Educational Quest: An Int. J. of Education and Applied Social Sciences: Vol. 15, No. 01, pp. 01-08, April 2024
DOI: 10.30954/2230-7311.1.2024.1
Peer Reviewed Journal

Exploring the Possibilities of Design Thinking in Indian Education: A Pathway to Innovation

Nupur Prakash

University School of Education, Guru Gobind Singh Indraprastha University, Delhi, India

Corresponding author: nupur95prakash@gmail.com

Received: 12-01-2024 **Revised:** 30-03-2024 **Accepted:** 07-04-2024

ABSTRACT

The incorporation of design thinking principles into Indian education presents an innovative approach to modernize and enrich learning experiences. Design thinking, known for its iterative and human-centered approach, has the potential to address shortcomings in traditional educational practices in India. This study delves into the integration of design thinking into the development of curricula, Teacher training, and improvement of school infrastructure. This integration offers various advantages, including the promotion of creativity, enhancement of problem-solving abilities, increased student engagement, and the cultivation of essential 21st-century skills. Nonetheless, there are challenges to be surmounted, such as resistance to change, limitations in resources, and complexities in assessment. To overcome these obstacles, the study suggests strategic solutions, including comprehensive training initiatives, mentorship programs, collaborative learning communities, resource accessibility, the cultivation of supportive school environments, and integration into teacher education programs. This research paper provides a practical guide for educational policymakers, administrators, and educators to leverage the potential of design thinking in revolutionizing the Indian education system. By implementing these recommendations, educators can effectively nurture an environment of innovation and critical thinking among students, equipping them to meet the multifaceted demands of the 21st century. Through the exploration of existing studies and the proposal of a theoretical framework, this paper seeks to offer feasible insights and tangible steps for the integration of design thinking into the Indian education system. In conclusion, the adoption of design thinking in Indian educational institutions stands to significantly enhance educational outcomes, despite the prospective challenges inherent in its implementation.

Keywords: Design Thinking, Indian Education, Curriculum Development, Teacher Training, 21st-Century Skills, Educational Transformation

The educational system in India is among the largest globally, catering to more than 250 million students in over 1.5 million schools (Nic, n.d.). However, it faces significant challenges, including rote learning, outdated curricula, and a lack of focus on creativity and critical thinking (Kumar, 2005). Traditional teaching methods do not adequately prepare students for the complexities of the modern world (Razzouk & Shute, 2012). UNICEF has acknowledged India's progress in expanding access to high-quality education, increasing enrollment in elementary schools, and reducing the number of out-of-school children (*India: Every Child Learns – UNICEF Education Strategy 2019 – 2030*, n.d.) with the help of the Right of Children to Free and Compulsory Education Act, 2009.

In early 2020, India introduced its third national policy on education, addressing these challenges further. The current Indian education system emphasizes theoretical knowledge over practical application, leading to a gap between students'

How to cite this article: Prakash, N. (2024). Exploring the Possibilities of Design Thinking in Indian Education: A Pathway to Innovation. *Educational Quest: An Int. J. Edu. Appl. Soc. Sci.*, **15**(01): 01-08.

Source of Support: None; **Conflict of Interest:** None

learning and the skills required for real-world success (*National Policy on Education*, 2024). Insufficient opportunities for students to engage in creative thinking, problem-solving, and collaborative learning have been observed globally (Carroll *et al.* 2010).

Addressing these issues necessitates a shift in teaching methodologies towards more experiential and student-centered learning models (*Design Kit: The Human-Centered Design Toolkit*, n.d.). There is an increasing recognition of the need for innovative educational approaches to better equip students with critical 21st-century skills (Brown, 2009). In response to this, the National Education Policy (NEP) 2020 in India aims to revamp the educational system to prepare students for a rapidly changing world. This policy emphasizes the importance of 21st-century skills such as critical thinking, creativity, collaboration, and communication, aligning closely with the principles of design thinking.

