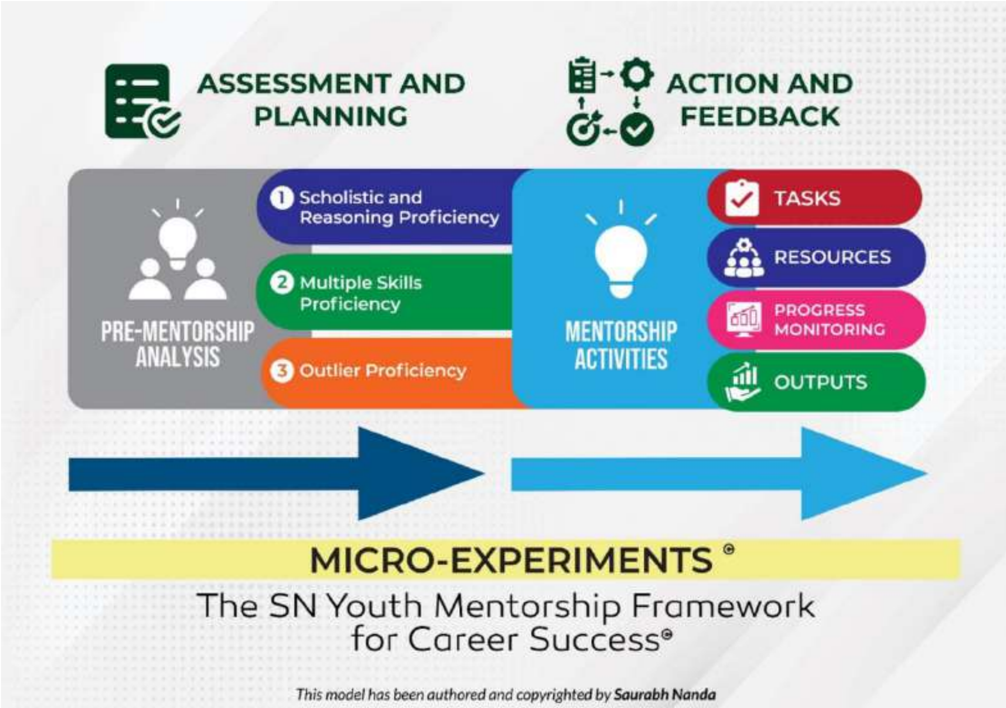
Step Zero©



Traditional career counselling often focuses on academic performance, subject choices, and stated aspirations when recommending career pathways. While valuable, this approach can overlook aptitudes such as creativity, innovation, problem-solving, systems thinking, and human-centered design, leaving many students with strong design potential unidentified. The Step Zero© Career Counselling Framework addresses this through a structured process that develops a deeper understanding of each student.

- **Pre-Assessment:** Students are introduced to the process and prepared for a journey of self-discovery.
- **Assessment & Pre-Counselling:** Psychometric assessments based on the A-P-I (Aptitude, Personality, and Interests) model, combined with an exploration of the student's achievements, experiences, and interests, help identify indicators of design potential such as creativity, empathy, visual-spatial reasoning, innovation, critical thinking, and problem-solving.
- **Main Counselling:** Insights are shared with the student to explore educational pathways and careers where design-related strengths can create value, while encouraging reflection and validation.
- **Post-Counselling, Follow-Up, and Long-Term Follow-Up:** Ongoing guidance helps students explore opportunities, refine interests, and make informed academic and career decisions.
- **Re-Counselling:** Students can reassess their situation as they gain new experiences and insights. This allows an objective review of the counselling and experiences gained.

Micro-Experiments©



The Micro-Experiments© Mentorship Framework is designed to identify and nurture students with curiosity, aptitude, or potential in design-related fields. Built on the principle that meaningful learning occurs through experience, the framework helps learners validate their interests through structured, progressively challenging activities that develop creativity, problem-solving, innovation, systems thinking, empathy, and real-world application.

As described in the Spheres of Understanding© career decision-making model, informed career decisions require a strong understanding of the self. While the Step Zero© Career Counselling Framework identifies aptitudes, personality traits, and interests, Micro-Experiments© provides the practical exposure needed to test and validate design-related potential through guided experimentation, reflection, and mentorship.

A. Assessment and Planning Stage

The mentorship journey begins with an assessment informed by the Step Zero© Framework, identifying design potential and creating individualized learning plans across three proficiency tracks:

- **Design Reasoning & Problem-Solving** Proficient
  Critical thinking, problem identification, solution generation, pattern recognition, and application of design methodologies.
- **Creative & Technical Skills Proficiency**
  Development of skills such as visual communication, prototyping, digital design, research, collaboration, storytelling, and presentation.
- **Innovation & Outlier Proficiency**
  Original thinking, experimentation, entrepreneurship, leadership, systems thinking, and the creation of novel solutions.

Based on these insights, a personalized mentorship plan is developed.

B. Action and Feedback Stage

Learners engage in structured micro-experiments while receiving ongoing mentorship, feedback, and support through:

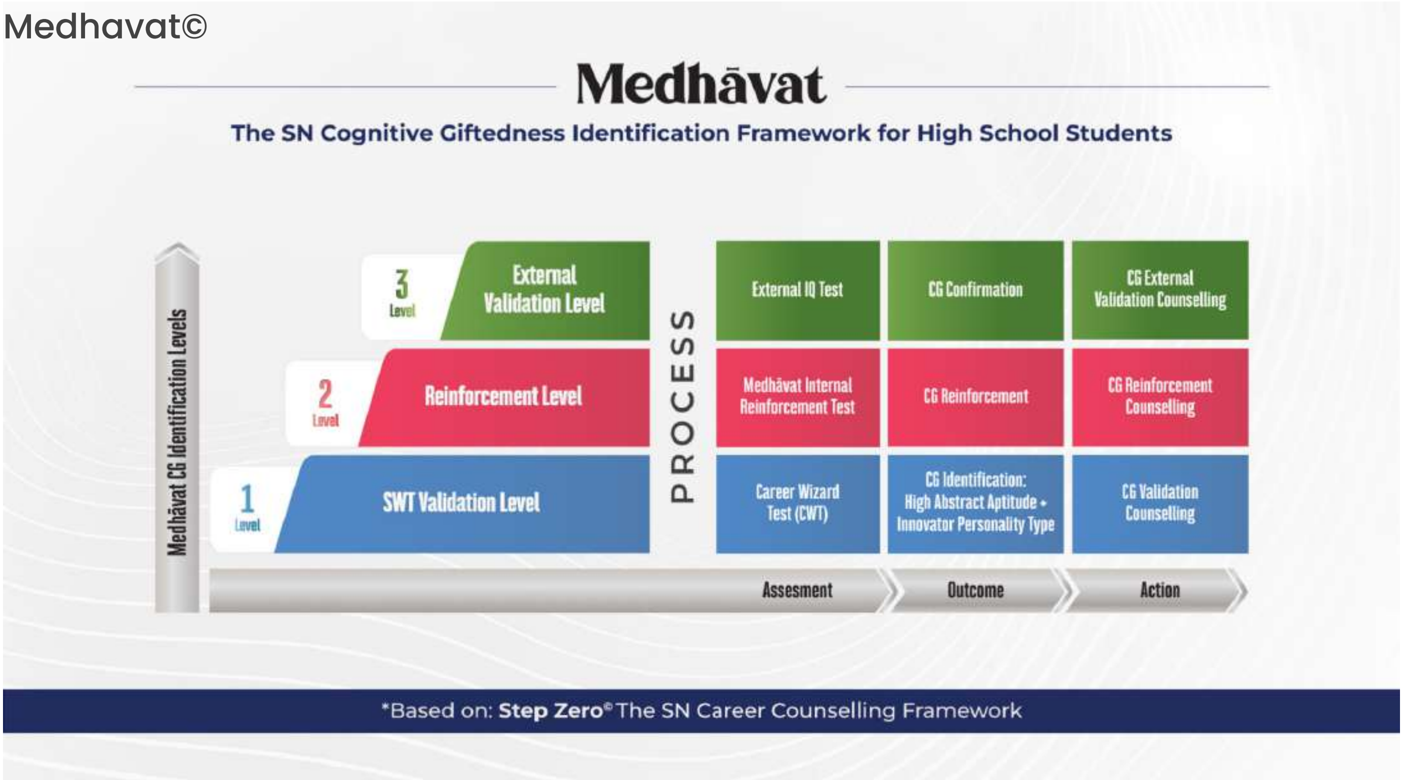
- Design-related tasks and challenges
- Curated learning resources and opportunities
- Progress monitoring and reflective feedback
- Documentation of achievements and growth

