

# DESIGN THINKING FOR EDUCATION IN INDIA

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*The revised National Education Policy (NEP 2020) in India presents an opportunity to overcome the systemic inertia that has characterized the Indian education system since colonial times. This study explores how adopting a growth mindset through design thinking can benefit India's education system and establish a strong foundation for economic transformation, with innovation at its core. Drawing inspiration from global practices and contextualizing them for the Indian context, the authors conduct interviews with stakeholders from the Ministry of Education, the curriculum design committee, as well as with educators to inform their research. It also boosts its findings through analysis of media articles, journal papers, and policy documents. Considering the current classroom scenario, the paper introduces a framework emphasizing curiosity/exploration and review/reflection.*

*Keywords: Design Thinking, Education System, National Education Policy, Growth Mindset, Innovative Classroom Framework*

## 1. INTRODUCTION

### 1.1 EDUCATION IN INDIA: BACKGROUND

The *gurukul* education system of ancient India was holistic and intimately tied to the natural world. The *guru* (teacher) taught everything from Sanskrit to the holy scriptures and from mathematics to metaphysics. Learning was not confined to memorizing information and was closely linked to phenomena in nature and life. Learning became restricted to classrooms in 1830 with the introduction of the modern school system in India by the British, thus severing its link with nature (Kumar, *The Education System in India* 2022).

It has now been 75 years since India gained independence, and her constitution has made free and compulsory education a fundamental right for children between the ages of 6 and 14 (Wikimedia Foundation, *Education in India* 2023). UNICEF has acknowledged the great strides made by the country in improving access to quality education, increasing elementary school enrollment, and reducing the number of out-of-school children. Laws such as the Right of Children to Free and Compulsory Education Act, 2009 have bolstered these achievements (UNICEF India, *Education* 2019). More recently, in early 2020, India promulgated its third-ever national policy on education (Wikimedia Foundation, *National policy on education* 2023).

However, the education system, though evolving, has largely favored result-oriented and rote learning (repetition-based memorization) over encouraging an understanding of the subject (Nayak, *An antidote to rote learning* 2018). We would like to highlight some of the reasons why the system has been failing.

The first reason is the over-commercialization of education and the lack of good public schools. A news report by *India Today* states that nearly 50 percent of Indian children are enrolled in private schools,

which constitute a third of all schools. The article further says, "The government's dual role as the education provider through public schools and regulator of private schools leads to a conflict of interest" (Arora, *Private vs public education: Which industry is where and why?* 2020).

Secondly, the evaluation system followed in schools prioritizes scores and percentages over learning, leaving little room for creativity. A *Deccan Chronicle* article states that securing marks is the only thing on pupils' minds. As a result, there is less focus on achieving excellence beyond the exam (Prabhudev, *Indian education: Marks define the outcomes, not skills* 2018). As Yamini Aiyar says, "Where we have failed miserably is translating schooling into learning" (The Economist, *Why the world's biggest school system is failing its pupils* 2017).

Thirdly, the Indian education system's orientation towards career success is driven by an archaic mindset and herd mentality that gives disproportionate importance to a few fields of study, like engineering and management studies. Why such a focus may be misguided in present times becomes clear when we look at employment statistics. The Vice-Chairman of NITI Aayog, the country's apex public policy think-tank, recently flagged the stagnation of higher education with nearly half of the total engineering and management graduates remaining unemployed (The New Indian Express, *Higher education stagnated in India, 48% engineers unemployed: NITI Aayog V-C* 2022).

At present, India has a highly visible and large diaspora, with statistics stating that 1 out of 6 humans alive today are Indians. An increasing number of people of Indian origin now live and occupy high-ranking positions all over the world (Press Trust of India, *200 Indian-origin people occupy leadership positions in 15 countries, 60 hold Cabinet ranks* 2021). This may lead to the conclusion that, despite its problems, the Indian education system is still successful. However, their successes do not reflect the median education that Indians receive. While people can continue to debate the merits and demerits of the education system, there is always scope to improve the median experience.

## 1.2 WHY NOW?

In 2014, Dr. Shashi Tharoor, then Minister of State for Human Resource Development, said, "Education in India has made monumental progress since independence, but continues to face daunting challenges at multiple levels, particularly in terms of quality, infrastructure, and dropout rates. We have islands of excellence floating in a sea of mediocrity. And institutions here do not adequately prepare students for the jobs market, which is why many industries often have to spend time and effort on supplementary training for people they recruit (India Today, *Shashi Tharoor: Education in India has made monumental progress* 2014)." While Dr. Tharoor alludes to the quality of education, economists Amartya Sen and Jean Drèze, in *An Uncertain Glory: India and its Contradictions*, talk about similar inconsistencies in patterns of development, making India look like "islands of California in a sea of sub-Saharan Africa" (Tunzelmann, *An uncertain glory: India and its contradictions, by Jean Drèze and Amartya Sen, review* 2013).