The NEP 2020 envisions a holistic, flexible, and multidisciplinary education system tailored to meet the needs of the 21st century and highlight each student's unique capabilities. The key objectives of the NEP 2020 are to ensure equitable access to quality education from preschool to secondary level, eliminate disparities, support disadvantaged groups, enhance education quality to meet global standards, make education affordable and accessible, and establish a robust framework for governance and accountability. These objectives underscore the importance of an education system that not only imparts knowledge but also equips students with essential life skills (Nic, n.d.)

The concept of "21st-century skills" refers to the comprehensive set of knowledge, competencies, work ethic, and personal qualities that are essential for achieving success in today's society, particularly within higher education programs and contemporary professional environments. These skills include critical thinking and problem-solving, creativity and innovation, effective communication, collaboration, information literacy, media literacy, technology literacy, flexibility and adaptability, initiative and self-direction, and social and cross-cultural skills. The importance of these skills is acknowledged by employers and is also integrated into university curricula (*Employers Rate It, Universities Teach It, but What Is Critical Thinking?, 2020).* This indicates the increasing recognition of the significance of 21st-century skills in preparing individuals for the demands of the modern world.

The educational approach advocated by NEP 2020 prioritizes the development of 21st-century skills by moving away from memorization-based learning to competency-based learning, with a focus on fostering analytical and creative thinking. It emphasizes the need for a curriculum that highlights critical thinking, creativity, collaboration, and communication, necessitating a shift in teaching methods toward experiential, project-based, and inquiry-based learning. The continuous professional development of educators is deemed essential to equip them with innovative teaching approaches that facilitate active learning and critical thinking (Mukherjee, 2024). Furthermore, the policy recommends holistic and formative assessments to evaluate a wide range of skills, such as critical thinking, creativity, and problem-solving, rather than relying solely on traditional examinations (Ministry of Human Resource Development, Government of India, 2020). The integration of technology in education is also emphasized, with digital tools enhancing learning experiences and aiding students in developing digital and information literacy skills (*Education at a Glance 2018*, n.d.) The transformative initiatives of NEP 2020 seek to enhance enrollment rates, improve education quality through innovation and research, and unleash the potential of every student The current wave of the industrial revolution necessitates that research and development incorporate essential skills such as critical thinking, creativity, adaptability, risk-taking, and other traits associated with entrepreneurship. Governments must prioritize education in fields such as computing, data analysis, artificial intelligence, and design thinking to provide continuous training for the workforce. The National Innovation and Startup Policy 2019 serves as a guiding structure, enabling educational institutions to actively involve students and faculty in activities related to innovation and entrepreneurship. (*Cabinet Approves National Education Policy 2020, Paving Way for Transformational Reforms in School and Higher Education Systems in the Country*, n.d.). However, there is a need for further clarity on the differentiation between design education and design thinking for education, which has implications for all stakeholders.

Purpose of the study

The primary objective of this research is to investigate the viability of design thinking as an innovative strategy to tackle the difficulties encountered by the education system in India. By incorporating the principles of design thinking into educational methodologies, this study aims to illustrate how this approach could cultivate a more inventive, captivating, and successful learning atmosphere. The research will present a conceptual structure for integrating design thinking in Indian educational institutions, examine its potential advantages, and pinpoint the obstacles and methods for successful integration (Brown, 2009).

Research Questions

To guide this exploration, the paper addresses the following research questions:

1. How can design thinking principles be integrated into the Indian education system?
2. What are the potential benefits and challenges of implementing design thinking in Indian schools?
3. What strategies can be employed to train teachers in design thinking methodologies effectively?

By addressing these questions, the paper aims to contribute to the ongoing discourse on educational reform in India, offering insights and recommendations for policymakers, educators, and researchers committed to fostering innovation and excellence in education (Government of India, Ministry of Human Resource Development, 2020; Kumar, 2005; Razzouk & Shute, 2012).

Research Methodology

Theoretical exploration of studies on design thinking, its principles, and its application in education was conducted. The case studies and research findings related to the integration of design thinking in educational systems worldwide were analyzed to identify best practices and potential pitfalls.