Mentorship Activities

- Tasks Activities may include solving real-world design challenges, conducting user research, creating prototypes, participating in competitions and innovation challenges, exploring design disciplines, and presenting solutions to mentors and peers.
- Resources Learners gain access to relevant books, courses, software tools, maker spaces, innovation programs, industry mentors, internships, apprenticeships, and immersion opportunities.
- Progress Monitoring Regular reviews evaluate skill development and interest alignment. Mentors provide feedback, address challenges, and refine learning plans through an iterative process of testing, learning, and improvement.
- Outputs Learners build evidence of growth through portfolios, project documentation, websites, presentations, competition entries, innovation showcases, and records of prototypes and experiments.

Through guided micro-experiments, learners can determine whether design is simply an interest or a genuine strength. The framework helps identify and develop future designers, innovators, entrepreneurs, researchers, and leaders capable of applying Design Thinking to solve complex real-world challenges.

Medhavat©



Research in gifted education shows that exceptional potential is often associated with creativity, systems thinking, curiosity, pattern recognition, and advanced problem-solving—traits closely linked to Design Thinking. While these indicators may emerge early, they become more reliable during adolescence as cognitive, personality, and interest profiles stabilize.

Building on these insights, SN Mentoring focuses on identifying students with exceptional Design Thinking potential after the age of 14.

Using the Career Wizard Test for students aged 14 to 20, the Medhāvat© Framework provides a structured, research-backed methodology for identifying learners with exceptional capabilities in innovation, creativity, problem-solving, and design-led leadership.

The term Medhāvat refers to a person endowed with exceptional intellect.

Within the context of Design Thinking, the Medhāvat© Framework identifies learners whose cognitive profiles indicate the potential to become future innovators, designers, entrepreneurs, systems thinkers, and creators of transformative solutions. The framework is grounded in the Step Zero© Career Counselling Framework, which systematically identifies aptitudes, interests, and cognitive capabilities associated with Design Thinking potential.

The framework consists of three incremental levels, each following the A-O-A (Assessment–Outcome–Action) model:

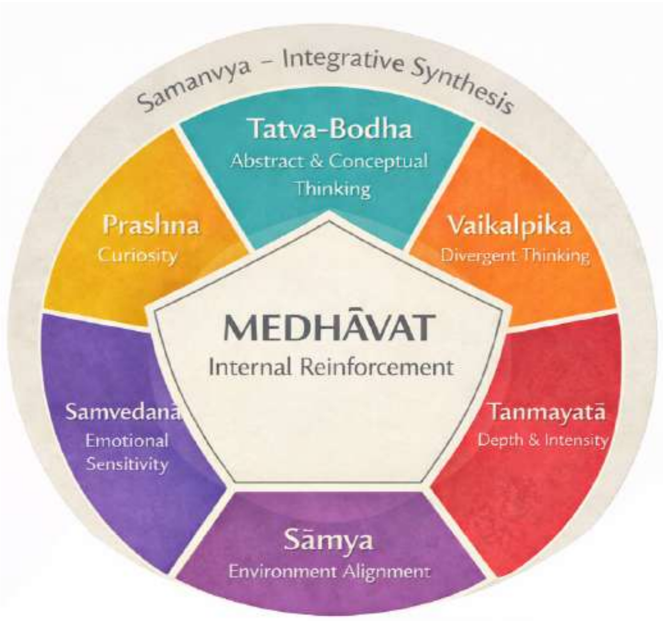
Level 1 – Design Thinking Potential Identification

The Career Wizard Test evaluates aptitude, personality, and interests to identify indicators such as creativity, curiosity, systems thinking, problem-solving, empathy, visual-spatial reasoning, adaptability, and entrepreneurial inclination. Students demonstrating strong patterns proceed for further exploration.

- Career Wizard Test (Assessment)
- Design Thinking Potential Identification (Outcome)
- Design Thinking Validation Counselling (Action)

Level 2 – Design Thinking Reinforcement

Students identified in Level 1 undertake the Medhāvat© Internal Reinforcement Assessment, which examines dimensions such as divergent thinking, abstraction, user-centric thinking, systems awareness, interdisciplinary reasoning,



experimentation, and creativity under constraints. This stage strengthens identification reliability and deepens understanding of the student's innovation potential.

- Medhāvat© Internal Reinforcement Assessment (Assessment)
- Design Thinking Reinforcement (Outcome)
- Design Thinking Reinforcement Counselling (Action)

Level 3 – Advanced Design Potential Validation

An external evaluation is recommended to independently validate advanced cognitive and creative capabilities through recognized assessments, portfolio reviews, innovation challenges, or design problem-solving exercises. This provides objective evidence for future educational and mentorship planning.

- External Validation Assessment (Assessment)
- Advanced Design Thinking Potential Confirmation (Outcome)
- Design Talent Development Counselling (Action)

By combining psychometric assessment, reinforcement analysis, and independent validation, the Medhāvat© Framework provides a robust approach to identifying students with exceptional Design Thinking potential. The framework helps uncover and nurture future innovators, designers, entrepreneurs, researchers, and problem-solvers capable of addressing complex societal, technological, and economic challenges.