No country in the world has as many young people as India, with 28% of the population under 14 years of age (Trines, *Education in India* 2022). As of 2018, 250 million students in total were enrolled in schools (Kanwal, *India: Number of enrolled students by School Type* 2021). The education system, therefore, needs our urgent attention. The problems mentioned above are hugely systemic, which makes tackling them that much more complex. Further, the education system is politicized and characterized by diverging interests and turf battles between agencies and bureaucracies at both the central and state levels (Trines, *Education in India* 2022).

India has missed the boat on many opportunities, such as timely macroeconomic reforms, meaningful

investments in primary health, and the incentivization of technology transfer to domestic industries from abroad (Narendranath, *India @75: Tale of missed opportunities* 2022). However, the country has also made leaps with certain technologies and ideas, an example being the rapid pan-India rollout of 4G and 5G networks. With these quick and successful changes, it might be the right time to do the same with education. The Union Education Minister and the government have started discussing the need to prepare youth to become job creators rather than job seekers (Tobgyal, *Need to prepare the youth to become job creators, not job seekers: Pradhan* 2022). What is needed is broader change, not incremental and piecemeal solutions to take advantage of the demographic dividend. In some aspects, India is like an elephant—it is slow, but when it moves, the world sits up and takes notice.

The National Education Policy, 2020 recommends transformational reforms that can give a new direction to India's vast education system. It emphasizes on increasing the enrollment ratio, enhancing the quality of education through innovation and research, and to bring out the best of every student's individual potential (Press Information Bureau, *National Education Policy 2020 Factsheet* 2021). However, the policy shows some confusion between *design education* and *design thinking for education*, which cuts across all the stakeholders. We unpack aspects of this confusion with the help of experts from the field and an analysis of the current system.

## 2. BRINGING DESIGN THINKING TO CLASSROOMS

### 2.1 DESIGN THINKING

*Design thinking* is a creative problem-solving approach. Though this process for innovation has been around for years, it was popularized by Tim Brown, co-chair of IDEO (a global design and innovation company) in an article for the Harvard Business Review (Brown, *Design Thinking* 2008). He wrote,

"Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."

Design thinking draws on the mindset that skilled designers cultivate and allows people who are not trained as designers to use creative tools to address challenges present in different realms (*IDEO Design Thinking*). With a view to solving it, it focuses on pinpointing the actual problem—not what seems like one—and promotes the use of shared methods and a shared language among people from vastly different backgrounds.

### 2.2 DESIGN THINKING IN EDUCATION

The above definition clues us into how a non-linear design thinking process can also be valid in the context of education. In an ideal classroom setting, the learning experience is interactive—students can ask questions until they are satisfied with the reasoning provided. They can frame questions, gather inspiration, generate ideas, make those ideas tangible, test them themselves (rather than be tested on how much of the classroom content they can memorize), and share what they learn through compelling storytelling.

Such a learning environment can be achieved while meeting current curriculum objectives. Educators need to be able to *employ* design thinking to help their students receive a holistic learning experience. The true worth of design thinking in the context of education will be realized only if it permeates the system in such a way that it does not have to be explicitly taught.

If we look back, there are elements of this approach in India's *gurukul* system, in which phenomena of

the world were observed, broken down, and taught holistically, not siloed by subjects. This way of learning is similar to the phenomenon-based learning (PBL/PhBL) that has been practiced in Finland's education system for decades, complemented by traditional subjects. This teaching style encourages students to apply various skills and concepts to start "connecting the dots" in what they learn at an early age. It resembles real-life problem-solving to give pupils a clearer understanding of the complexity of the world (Zareva, *The latest school reform in Finland introduces a new way to look at subjects* 2021).

The Finnish education ministry found this to be one of the more unique ways of teaching and has made it mandatory for all students aged 7 to 16 as a part of its New Curriculum Framework. Additionally, students in Finland often have the same teacher for up to six years of their education. The long association forges a relationship of mutual trust and bonding. It allows the educator to take up different roles in a student's life, like that of a mentor or even a family member (Wikimedia Foundation, *Phenomenon-based learning* 2022). Surprising factors like fewer compulsory years of education and no annual standardized tests have also contributed to making the Finnish education system one of the finest in the world (Colagrossi, *10 reasons why Finland's education system is the best in the world* 2018). Finnish students score higher than most of their peers on international assessment tests, despite peculiarities like minimal homework and a curriculum that puts a huge emphasis on music, the arts, and outdoor activities (Zareva, *The latest school reform in Finland introduces a new way to look at subjects* 2021).