Theoretical Framework

Design thinking is an innovative approach centered around people's needs, the potential of technology, and the prerequisites for business success, integrating the designer's toolset (Brown, 2009). The process is comprised of five primary phases: empathize, define, ideate, prototype, and test, all of which are iterative, emphasizing continuous feedback and development. Due to its emphasis on creativity and the resolution of complex issues, design thinking has gained widespread acceptance across diverse fields such as business, healthcare, and education (Foster, 2019). Its application in educational environments is particularly valuable as it highlights empathy and user-centered design, crucial for creating meaningful learning experiences. Recognizing the needs and obstacles faced by students is imperative within this framework (Rowe, 2017).

Principles of Design Thinking

The process of design thinking comprises five main stages, as follows:

1. Empathize: Understanding the requirements and difficulties of students by directly observing and interacting with them (Brown, 2009). This step involves empathizing with the users to gain an in-depth understanding of their experiences and emotions (*Design Kit: The Human-Centered Design Toolkit*, n.d.).
2. Define: Expressing the fundamental issues and challenges based on the insights obtained during the empathize phase. This phase involves synthesizing information to identify the crucial problems that need to be tackled (Razzouk & Shute, 2012).
3. Ideate: Generating a broad range of innovative solutions through brainstorming and other ideation techniques. This stage promotes divergent thinking, allowing for the exploration of multiple possibilities (Brenner *et al.* 2016).
4. Prototype: creating tangible representations of the ideas generated to explore their feasibility. Prototyping enables rapid experimentation and learning from failure (Carroll *et al.* 2010).
5. Test: Implementing prototypes in real-world scenarios and collecting feedback for further refinement. This stage involves iterative testing and refinement to ensure that the solutions meet the users' needs (Dorst, 2011).

Design Thinking in Education

Incorporating design thinking into the field of education has exhibited encouraging outcomes in enriching students' creativity, collaboration, and problem-solving abilities (Razzouk & Shute, 2012). By involving students in the process of design thinking, educators have the opportunity to establish learning settings that are more participatory and student-focused. Carroll *et al.* (2010) demonstrated the efficacy of design thinking in a middle school environment, where students engaged in authentic projects and formulated innovative resolutions to intricate challenges. The research revealed that students who took part in design thinking activities exhibited heightened involvement, motivation, and academic achievement. Furthermore, design thinking has been associated with the cultivation of 21st-century competencies, such as critical thinking, communication, and teamwork. These proficiencies are crucial for thriving in today's swiftly evolving world and are frequently disregarded in traditional educational frameworks (Dorst, 2011).

There is a need to make a shift from traditional ways of teaching and learning to develop competent new generations by inculcating futuristic 21st-century skills in them. The educational system in India has historically emphasized rote learning and prioritized exam results over a comprehensive understanding of subjects (Nayak, 2018). With large class sizes, teachers find it challenging to provide individual attention, hindering the adoption of innovative teaching methods that require personalized instruction. Moreover, limited access to technology, educational materials, and trained staff restricts the implementation of new teaching strategies. The rigid curriculum, focused on standardized testing and rote learning, limits flexibility and experimentation, making it difficult for educators to incorporate dynamic and student-centered approaches like project-based learning and design thinking (Chand, 2023). These challenges collectively create an environment that impedes the adoption of innovative educational practices, ultimately affecting the overall quality of education in India. Nevertheless, there is a growing recognition of the need for reform, and initiatives such as design thinking offer the potential for creating more dynamic and engaging learning environments.

Design Thinking in Education: Case Studies from different countries

Based on various research studies, the use of design thinking has shown promising results in educational environments. Meinel, Leifer, and Plattner (2011) specifically observed the application of design thinking in a university setting, where students collaborated on multidisciplinary projects. The study concluded that design thinking enhanced students' problem-solving abilities by fostering critical and creative thinking.