8. K–12 Transformation Through Design Thinking

The integration of Design Thinking into K–12 education has the potential to fundamentally transform learning culture.

Key Pedagogical Shifts

From Memorization → Inquiry

Students learn to ask meaningful questions rather than merely reproduce answers.

From Passive Learning → Active Learning

Learning becomes experiential and project-based.

From Subjects → Systems

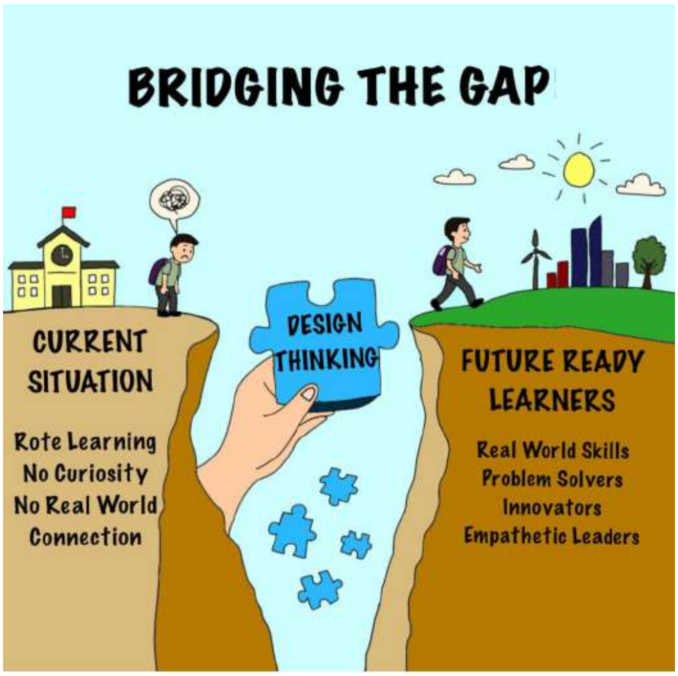
Students begin understanding the interconnectedness of science, design, society, economics, and sustainability.

From Fear of Failure → Iterative Learning

Failure becomes part of experimentation rather than a source of punishment.

8.1 K-12 Education: What can be taught

Learning at the K-12 level should be designed to be experiential, playful, and inquiry-driven, and this can only be achieved if the focus is on exploration, curiosity and foundational thinking skills. Following are itemized learning areas that can be incorporated at the school curriculum level:



Key Learning Areas

i. **Basic design thinking**

- Foundation of design thinking.
- Introduction to design thinking.
- Core design thinking principles.
- Design thinking essentials.
- Foundation of creative problem solving.

ii. Understanding problems through observation

- Insight through observation.
- Observational analysis.
- Empathy-led understanding.
- Contextual problem discovery.
- User-centric insight building.

iii. Brainstorming multiple solutions

- Divergent ideation.
- Expansive idea generation.
- Multi-solution exploration.
- Creative concept development.
- Ideation sprint.

iv. Creating simple prototypes

- Rapid prototyping.
- Concept prototyping.

- Early-stage model making.
- Idea to form development.
- Prototype iteration.

v. Hands-on model building

- Experiential model making.
- Applied 3D construction.
- Practical form development.
- Tactile model exploration.
- Physical prototype practice.

vi. 3D structure modelling such as LEGO-based structures (stadiums, cities)

- 3D structural modelling (Modular builds-stadia, urban layouts).
- Spatial construction using modular systems.
- Architectural from building through LEGO-based models.
- Urban and structural modelling with modular components.
- Scaled environment construction.

vii. Introduction to mechanical movement and structures

- Fundamentals of mechanical systems.
- Basics of movement and structural design.
- Introduction to kinetic structures.
- Principles of motion in design.
- Mechanical thinking in form and function.

viii. Sustainability awareness

- Foundation of sustainability thinking.
- Environmental consciousness in design.
- Sustainability literacy.
- Responsible design awareness.
- Eco-centric thinking.

ix. Aligning to SDG goals such as water management systems, energy conservation models, etc

- SDG-aligned design application.
- Designing with global sustainability.
- Applied sustainability projects.
- Real-world problem solving through sdg integration.
- Sustainable system design.

x. Spatial and visual thinking

- Spatial intelligence and visualisation.
- Visual and spatial reasoning.
- Spatial awareness in design.
- Visual thinking and form exploration.
- Perceptual and spatial understanding.

xi. Sketching and visualization

- Concept sketching and visualisation.
- Idea mapping through sketching.
- Visual representation techniques.
- Expressive sketch development.
- Translation ideas to visual form.

xii. Introduction to 3D thinking

- Foundation of three dimensional thinking.
- Introduction to spatial form development.
- Understanding form in three dimensions.
- 3D conceptualisation basics.
- Thinking in volume and depth.

xiii. Modular structural building

- Modular construction techniques.
- System based structural building.
- Component-led form assembly.
- Structural design through modules.
- Building with a repetitive system.

xiv. Basic engineering design concepts

- Engineering basics for design.
- Balance, forces and structural stability.
- Simple machine and mechanisms.

xv. Creative problem solving

- Applied creative thinking.
- Design-led problem solving.
- Innovation through problem solving.
- Strategic creative solutions.
- Solution oriented thinking.

xvi. Real-life challenges (dog park, eco-home, small city models)

- Real world design challenges. (public spaces, sustainable homes, urban models)
- Applied project everyday problem solving through design.
- Context based design scenarios. (community and environment)
- Practical design challenge. (built environment and sustainability)
- Design for real life context. (spaces, systems and communities)

Through this integration, we want students to see themselves as creators, rather than just learners. This stage will help students develop curiosity, creativity and confidence.

8.2 Enabling Schools to Build Future-Ready Student Profiles

With the incorporation of We-Learn's design thinking modules into the education pipeline, there will be a transformative effect for Indian students. It will create a powerful supplementary profile enhancement for students in Indian board schools, where the pressure of performing well in academics often leaves learners under a lot of pressure and results in a lack of any actual interest in learning.

Our programs will equip students with critical 21st-century skills, such as research, problem-solving, creative thinking, and visual communication, through real-world projects that go beyond textbook knowledge.

There is a limited space for applied, interdisciplinary learning in schools; our modules complement the existing curriculum by introducing meaningful qualities, such as experiential learning, innovation, and independent thinking, enabling students to demonstrate initiative, depth, and originality, all of which are increasingly valued in higher education and future careers.

Additionally, the training of teachers to adopt the proposed learning modules will enable them to add immense variety in how they measure learning outcomes as well as their methodologies of teaching. Enabling them to impart knowledge and concepts of existing curriculum through practical project-work.

9. Teaching & Learning Frameworks: ATL & ATT

ATT (Approaches to Teaching) focuses on how educators deliver learning experiences. ATT ensures that teaching is student-centered rather than content-centered.