Finland's approach is an example of the spirit and intent of design thinking permeating the system to the extent that it does not have to be recognized explicitly. Consequential value will only be derived if we move away from jargon and see how there can be a change brought about by using the design thinking mindset. If the system has empathy, is open to new ideas, dares to experiment, and is human-centered, then it is implicitly practicing design thinking. We believe this is the case in Finland. They did not have to decide to start practicing/teaching/learning design thinking from a particular day, but successfully infused their educational model with its principles.

To paint a contrasting picture, Singapore, a country smaller in area but with roughly the same population as Finland, has had a history of emphasizing rote learning, memorization, and hard work with high-stakes examination success as the end goal. However, Singaporean students also excel at international assessment tests, just like their counterparts in Finland. This has been possible through the continuous evolution of their education policy based on evidence, research, and long-term planning. The success of its education system can be attributed to changes like classroom innovation; a focus on vocational education; careful coordination of the curriculum, teaching, and assessment; and outstanding execution (AQi, *Singapore: Probably the best organised education system in the world* 2021).

This serves as an example that indicates that there isn't a singular way to adopt design thinking in educational reform. By adopting best practices from various other countries, as applicable to its unique context, India can improve its system to meet its needs and goals.

### 2.3 SENSE-MAKING: THE BROADER GOAL

The Indian government, through the Make in India and Aatmanirbhar Bharat (meaning self-reliant India) initiatives, aims not just to make India a manufacturing juggernaut but also to transform the economy with innovation at the forefront.

A NITI Aayog report titled "India Innovation Index 2020" states, "Innovation permeates into society and state, as both formal and informal institutions evolve with changes in societal interactions, culture,

communication, and even education structures, especially in this digital era. But this relation is symbiotic, as changes in society, economy, and the polity also play a role in driving innovation." In the context of this innovation, the report also talks about creating a conducive culture and reorienting the education system (NITI Aayog, *India Innovation Index 2020 2021*). However, there isn't a linear pathway to get there.

A report by the Observer Research Foundation concludes, "The experiences of successful countries show that science, technology and innovation policies that are integrated into national development strategies can help raise productivity, improve competitiveness, and foster economic growth (Vedachalam, *India's Innovation Ecosystem: Mapping the trends 2021*)." From 2015 to 2022, India has moved up from the 81<sup>st</sup> to the 40<sup>th</sup> position in the Global Innovation Index (Ministry of Commerce & Industry, *India climbs to the 40th rank in the global innovation index of WIPO 2022*). The continuation of this trend would be a testament to the successful implementation of a massive transformation effort.

Our primary focus here is to initiate a discourse on how this push toward building an innovative economy pans out in the education system of India. We wish to take stock of what is currently being done and make sense of how it aligns with the long-term goals mentioned above. Our focus is on the following three aspects that we think are designed to bring about systemic reforms in education:

1. The National Education Policy (NEP), 2020: This new policy aims to restructure the education system to be more interdisciplinary and fosters multiple initiatives to implement this.
2. The creation of Innovation Ambassadors: The Ministry of Education (MoE) has established Innovation Cells to systematically promote an "innovative culture" in schools and higher education institutions (India Innovation Council, *MoE Innovation Cell*).
3. The introduction of 'Design Thinking and Innovation' as a skill subject: The Central Board of Secondary Education (CBSE) now allows students to choose a skill subject in middle school, and has added eight new subjects to its existing list of subjects.

#### 2.4 NATIONAL EDUCATION POLICY, 2020

Over three decades after the last major revision, came the NEP, in 2020, a new national policy on education. Naturally, there were high expectations. Once it was passed, it received a mixed response, but this is not unusual for new policies. As states "implement" NEP, most changes in the education space are now attributed to this policy. However, can the many buzzwords present in the policy be connected to ground-level change?

Prof. R. Govinda of the Council for Social Development, in his critical examination of the policy, comments that the authors seem to have freed themselves from the fetters of past experiences and ground reality, allowing their imagination to fly into a scenario where unlimited financial resources are available, supported by highly motivated human resources and a high-efficiency administrative system, and with free access to frontline technological devices and artificial intelligence algorithms. "We cannot aspire to climb that height with a fragile ladder which, in fact, is the real state of contemporary Indian education" (Govinda, *NEP 2020: A critical examination 2020*).