- In Finland, the educational system combines traditional subjects with phenomenon-based learning (PBL/PhBL), a pedagogical approach that has been integral to the country's educational framework for many years. This style of teaching encourages students to integrate different skills and concepts early on, allowing them to make connections between various areas of study. This approach closely resembles real-world problem-solving, providing students with a deeper understanding of the complexities of the world (Zareva, 2021). The educational system in Finland serves as an example of how design thinking principles can be seamlessly embedded into an entire system without explicit acknowledgment. By prioritizing human-centric, empathetic, and innovative approaches, Finland has effectively integrated design thinking into its educational model as an implicit practice rather than a separate entity.
- At Stanford University's Hasso Plattner Institute of Design (d.school), design thinking is an integral part of the curriculum, encouraging students to address real-world challenges through empathy, ideation, prototyping, and testing. (*Design Kit: The Human-Centered Design Toolkit*, n.d.)
- In addition, Project-Based Learning (PBL) has gained prominence in schools, involving students in projects that necessitate critical thinking, creativity, and collaboration. This methodology mirrors the stages of design thinking and aligns with the skills emphasized in the 21st century (Razzouk & Shute, 2012).

Application of Design Thinking in Indian Education

Applying design thinking to Indian education involves adapting these principles to the local context. This can be achieved through:

1. Curriculum Development

Project-Based Learning (PBL): When implementing a curriculum, it is essential to incorporate Project-Based Learning (PBL) as a method to integrate design thinking. A suggested approach is to structure projects to follow the stages of design thinking, which include: Empathize, Define, Ideate, Prototype, and Test (Seidel & Fixson, 2013). For example, students could engage in a science project that involves identifying a local environmental issue, brainstorming solutions, creating prototypes, and testing their effectiveness. The implementation of Design Thinking and Project Based Learning (DT-PBL) methodology has been observed to significantly improve students' creativity and problem-solving abilities. This approach facilitates the development of essential skills outside the conventional classroom environment. Additionally, it has been noted that DT-PBL can revolutionize the training methods for educators, providing them with new tools to effectively respond to the changing educational dynamics (Jia *et al.* 2023).

Interdisciplinary Learning: Promoting interdisciplinary projects is important as they require students to apply knowledge from multiple subjects, thus mirroring real-world problem-solving and fostering a holistic understanding. For instance, a project may combine elements of history, art, and technology to create a multimedia presentation on a historical event (Abdulrahaman *et al.* 2020).

2. Teacher Training and Professional Development

Workshops and Training Programs: Regular workshops and training programs can equip teachers with the necessary skills to facilitate design thinking. These programs should include hands-on activities, collaborative projects, and opportunities for teachers to develop their design thinking projects (Plattner, Meinel, & Leifer, 2011).

Ongoing Support and Communities of Practice: Establishing communities of practice where educators can share experiences, challenges, and successes can support the continuous improvement of design thinking integration. Online platforms and regular meet-ups can be effective for this purpose (Razzouk & Shute, 2012).

3. School Infrastructure and Resources

Create Collaborative Spaces: In educational settings, it is essential to establish adaptable and communal environments that support collective work and innovation. This can be achieved through the provision of spaces furnished with flexible furniture, whiteboards, and supplies for creating prototypes (Carroll *et al.* 2010).

Access to Technology: access to digital tools and resources is imperative in augmenting the process of design thinking. Schools should ensure the availability of suitable technology for activities such as research, prototyping, and exploring potential solutions (Brown, 2009).

4. Assessment and Evaluation

Develop New Assessment Methods: It is important to consider alternative assessment methods when evaluating design thinking projects, as traditional exams may not effectively measure the desired outcomes. New assessment techniques should aim to assess students' creativity, problem-solving abilities, and capacity to incorporate feedback into iterative processes. Effective tools for this purpose may include rubrics and reflective journals (Rubio, 2017). Design thinking offers students the opportunity to go beyond simply validating or replicating existing ideas. To ensure that the design process is purposeful and supports the instructional dimensions mentioned earlier, it is essential to have clear evaluation strategies in place. Evaluation and assessment in design thinking should encompass several key areas:

Problem Identification and Solutions: This involves examining how students arrived at a specific solution or idea, the process they followed, and whether they activated and demonstrated prior knowledge. It also encompasses assessing the range of solutions considered by students.