- Thinking Skills: critical thinking, creativity, and transfer of learning.
- Communication Skills: exchanging information, reading, writing, and presenting.
- Social Skills: Collaboration, teamwork, and emotional intelligence.
- Self-Management Skills: organization, time management, and resilience.
- Research Skills: Information literacy, media literacy, and ethical research.

ATL (Approaches to Learning) focuses on how students learn and develop essential skills. ATL encourages students to learn how to learn, making them adaptable and independent thinkers.

- Based on Inquiry: Encouraging student questioning and exploration.
- Focused on Concept Understanding: Exploring principles that transfer across disciplines.
- Developed in Contextual Settings: Making learning local and global.
- Focused on Teamwork and Collaboration: Promoting peer learning.
- Differentiated to Meet Learner Needs: Supporting diverse learning styles.
- Based on Effective Assessment: Using feedback to improve learning.

Combining both ATT and ATL combines a holistic learning approach:

- Teachers facilitate rather than instruct
- Students actively engage rather than passively receive
- Learning becomes contextual and application-based

The VARK model talks about different learning styles and Design Education naturally integrates all 4 together:

V - **Visual:** Diagrams, sketches, mind maps

A - **Auditory:** Discussions, storytelling, explanations

R - **Reading/Writing:** Notes, reflections, documentation

K - **Kinesthetic:** Hands-on activities, prototyping

Prerequisites For The Teaching Goals

In order to achieve meaningful learning, teaching should include fostering open-ended, thought provoking and intellectually engaging environments that promote not just discussion, but also debate. Emphasis should be placed on developing thinking skills and encouraging sharing ideas through a multidisciplinary and inquiry based approach and nurturing the ability to understand multiple perspectives. It is equally essential to cultivate questioning habits to allow strong knowledge to fester naturally.

10. Undergraduate Education and Innovation Readiness

At the undergraduate level, Design Thinking must evolve into Design Engineering and innovation systems development.

Students should engage with:

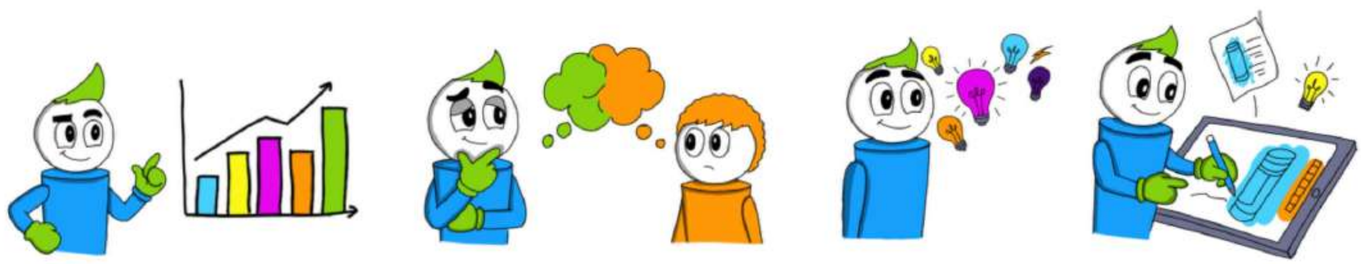
- CAD and simulation tools
- Systems engineering
- Human-centered research
- Product architecture
- Sustainable design
- Entrepreneurship
- Commercialization frameworks
- Intellectual property systems

This transforms universities from: "Knowledge Delivery Institutions" into "Innovation and Commercialization Ecosystems."

10.1 Design Engineering VS Design Thinking Profiles

Design engineering starts with design thinking that integrates IQ, EQ, CQ, and VQ to move from insight to impact, balancing logic, empathy, creativity, and visualisation.

Design thinking naturally brings together different forms of intelligence, making it a holistic problem-solving approach.



- IQ (Intellectual Intelligence) comes into play while analysing problems, identifying patterns, and structuring logical solutions. It helps in research, strategy, and decision-making.
- EQ (Emotional Intelligence) is central to empathy, the core of design thinking. Understanding user needs, emotions, and behaviours ensures solutions are human-centered and meaningful.
- CQ (Creative Intelligence) drives ideation. It allows individuals to think divergently, explore multiple possibilities, and generate original, unconventional solutions.
- VQ (Visual Intelligence) enables the translation of ideas into tangible forms - sketches, prototypes, layouts, and visual systems, making abstract thinking visible and testable.

When these intelligences develop together, a student is not just knowledgeable, but also self-aware, expressive, and innovative. This balance is what universities and future careers increasingly value, a profile that can think, feel, create, and communicate with equal strength.

10.2 From Undergraduate to Industry: What Needs to Be Taught

Learning should evolve from structured, application-based education at the undergraduate level to innovation-driven, leadership-oriented thinking in the industry. The progression builds from technical execution to strategic decision-making and impact.

Key Learning Areas

i. Design Thinking, Research & Problem Solving

- User research and insights
- Problem definition and framing
- Structured ideation methods
- Complex systems thinking and advanced problem solving

ii. Engineering & Systems Integration

- Mechanical, electrical, and digital systems
- Interdisciplinary project development
- Cross-functional collaboration

iii. Prototyping, Fabrication & Sustainable Systems

- 3D modelling and CAD tools
- Prototyping and fabrication techniques
- Lifecycle thinking
- Sustainable and circular design principles

iv. Data, Analysis & Optimization

- Performance evaluation
- Simulation and testing
- Cost, material, and performance optimization

v. Digital Tools & Technologies

- Advanced CAD/CAM tools
- Simulation and digital prototyping

vi. Business, Innovation & Strategy

- Product-market fit
- Branding and entrepreneurship
- Product development pipelines
- Research and development frameworks

vii. Leadership in Design

- Managing design teams
- Driving innovation culture

Students and professionals evolve from learning how to build structured, functional solutions to leading innovation, optimizing systems, and creating scalable, real-world impact across industries.

10.3 The Entrepreneurial Imperative: Design as a Business Strategy

For the modern entrepreneur, design is no longer "aesthetic", it is strategic risk management.

- De-risking through Empathy: Most startups fail because they build products no one wants. Design education teaches entrepreneurs to "learn fast" through rapid prototyping and deep user empathy, ensuring product-market fit before heavy capital investment.
- The Narrative Advantage: Entrepreneurs must be storytellers. Design education (Visual Intelligence) provides the tools to communicate complex visions to investors and customers through compelling visual and conceptual narratives.

Navigating Ambiguity: Business environments are increasingly "VUCA" (Volatile, Uncertain, Complex, Ambiguous). Design thinking provides a structured framework to stay productive even when the "right answer" isn't in a textbook.

11. Alignment with NEP 2020

The National Education Policy (NEP) 2020 already provides a strong foundation for Design Thinking integration.

NEP emphasizes:

- Experiential learning
- Multidisciplinary education
- Competency-based assessment
- Holistic development
- Flexibility in learning pathways
- Critical thinking
- Skill-based education

These principles align directly with Design Thinking frameworks. (The Times of India)

With the Indian education industry still adapting itself to conform to mandates laid out in the NEP 2020, we are ideally placed to transform the higher education landscape.