A look at India's education budget can serve to support the above claim. The country's education budget has increased by 60% in the last ten years, which is dismal considering that the total budget went up by 170% in the same period (Jha, *Education budget in India: How it compares globally? 2022*). In terms of the percentage of GDP spent on education, India ranks 144/198 globally (Wikimedia Foundation, *List of*

countries by spending on education (% of GDP) 2022). In 2020, the Union Cabinet approved a plan to increase public spending to ~6% of GDP from the present ~4%. As NEP 2020 points out, the 6% of GDP level was also recommended in the 1968 policy and reaffirmed in the 1992 review (MHRD, *National Education Policy 2020*). If, when, and how that is realized remains to be seen.

Moreover, implementation is addressed only briefly in the NEP document. Various departments and agencies at both central and state levels are to lead the effort. Thus, subsequent interpretations, decisions, policies, directives, and programs will have to be studied over the coming years to see the change and progress with how well it aligns with the "spirit and intent" of the NEP. A *Forbes India* article discusses various forms of "policy chaos" (Sud, *Six tech policy strategies to boost innovation in India - Forbes India blogs 2022*); if unchecked, such chaos could be seen in the education space too.

In light of this uncertain space that education in India currently finds itself in, we propose that the incorporation of design thinking methods and tools into Indian education can be the way towards a more effective educational system.

### 3. FRAMEWORK FOR A BETTER CLASSROOM CULTURE

#### 3.1 CURIOSITY AND REFLECTION

Design thinking methods and tools can be used to help educators/teachers improve pedagogy to connect different taught concepts within the current curriculum, with the aim to enhance learning outcomes for students. Sarah Sekula says, "Regardless of interest, creative thinking and problem-solving are invaluable skills" (Sekula, *From abcs to CEOs: How these young entrepreneurs are making moves 2022*).

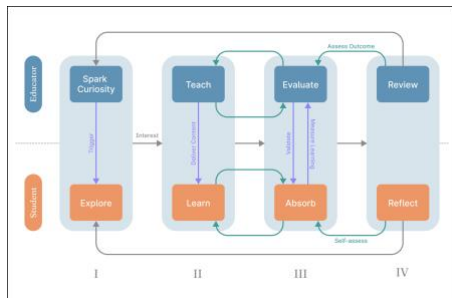


Figure 1. A framework to modify the cyclic pattern of teaching topics in a subject.

There is a cyclic pattern of curriculum delivery and assessment in the present-day classroom (Hudson, *Enacting the cyclical link between curriculum and assessment 2020*). However, when the curriculum is vast, the cycle is compressed without time for absorption and retention of the information delivered to students.

We hypothesize that students can have a more engaging experience if the cyclic pattern of teaching topics in a subject is consciously (and cautiously) modified into a four-phase process to create a better classroom culture, as shown in Figure 1.

The two perspectives present in a classroom are of the educator and the student. Children are naturally curious, and this curiosity can be stifled if concepts are unilaterally delivered just because they are part of the curriculum without a clear explanation of why they are being taught and how they fit into the student's understanding of the world.

Before a new topic or chapter is taught, the educator should spark the student's curiosity such that it

encourages an exploration of the topic by the students. The formal introduction of the topic in the classroom should come after this. Curiosity can be sparked through a simple question, task, or something to observe in one's surroundings. An exploration of the topic could lead to unanswered questions in the students' minds and generate interest in the topic that follows. For example, before introducing the concept of gravity, students can be asked to see how to stop water from falling out of an upturned glass with a just piece of card (SMG Learning, *Gravity-defying water activity* 2022). On the other side, an interested cohort of students is also a motivator for the educator.

The educator should teach and deliver the content as laid out in the curriculum, keeping in mind that all questions that come up in the exploration are addressed, directly or indirectly. Students can then learn the subject matter and make sense of the phenomena through their explorations.

This leads to a cycle of learning and absorption for students and teaching and evaluation for educators. Absorption is a measure of learning, and evaluation validates it. This evaluation shouldn't be limited to objective measures like examinations and tests. The educator should have some latitude to come up with subjective measures based on the classroom experience.

Lastly, students should spend time reflecting on what they have learned. This can help them look back, connect the dots from their initial explorations, and identify other instances where this new knowledge is applicable in their environment. Thus, a self-assessment of the absorption of knowledge could be performed. Educators can review this cycle and assess the outcomes based on the evaluation phase.