Research and Exploration: This involves evaluating the breadth of research utilized in developing a solution and how prior knowledge was demonstrated and enhanced during this process.

Design Techniques: This entails assessing the variety of computer-assisted or manual techniques used for prototyping and determining the level of competency demonstrated.

Effectiveness of Solutions: This involves evaluating how well the solution addresses the problem, the metacognitive processes used to assess the solution, and the protocols students imagined for testing a particular solution.

In the context of design thinking, assessment is not restricted to a post-project phase but is encouraged throughout the process. This ongoing assessment identifies issues, devises a plan, tracks thinking, reflects on progress and project constraints, makes enhancements, and synthesizes thinking.

Potential Benefits of Implementing Design Thinking in Indian Schools

Enhanced Creativity and Innovation: Design thinking promotes a culture of innovation by encouraging students to explore diverse solutions to problems, thereby nurturing their creative confidence (Groeger *et al.* 2019).

Improved Problem-Solving Skills: Engaging in iterative problem-solving through design thinking helps students develop critical thinking abilities to identify, analyze, and solve complex problems (Dorst, 2011).

Increased Student Engagement: Design thinking facilitates active learning, leading to greater student engagement and motivation as they take ownership of meaningful projects (Carroll *et al.* 2010).

Development of 21st-Century Skills: Design thinking fosters collaboration, effective communication, and empathy, which are vital skills for success in the 21st century (Razzouk & Shute, 2012).

The major challenges in the way of implementation of Design Thinking in Indian Education

Resistance to Change: Educators and administrators who are accustomed to conventional teaching approaches may be hesitant to embrace design thinking. Overcoming this resistance necessitates a shift in mindset and the establishment of a supportive culture that places a premium on innovation and experimentation (Kumar, 2005).

Resource Constraints: The implementation of design thinking necessitates the availability of time, materials, and adequately trained personnel, which may be in short supply in numerous Indian educational institutions. Addressing these constraints requires meticulous strategic planning and judicious resource allocation (*Resource Constraints in Implementing the NEP 2020*, 2022)

Assessment Difficulties: Conventional assessment techniques may not effectively capture the outcomes of design thinking activities. Developing new evaluation frameworks that gauge creativity, problem-solving abilities, and iterative enhancement is daunting but essential (Rubio, 2017)

Strategies to Effectively Train Teachers in Design Thinking Methodologies

Initial Workshops: Initiate the process with extensive workshops that familiarize educators with the principles of design thinking and offer practical engagement with each stage of the process (Seidel & Fixson, 2013).

Ongoing Professional Development: Following the initial training, with continuous professional development opportunities, including webinars, advanced workshops, and collaborative projects. Sustained learning is crucial for educators to enhance their skills and remain abreast of best practices (Plattner, Meinel, & Leifer, 2011).

Mentorship and Coaching: Pairing educators new to design thinking with experienced mentors who can offer guidance and assistance. Mentorship programs can assist educators in addressing challenges and effectively implementing design thinking in their classrooms (Razzouk & Shute, 2012).

Collaborative Learning Communities: Establishing collaborative learning communities where educators can exchange their experiences, hurdles, and triumphs with design thinking. These communities can be facilitated through online platforms, regular meet-ups, and professional networks (Michlewski, 2015).

Access to Resources and Toolkits: Providing educators with access to resources and toolkits that present practical strategies and examples for integrating design thinking into their teaching. Resources should encompass lesson plans, project ideas, and assessment tools (*Design Kit: The Human-Centered Design Toolkit*, n.d.).

Supportive School Culture: Cultivating a school culture that recognizes innovation, experimentation, and continuous enhancement. School leaders should promote and encourage educators to experiment with design thinking and provide the requisite resources and infrastructure (Kumar, 2005).