Some of the framework changes of NEP include:

- Preference to transform undergraduate degree programs to be 4-year in duration.
- Multidisciplinary degree requirement across sciences, arts, commerce, and vocational areas.
- Holistic curriculum components for all undergraduate degrees
- Focus on skill-building and employability
- Outcome-based learning modules (as opposed to rote learning)
- Practical assignment/project work

Design education is uniquely suited to fulfill all of the above mentioned requirements.

The successful implementation of NEP therefore requires pedagogical systems capable of operationalizing these goals. Design education provides that operational framework

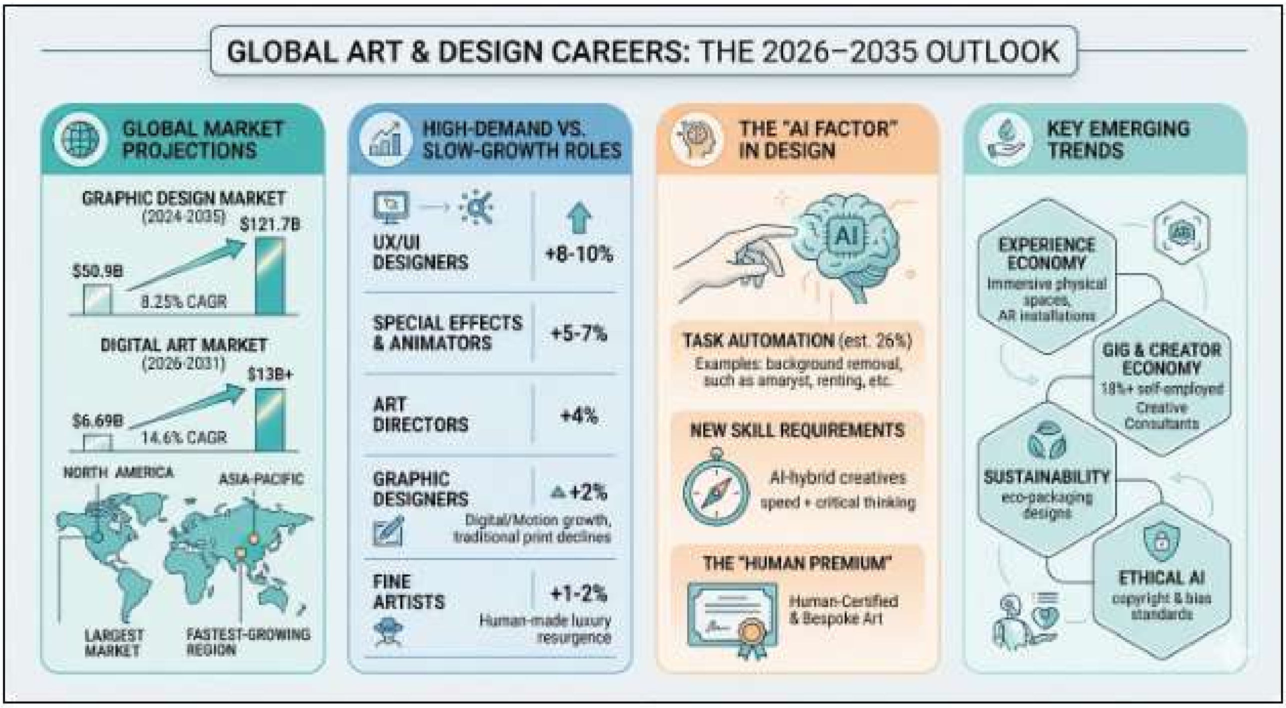
12. The Visual Literacy Revolution

As AI becomes the primary generator of text and code, Visual Literacy - the ability to interpret, negotiate, and make meaning from information presented in the form of an image becomes the ultimate human differentiator.

- The Experience Economy: In the next decade, value will shift from "buying a product" to "engaging in an experience." Design education is the primary training ground for creating these high-value experiences.
- AI Collaboration: Students who understand design principles will use AI as a "high-speed pencil," while those without design education will be replaced by the very tools they use as shortcuts.

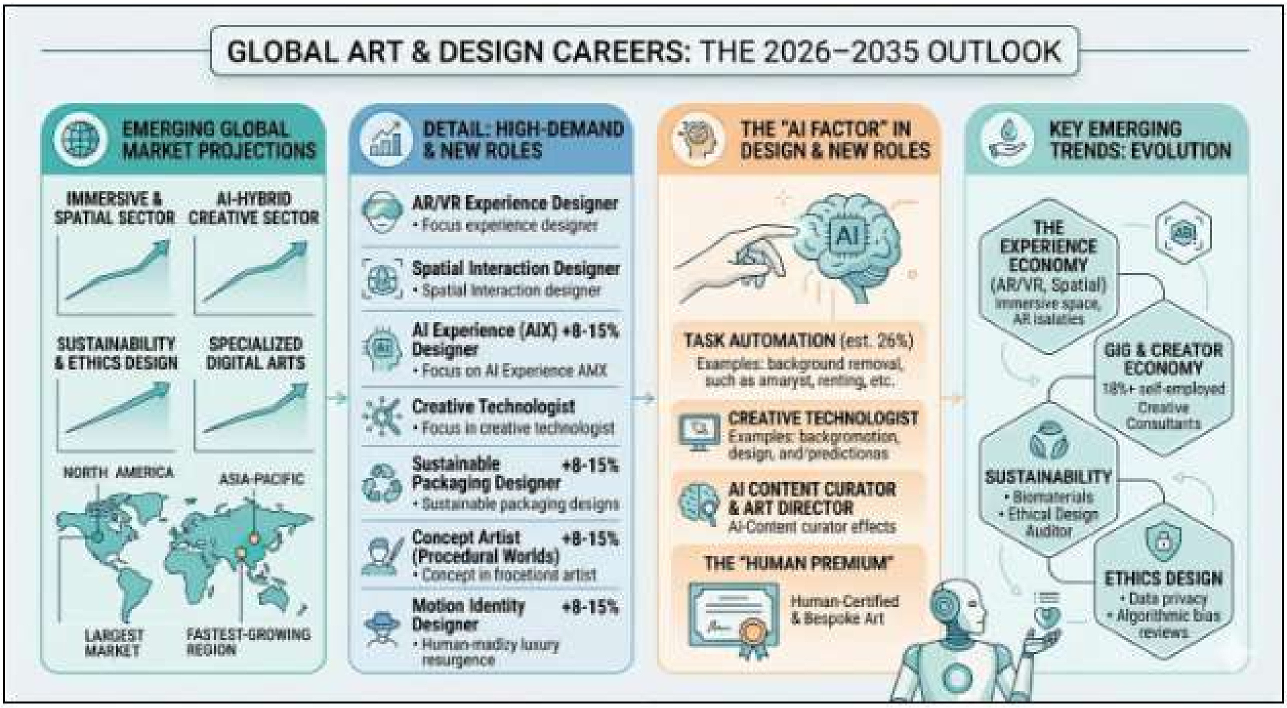
Final Note: The transition from a "Knowledge Economy" to an "Innovation Economy" is not a choice; it is a survival mandate. Design Education is the bridge between what India is and what India must become by 2047.