These phases can be aided by various design thinking methods and techniques that are adapted to the classroom context. Students do not need to gain an understanding of design thinking as a concept for this. Educators who have a good understanding of these methods can wield them effectively to gradually create a conducive learning environment. This can work well with the NEP, which looks to give teachers more autonomy in choosing pedagogy methods (MHRD, *National Education Policy* 2020).

Game-based activities help trigger and maintain situational interest, as the mind naturally attends to situations that have missing details. To foster student engagement, classroom instruction decisions should be based on four emblematic questions: (i) How do I feel? (ii) Am I interested? (iii) Is this important? (iv) Can I do this? The first two questions focus on the attention of the student, and the last two questions gauge the engagement of the student's interest in the topic (Marzano, *The highly engaged classroom, tips* 2010).

While looking at previous work that might align with our hypotheses, we came across psychologist Carol Dweck's research on fostering the growth mindset. She talks about how some teachers make students' progress explicit by giving pre-tests at the beginning of a unit that purposely cover material students do not know. When students compare their inevitably poor performance on these pre-tests with their improved performance on unit post-tests, they get used to the idea that, with application, they can become smarter (Dweck, *Even geniuses work hard* 2010). Our four-phase framework aligns well with her research. However, care would have to be taken to establish the distinct nature and purpose of pre-tests as opposed to post-tests, which are currently embedded in the system as unit tests/examinations where the expectation is to get a high score.

She further states that homework assignments should not feel like mindless, repetitive exercises; rather, they should present novel problems for students to solve, require them to apply what they've learned in new ways, or ask them to stretch their knowledge to the next level. For example, suppose students are studying the rise and fall of civilizations. Their homework assignment could be to design a civilization that either thrives (by building in positive factors) or implodes (by building in risk factors). They can write

the story of their civilization and what happened to it. Alternatively, if students are studying Shakespeare's sonnets, for homework, they could write a sonnet to a person or animal of their choice in Shakespearean style (Dweck, *Even geniuses work hard* 2010). Evaluating such homework assignments would be a great way to measure learning and for the student to self-assess the absorption of concepts.

By adopting this four-phase process, educators can enhance the classroom experience for students, foster curiosity, and promote reflection. This method not only aligns well with existing research but also supports the goals of the NEP to give teachers more autonomy in pedagogical decisions. With the right training and support, educators can effectively use design thinking tools and methods to create a more engaging, curiosity-driven, and reflective learning environment for their students.

#### **4. MINDSET SHIFT**

To adopt the suggestions laid out in this paper, a mindset shift is required. Change can occur only with such a shift in students, educators, parents, and administrators. Those with a *growth mindset* believe that intelligence can be developed and abilities can be enhanced through the learning process. Carol Dweck has researched how mindsets affect a student's performance in the classroom. Students engaged in more challenging learning activities have more opportunities to make mistakes and struggle, allowing the teacher to explore new strategies to impart learning (Wikimedia Foundation, *Mindset* 2023). Her research has shown that praising students for the process they have engaged in—the effort they applied, the strategies they used, the choices they made, the persistence they displayed, and so on—yields more long-term benefits than telling them they are "smart" when they succeed (Dweck, *Even geniuses work hard* 2010).

Students need to be in an environment that normalizes failure, accepts non-singular solutions, acknowledges different viewpoints, promotes non-linear thinking, encourages questioning, and is conducive to developing a scientific temper. To allow for this, examinations and evaluations would have to test for understanding and application of concepts instead of memorization ability. The execution is, of course, not easy. Subjective questions can be answered in many different ways, and those evaluating these answers cannot rely on simple answer keys to evaluate them. They would require more time to read and process these answers. It can take a whole generation to change mindsets. It is a long-term process that cannot materialize as fast as updates to the curriculum.

#### **5. CONCLUSION**

Bringing about change in the education system is not an easy process. What we've talked about merely scratches the surface and touches one small aspect of an elaborate system that goes beyond our scope and ability to untangle. We are not iconoclasts calling to remake a system, aspects of which have greatly benefitted millions over decades. However, we are believers in change being the only constant.

The framework and thought experiment we have put forth are hypotheses at best. They would need multiple rounds of iterative implementation and empirical evidence to ascertain what works and what can be tweaked to bring about a new classroom culture. Revamping a policy is not equivalent to solving a problem, but granularity and attention to detail in its implementation is what will bring about change. NEP 2020 has built the foundation for such change. The renewed focus on education is exciting, and we are optimistic of its compounding effect alongside India's demographic dividend. A paradigm shift in Indian education can empower a new generation to transform the lives of over a billion people.



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