Integration into Teacher Education Programs: Embedding design thinking into pre-service teacher education programs to ensure that new teachers commence their careers with a strong grasp of design thinking principles and practices. Teacher education programs should encompass coursework and practicum experiences focused on design thinking (Brown, 2009).

Policy Support: Endorsing support from educational policymakers is indispensable to provide the necessary resources and create a conducive environment for design thinking. Policymakers should prioritize the integration of design thinking into the curriculum and allocate resources to bolster its implementation (Nic, n.d.).

CONCLUSION

The incorporation of design thinking principles in the Indian education system presents a promising opportunity to renew and improve educational methodologies. This theoretical investigation emphasizes the advantages of design thinking in nurturing innovation, enhancing problem-solving abilities, and increasing student involvement, all of which are essential for equipping students to navigate the intricacies of the 21st century. Through the application of a human-centered approach, education becomes more pertinent and immersive, bridging the divide between theoretical knowledge and practical implementation. Nonetheless, obstacles such as resistance to change, limited resources, and assessment complexities need to be overcome. A well-devised approach involving extensive training initiatives, mentorship programs, collaborative learning communities, and adaptable learning environments is imperative. Furthermore, the integration of design thinking into pre-service teacher education programs and the fostering of an encouraging school environment are crucial for successful execution. Despite the challenges, the potential advantages of design thinking far surpass the hindrances, aligning with national educational reforms and elevating global competitiveness. Policymakers, administrators, and educators must collaborate to execute the strategies delineated in this paper to fully exploit the transformative potential of design thinking in reforming Indian education.

Further direction

Future research and pilot programs are essential to explore the practical implications of design thinking in diverse educational contexts across India. Longitudinal studies can provide valuable insights into the sustained effects on student outcomes and educator efficacy. It is imperative to develop comprehensive assessment frameworks that effectively capture the iterative and imaginative essence of design thinking to showcase its significance. Collaborating with international educational establishments can offer valuable perspectives and resources, facilitating the exchange of best practices and pioneering approaches. Through the ongoing refinement of integration strategies, the Indian education system can progress towards a more dynamic, student-centric learning paradigm. The successful assimilation of design thinking demands a collective endeavor from all stakeholders, encompassing government bodies, educational institutions, educators, learners, and the community. With a mutual ambition to nurture innovation and creativity, design thinking has the potential to become a fundamental element of educational eminence in India.

REFERENCES

Abdulrahaman, M., Faruk, N., Oloyede, A., Surajudeen-Bakinde, N., Olawoyin, L., Mejabi, O., Imam-Fulani, Y., Fahm, A. and Azeez, A. 2020. Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, **6**(11): e05312.

Brenner, W., Uebernickel, F. and Abrell, T. 2016. Design Thinking as Mindset, Process, and Toolbox. In *Springer eBooks* (pp. 3–21). https://doi.org/10.1007/978-3-319-26100-3_1

Cabinet Approves National Education Policy 2020, paving way for transformational reforms in school and higher education systems in the country. (n.d.). https://pib.gov.in/PressReleseDetail.aspx?PRID=1642049

Carroll, M., Goldman, S., Britos, L., Koh, J., Royalty, A. and Hornstein, M. 2010. Destination, Imagination and the Fires Within: Design Thinking in a Middle School Classroom. *The International Journal of Art & Design Education/ International Journal of Art & Design Education*, **29**(1): 37–53.

Chand, G.B. 2023. Teaching Large Classes: What Teachers Say and Do? *Far Western Review : A Bi-annual Multidisciplinary Peer Reviewed Journal*, **1**(1): 43–54.

Design Kit: The Human-Centered Design Toolkit. (n.d.). IDEO. https://www.ideo.com/journal/design-kit-the-human-centered-design-toolkit

Dorst, K. 2011. The core of 'design thinking' and its application. *Design Studies*, **32**(6): 521–532.