The Creative Evolution:
Global Art & Design Careers: The 2026-2035 Outlook



The Creative Evolution: Global Market Shifts, AI Integration, and the Rise of the Experience Economy (2026–2035)

The Visual Literacy Revolution:
Global Art & Design Careers: The 2026-2035 Outlook



The Visual Literacy Revolution: Redefining Career Success and Economic Value in a Visual-First World

13. Space Economy, Deep Tech, and the Future Workforce

India’s growing space ecosystem demonstrates why design capability matters.

According to IN-SPACE’s strategic roadmap, India aims to significantly expand its participation in the global space economy over the coming decade. (YouTube)

Future industries such as:

- space technologies,
- robotics,
- AI systems,
- autonomous mobility,
- climate engineering,
- biotech,
- defense systems, will require professionals capable of:
- systems integration,
- interdisciplinary thinking,
- visualization,
- rapid iteration,
- human-centered design.

These industries demand Design Thinking at their core.

Benefits of Design Education to prepare for Space Industry of 2040

The rapid interest and investment in the Space Industry has put it on track to reach a valuation of $4 trillion dollars by the year 2040. There is rising awareness of the need to adapt the Indian education system in order for young Indians to lead the space economy.

Integration of Design Education can enhance the capability of Indian students to thrive in space-related courses and careers.

13.1 Systems Thinking and Complexity Management

Space missions are “systems of systems.” A failure in a small sensor can compromise a multi-billion dollar mission. Design education teaches students to map interdependencies.

- **Application:** Students learn to visualize how a change in a satellite’s power module affects its thermal regulation, communication bandwidth, and overall mission lifespan.
- **Industry Value:** This prepares graduates for roles in Mission Operations and Project Management, where understanding the “big picture” is more critical than deep specialization in a single component.

13.2 Human-Centric Design (HCD) for Extreme Environments

As we move toward long-term orbital habitation and lunar bases, the focus shifts from survival to thriving.

- **Design Element:** Applying ergonomics, psychological well-being, and sensory design to confined spaces.
- **Industry Value:** Graduates can contribute to Space Architecture and Industrial Design, creating habitats that mitigate the psychological strain of isolation and the physiological challenges of microgravity.

13.3 Rapid Prototyping and Iterative Testing (Fail Fast)

The new space era prioritizes speed and cost-effectiveness over the decade-long development cycles of the past, as exemplified by SpaceX as well as certain Indian startups.

- **Design Element:** Moving from CAD models to low-fidelity physical prototypes, then to high-fidelity simulations.
- **Industry Value:** Students trained in Agile Design methodologies are better suited for the Startup Ecosystem, where the ability to iterate on a drone sensor or a launch vehicle component quickly is a competitive advantage.

13.4 Data Visualization and Information Design

The space industry generates petabytes of data from Earth Observation (EO) satellites. This data is useless if it cannot be interpreted by decision-makers in agriculture, climate monitoring, or urban planning.

- **Design Element:** Translating complex datasets into intuitive, actionable visual interfaces (UX/UI).
- **Industry Value:** Graduates become Satellite Data Analysts or GIS (Geographic Information System) Experts, bridging the gap between raw space data and Earth-bound industries like insurance, farming, and disaster management.

13.5 Speculative Design and Ethics

Designing for 2040 requires imagining scenarios that do not yet exist, such as asteroid mining rights or orbital debris removal protocols.

- **Design Element:** Speculative design asks "What if?" to explore the ethical and social implications of new technologies.
- **Industry Value:** This creates a foundation for Space Policy Analysts and Space Lawyers who must design the legal and ethical frameworks for resource allocation and environmental protection in the "Celestial Commons."

13.6 Biomimicry in Engineering

Nature has solved complex problems of efficiency and resilience over billions of years. Design education often utilizes biomimicry to find non-obvious solutions.

- **Design Element:** Studying how biological structures (like honeycomb patterns or folding insect wings) can be applied to lightweight, deployable space structures.
- **Industry Value:** This leads to innovations in Materials Science and Mechanical Engineering, such as solar arrays that unfold like origami or radiation-shielding materials inspired by fungal growth.

By embedding these design pillars into Indian schools and colleges, the education system moves away from rote memorization toward producing creative technologists. These graduates will not just build the rockets, but will design the businesses, laws, and interfaces that make the space economy functional for everyone on Earth. There is already a push from the Indian government and Indian space agencies to enable such growth in the Indian economy (IN-SPACE).

14. Intellectual Property: The Missing Layer in Indian Education

One of the greatest weaknesses in India's innovation pipeline is limited awareness around intellectual property.

Students frequently create:

- prototypes,
- technical concepts,
- interfaces,
- systems,
- inventions, without understanding:
- patent frameworks,
- industrial design rights,
- licensing,
- valuation,
- commercialization.

Future-ready design education must therefore integrate:

- Patent literacy
- Technology transfer awareness
- IP management
- Startup ecosystems
- Technology readiness assessment
- Product-market validation

Innovation without IP strategy limits national competitiveness.

15. The Strategic Role of Facilitators

An important missing link in India's innovation ecosystem has been the effective facilitation of technology transfer and intellectual property (IP) commercialization between academia, research institutions, innovators, and industry. This critical function is best performed by institutions operating at the intersection of government, academia, and industry, enabling the seamless translation of research outcomes into commercially viable products and services.

National Research Development Corporation (NRDC) is one of India's premier institutions driving this innovation-to-industry interface. Historically recognized for its pivotal role in technology transfer and commercialization, NRDC is uniquely positioned to evolve into a national Innovation-to-Market Enablement Platform. By leveraging its extensive experience, institutional credibility, and nationwide network, NRDC can play a transformative role in accelerating the commercialization of indigenous technologies, strengthening industry–academia partnerships, fostering design-led innovation, and advancing the objectives of Atmanirbhar Bharat and Viksit Bharat 2047.

Its capabilities already span: I Technology commercialization I Intellectual property support I Technology & IP valuation I System engineering I Startup mentoring I Industry partnerships I Innovation financing I Design support I Technology readiness assessment This creates a rare institutional opportunity

Its capabilities already span:

- Technology commercialization
- Intellectual property support
- Technology valuation
- System engineering
- Startup mentoring
- Industry partnerships
- Innovation financing
- Design support
- Technology readiness assessment

This creates a rare institutional opportunity.

16. NRDC as the National Bridge Between Academia and Industry

NRDC can operationalize the Design Thinking roadmap through five strategic interventions.

16.1 National Design Innovation Network

NRDC can establish a nationwide network connecting:

- Universities
- Design institutions
- Engineering colleges
- Startups
- MSMEs
- Research labs
- Industry partners

This network can support collaborative innovation projects and cross-disciplinary product development.

16.2 Design-to-Deployment Labs

NRDC has established the Design Clinic Facility (DCF) to facilitate the translation of innovative ideas through design intervention into market-ready products and technologies. The facility aims to strengthen product design, enhance functionality, improve manufacturability, and accelerate the commercialization of innovations emerging from academia, startups, MSMEs, and research institutions.

The Design Clinic Facility supports:

- Product design and redesign
- Rapid prototyping
- Product validation and testing
- Systems integration
- Manufacturing feasibility assessment
- Functional performance improvement
- Design for manufacturability (DFM) and commercialization readiness

By providing end-to-end product development and design support, the Design Clinic Facility significantly bridges the gap between academic research, innovation, and commercially deployable products, thereby fostering innovation-driven entrepreneurship, technology commercialization, and industry adoption.

16.3 Intellectual Property Acceleration Programs

NRDC promotes IP awareness and commercialization through structured IP Acceleration Programs in educational institutions.

These programmes would support:

- IP awareness
- IP mentoring and advisory services
- Patent drafting and filing assistance
- Technology transfer and commercialization workshops
- IP valuation and licensing education
- Technology scouting and industry linkage
- Startup IP strategy and commercialization pathways
- Capacity building for faculty, researchers, innovators, and students

These initiatives would foster a strong culture of innovation and intellectual property creation and strengthen India's long-term innovation ownership and global competitiveness.

16.4 Technology Readiness & Commercialization Frameworks

Many academic innovations fail to reach the market because students and researchers are not adequately exposed to:

Market validation, manufacturing feasibility, deployment strategies, customer adoption, and scalability assessment.

NRDC can introduce standardized Technology Readiness Level (TRL) and commercialization frameworks across universities and innovation ecosystems to help innovators understand the progression of technologies from concept to market deployment.

This approach would enhance commercialization readiness and accelerate the successful translation of research into market-ready technologies.

16.5 Teacher & Faculty Capacity Building

The implementation of Design Thinking cannot succeed without educator transformation. NRDC can support:

- Faculty development programs on IPR
- Industry immersion opportunities

These initiatives would strengthen educators’ capabilities to nurture innovation, creativity, and entrepreneurship among students.

17. National Implementation Roadmap

To successfully implement design education, we propose a framework built on these core pillars:

Pillar 1 — Experiential Learning

- Project-based learning
- Real-world challenges
- Hands-on prototyping
- Portfolio-based assessment

Pillar 2 — Interdisciplinary Integration

- STEM + Design + Sustainability + Business
- Cross-functional problem-solving
- Systems thinking frameworks

Pillar 3 — Technology Enablement

- Ethical AI integration
- CAD/CAM exposure
- Digital fabrication
- Simulation technologies

Pillar 4 — Innovation & Entrepreneurship

- Startup incubation
- Product development pipelines
- Industry mentorship
- Innovation funding

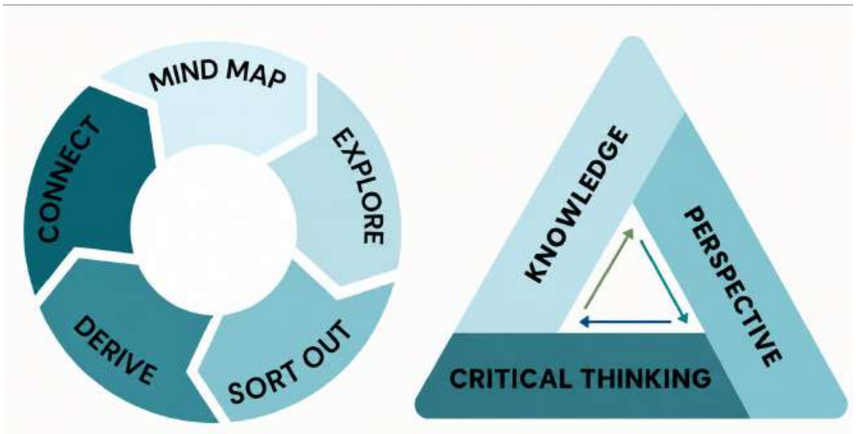
Pillar 5 — Commercialization & IP

- Patent literacy
- Technology transfer systems
- Licensing pathways
- Design protection awareness

Pillar 6 — Institutional Transformation

- Teacher training
- Innovation labs
- Industry-academia partnerships
- Outcome-based evaluation systems

17.1 The Approach for the First Four Pillars



The National Education Policy (NEP) 2020 shifts education from rote learning to experiential, competency-based and interdisciplinary learning. Design thinking at We-Learn naturally fits this framework.

i. Experiential & Project-Based Learning

- Students work on real-world problem statements
- Emphasis on prototyping, testing, iteration
- Portfolio-based outputs instead of exam-based outcomes

ii. Interdisciplinary Learning

- Design thinking modules combine: Art + Engineering + Psychology + Social awareness

Projects like:

- Sustainable cities
- User-centered product design
- Social impact challenges

iii. Skill-Based & Competency-Driven Education

- Research & insight building
- Ideation frameworks
- Visual communication
- Presentation & storytelling

iv. Learner-Centric & Flexible Education

- Customised pathways based on: Student interest (art, design, tech, social impact)
- Career goals (portfolio vs skill building)
- Open-ended projects (no single "correct" answer)

We-Learn is already ahead of the curve

i. **Early shift from rote to experiential learning**

Most education, since years, has been focusing on rote learning. Traditional schooling was built on the foundation of memorization, theories and exams.

We-Learn on the other hand:

- Focused on hands-on projects
- Encouraged questioning over memorisation

ii. **Interdisciplinary approach before it became policy**

Traditional approaches expect students to choose a stream - Science, Commerce, Arts, restricting not only the students' knowledge but also minimizing their perspective.

We-Learn on the other hand:

- Blended design + subjects + storytelling + research
- Treated learning as connected, not compartmentalised

iii. **Portfolio-based learning vs marks-based evaluation**

Most education systems have traditionally been exam-focused, often reducing students to scores rather than recognising their skills and potential.