Education at a Glance 2018. (n.d.). https://www.oecd-ilibrary.org/education/ education -at-a-glance-2018_eag-2018-en

Employers rate it, universities teach it, but what is critical thinking? 2020. World Economic Forum. https://www.weforum.org/agenda/2016/11/critical-thinking-what-is-it-and-why-does-it-matter/

Foster, M.K. 2019. Design Thinking: A Creative Approach to Problem Solving. *Management Teaching Review*, **6**(2): 123–140.

Gonen, E. 2019. Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation (2009). *Markets, Globalization & Development Review*, **04**(02).

Groeger, L., Schweitzer, J., Sobel, L. and Malcolm, B. 2019a. Design Thinking Mindset. *Conference Proceedings of the Academy for Design Innovation Management*, **2**(1).

Groeger, L., Schweitzer, J., Sobel, L. and Malcolm, B. 2019b. Design Thinking Mindset. *Conference Proceedings of the Academy for Design Innovation Management*, **2**(1).

India: Every Child Learns – UNICEF Education Strategy 2019 – 2030. (n.d.). UNICEF.

Jia, L., Jalaludin, N.A. and Rasul, S. 2023. Design Thinking and Project-Based Learning (DT-PBL): A Review of the Literature. *International Journal of Learning, Teaching and Educational Research/International Journal of Learning, Teaching and Educational Research*, **22**(8): 376–390.

Koh, J.H.L., Chai, C.S., Wong, B. and Hong, H.Y. 2015. Design Thinking for Education. In *Springer e-Books*. https://doi.org/10.1007/978-981-287-444-3

Kumar, K. 2005. *Political agenda of education: A study of colonialist and nationalist ideas* (2nd ed). Sage Publications.

Meinel, C., Leifer, L. and Plattner, H. 2011. Design Thinking. In *Springer e-Books*. https://doi.org/10.1007/978-3-642-13757-0

Miró, A.P. 2020. World Economic Forum: present and future. *Dimensión Empresarial Dimensión Empresarial*, **18**(2).

Mukherjee, R. 2024. *A View from India: Our Approach to Continuous Professional Development for Teachers*. Cambridge International Education Blog. https://blog.cambridgeinternational.org/a-view-from-india-our-approach-to-continuous-professional-development-for-teachers/

National Policy on Education. 2024, April 30. Wikipedia. https://en.wikipedia.org/wiki/National_Policy_on_Education

Nayak. 2018. *An antidote to rote learning*. Forbes India. https://www.forbesindia.com/blog/economy-policy/an-antidote-to-rote-learning/

Nic, L.P. (n.d.). *Major Initiatives | Government of India, Ministry of Education*. https://www.education.gov.in/

Panke, S. 2019. Design Thinking in Education: Perspectives, Opportunities and Challenges. *Open Education Studies*, **1**(1): 281–306.

Plattner, H., Meinel, C. and Leifer, L. 2012. Design Thinking Research. In *Springer e-Books*. https://doi.org/10.1007/978-3-642-21643-5

Razzouk, R. and Shute, V. 2012. What Is Design Thinking and Why Is It Important? *Review of Educational Research*, **82**(3): 330–348.

Resource Constraints in Implementing the NEP 2020. (2022, February 9). Economic and Political Weekly. https://www.epw.in/engage/article/resource-constraints-implementing-nep-2020

Rowe, P.G. 2017. *Design Thinking in the Digital Age*. Sternberg Press.

Wiggins, G. and McTighe, J. 2005 Understanding by design (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development ASCD. *Colombian Applied Linguistics Journal/Colombian Applied Linguistics Journal*, **19**(1): 140.

Seidel, V.P. and Fixson, S.K. 2013. Adopting Design Thinking in Novice Multidisciplinary Teams: The Application and Limits of Design Methods and Reflexive Practices. *The Journal of Product Innovation Management*, **30**(S1): 19–33.

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J.M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., Hayek, S.E., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D. And Lubart, T. 2023. Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, **11**(3): 54.

Trilling, B. and Fadel, C. 2009. *21st Century Skills*. John Wiley & Sons.