We-Learn on the other hand:

- Built student portfolios by focusing on output, process, and thinking

iv. **Industry-relevant skill building**

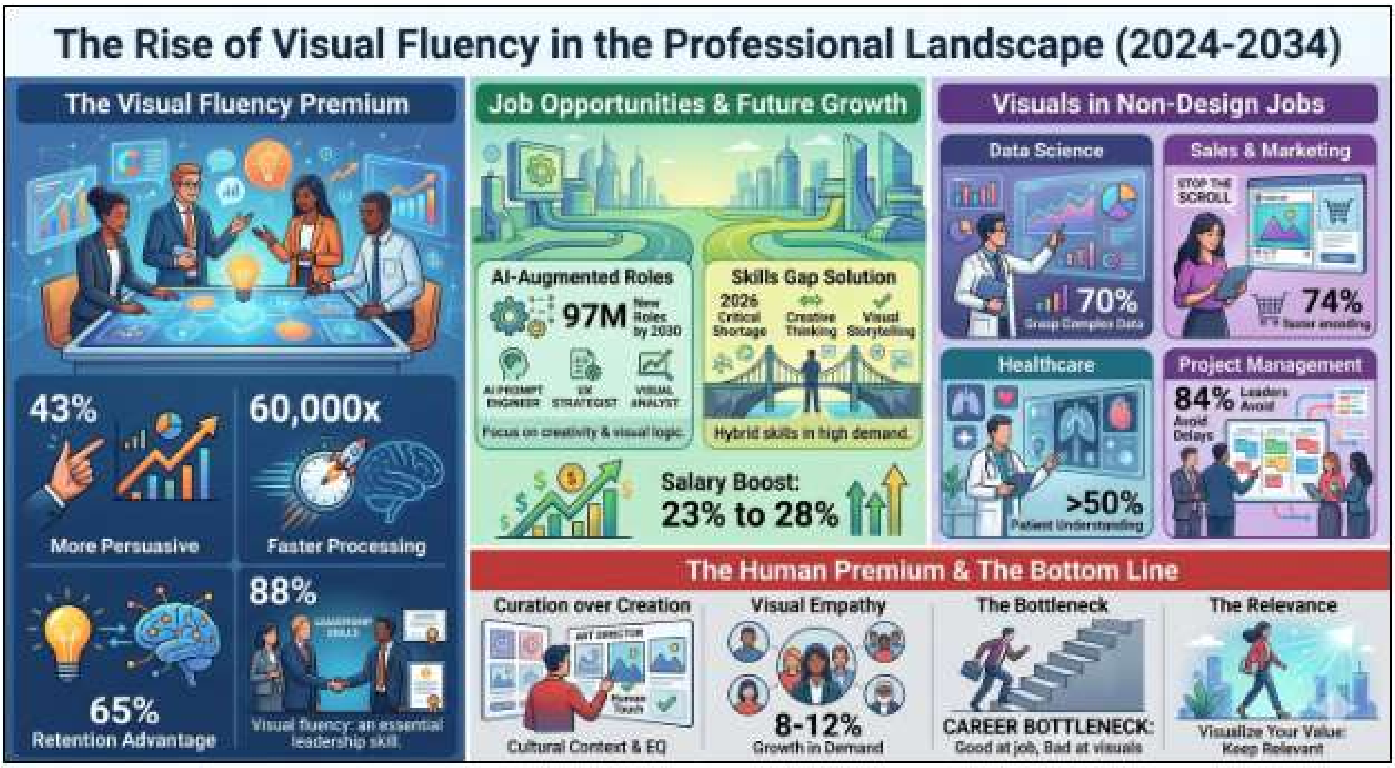
Following the system of textbook learning has impacted students' ability to think, innovate, create and adapt, making it increasingly difficult for students to walk into the real world.

We-Learn on the other hand trains students in:

- Design thinking workflows
- Presentation & pitching
- Real-world problem solving

We-Learn has been aligned with NEP 2020 long before its implementation. Our design thinking modules reflect our primary core vision, which is: experiential, interdisciplinary, and skill-based learning. Under the guidance of our founder - Neha Pandit, We-Learn developed a K–12 design thinking approach in India that moves beyond rote learning to real-world problem solving, making our students future-ready in a way that the education system is only now beginning to adopt.

Conclusion: From Knowledge Seekers to Future Architects



India's future competitiveness will depend not merely on how much knowledge its citizens possess, but on how effectively they can transform knowledge into innovation, systems, products, and societal value.

Design Thinking is not an elective enhancement.

It is the foundational operating system of the innovation economy.

Traditional educational systems prepare students to survive within existing systems. Design education empowers them to redesign those systems entirely.

By integrating Design Thinking into K–12 education, undergraduate learning, research ecosystems, startups, and commercialization frameworks, India can create a sovereign innovation workforce capable of shaping the future rather than merely responding to it.

Institutional national bridges are needed between:

- education and industry,
- research and markets,
- creativity and commercialization,
- invention and impact.

The transition from a knowledge economy to an innovation economy is no longer optional. Giving space to Design Education will ensure that by 2047, India is recognized as the world's leading "Design-First" superpower.

It is India's next developmental mandate.

References

1. World Economic Forum. The Future of Jobs Report 2023 https://www.weforum.org/reports/the-future-of-jobs-report-2023/ (World Economic Forum)
2. Government of India. National Education Policy 2020 https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
3. Indian National Space Promotion and Authorization Centre (IN-SPACe). Decadal Vision and Strategy for Indian Space Economy https://www.inspace.gov.in/ (YouTube)
4. World Economic Forum. Future Skills and Workforce Transformation https://www.weforum.org/agenda/2023/05/future-of-jobs-2023-skills/ (World Economic Forum)
5. Georgiev, G.V., & Georgiev, D.D. (2023). Quantitative Dynamics of Design Thinking and Creativity Perspectives in Company Context https://arxiv.org/abs/2306.10971 (arXiv)
6. Fu, Y. et al. (2024). Creativity in the Age of AI: Evaluating the Impact of Generative AI on Design Outputs and Designers’ Creative Thinking https://arxiv.org/abs/2411.00168 (arXiv)
7. Woodruff, A. et al. (2023). How Knowledge Workers Think Generative AI Will (Not) Transform Their Industries https://arxiv.org/abs/2310.06778 (arXiv)
8. Ministry of Education, Government of India. https://www.education.gov.in/
9. National Research Development Corporation (NRDC) https://www.nrdcindia.com/
10. Atal Innovation Mission, NITI Aayog https://aim.gov.in/
11. Startup India Initiative https://www.startupindia.gov.in/
12. Make in India Initiative https://www.makeinindia.com/

Hi, I'm Pencil.

You'll find me throughout this white paper as the official We-Learn mascot. Why a pencil? Because every idea begins with one. Before a design is built, a problem is solved, or a dream takes shape, it starts as a thought, a sketch, a note, or a question. The pencil is the foundation of learning, creativity, innovation, and expression.

And at the end of every pencil is an eraser. It represents the freedom to fail, the permission to explore, make mistakes, learn, and try again. Every erased line is proof that growth comes from having the courage to begin.

Just like a pencil helps turn ideas into reality, this white paper explores how Design Education can transform the way we learn, think, and create. It highlights the growing gap between traditional education and industry needs, and presents Design Thinking as a pathway to build future-ready learners, innovators, and problem-solvers for a rapidly changing world.

So sharpen your curiosity and turn the page. The future isn't just something we inherit, it's something we design.

Credits:
Mascot Drawings by Aishani Srivastava
Charts & Diagrams by Pragati Lahoti
Compiled by Ranbir Sangha
Designed by We-Learn