

Re-imagining Education Policy of a Framework Based on Indian Knowledge Systems

Nagendra Singh^{1*}, Saurabh Pachauri², Manish Dixit³

Abstract

Digital transformation revolutionized education; it enhances teaching and learning, improves administrative tasks, and empowers students and educators. Digital transformation in education and its importance in shaping the future. Integration of technology in classrooms enables interactive and immersive learning. Digital tools offer dynamic learning experiences, enhancing student engagement. This leads to improved comprehension and knowledge retention. Personalized learning experiences are facilitated by digital transformation. Digital transformation creates vast resources and online libraries, making knowledge accessible to all students regardless of location. Inaccessible information and resources are now easily accessed, enabling students to conduct research and broaden horizons. Knowledge has made education more inclusive, bridging the gap between students from diverse backgrounds. Digital transformation has optimized efficiency in educational institutions. Education 2.0 advocates a student-centered, technology-driven, experiential approach as a visionary framework for educational revolution. The main tenets, opportunities, and difficulties of Education 2.0 are examined in this abstract. Education 2.0 shifts focus to students, acknowledging current system flaws. Framework aims to foster love of learning, equip students with skills for changing environment. With personalized learning paths, students control their education speed. Technology enables global cooperation and interactive experiences. Experiential learning bridges theory with practical skills. Despite challenges, Education 2.0 faces implementation difficulties due to opposition, lack of resources, and need for teacher preparation. Collaborative efforts are required from educators, governments, parents, and communities to overcome these obstacles. It offers producing caring global citizens prepared for a changing world through innovation, adaptation, and empowering learners. Education 2.0 in the future calls for a collaborative commitment from students as active architects of their own knowledge and wisdom. The Research paper focuses on the role of Project-based learning and experiential learning approaches in the changing educational system worldwide. Both are influential strategies to provide practical learning from real experiences to students. Both approaches are increasingly used by teachers and students. This paper investigates collaborative works on different subjects along with technological intervention to identify existing knowledge and needs.

*Author for Correspondence

Nagendra Singh
E-mail: singh.mech2008@gmail.com

¹Assistant Professor, Department of Mechanical Engineering, Institute of Engineering and Technology, Khandari Campus, Agra, Uttar Pradesh, India

²Assistant Professor, Department of Mechanical Engineering, Institute of Engineering and Technology, Khandari Campus, Agra, Uttar Pradesh, India

³Assistant Professor, Department of Mechanical Engineering, Institute of Engineering and Technology, Khandari Campus, Agra, Uttar Pradesh, India

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INTRODUCTION

Education shapes individuals and societies, providing knowledge, skills, and values for progress. Traditional education faces challenges in a rapidly changing world with technological advancements, economic shifts, and evolving societal norms. India, with a growing young population, faces these challenges. Hence, there is

an urgent need to re-imagine education for the 21st century. Chapter presents framework for transforming education in India. Includes innovative approaches to curriculum, pedagogy, assessment, teacher training, technology, inclusivity, and community engagement [1].

National Educational Policy 2020 recommends incorporation of Indian Knowledge System into curriculum at all levels. India has a rich and diverse knowledge heritage spanning thousands of years. Ancient educational system rooted in philosophical, spiritual, and scientific principles laid foundation for intellectual, cultural, and societal progress. There is growing recognition of integrating India's traditional knowledge into modern education for holistic, inclusive, and transformative learning. This chapter explores a framework for educational transformation based on Indian knowledge system principles. Research paper focuses on Project-based and experiential learning in the changing educational system worldwide. Both approaches are influential strategies for practical learning from real experiences. PBL and experiential learning integrated into school curriculum for future practices. Increasingly used by teachers and students. Investigates collaborative works on subject matters with technological intervention to identify knowledge gaps [2].

During COVID-19, teaching shifted to online learning. Technology enabled this transition. This paper explores the importance of technological intervention. Educators now use technology for assessment.

Project-based and experiential learning are distinctive ways of learning, highly interconnected and independent. Project-based learning is a modern teaching method that connects real-life experiences with education. This approach believes in acquiring new knowledge through personal efforts through projects. It focuses on learning processes to develop students' thinking, creating, presenting, and acquiring new knowledge [3].

Experiential learning is crucial in this era of change in teaching and learning. It emphasizes observation, interaction, and experiments in educational settings. It helps develop learning strategies, perceptual skills, and creative thinking that are uncommon in traditional methods. This learning method allows students to explore their personal interests through beneficial discoveries and experiments.

The 21st century is characterized by digitalization, technology, and change impacting the entire educational setting. Following the National Education Policy 2020, the Indian education system now emphasizes competency based learning over content-centric education. This shift helps students understand concepts better by actively engaging with them and relating them to real scenarios [4].

Various learning approaches can be implemented in the educational system. Project-based and experiential learning are being adopted by Indian educational system to improve student outcomes. Teacher training and resources are essential. The delivery of education globally is now limited by technology. This shift has caused issues with teachers and students adapting to e-learning. Technology combined with PBL and experiential learning can help both teachers and students adjust to educational changes. The digital age is characterized by widespread adoption of digital technologies in society. It began in the late 20th century with advancements in computers, the internet, and mobile devices. The digital age transformed education, changing how we learn, teach, and engage with knowledge. Technology like computers, tablets, smart phones, and the internet is now essential in modern society and has greatly impacted education. This digital revolution has transformed education, creating new possibilities and challenges. Educational technology integrates diverse digital tools to enhance teaching and learning. These include whiteboards, multimedia content, web portals, and virtual classrooms, technology enhances education beyond time and space. Design thinking is a creative sector aiding in problem-solving with innovative solutions. It is a new sector that combines logic, creativity, reasoning, and intuition to solve clients' problems effectively. Design thinking originated in the 1970s but gained focus in the early 2000s due to the work of Tim Brown, CEO of IDEO. Brown and team saw the need for DT in business to foster innovation by integrating closely with other design firms. Human

experience is the key in Design Thinking, known as Human-Centered Design. In the 21st century, the advanced economy requires workforce skills, highlighting ambiguous and difficult skills and revealing their meaning. Education now emphasizes critical thinking, collaboration, problem solving, and innovation [5].

This shift aligns skills with standardized assessments and professional certification. In addition to the above, Design thinking helps designers solve complex problems by collaborating to find innovative solutions for customers. Design thinking is used in Healthcare, Agriculture, Food Safety, Education, Financial Service, and Environment Sustainability. Design Thinking contributes to developing digital technology, creating physical goods, and stimulating social innovation projects. Student-Centric Teaching, also known as Learner-Centered Teaching, places the student at the center of the learning process. With this strategy, the focus shifts from teacher-led model to customized educational process for specific students that includes Active Learning, Individualized Learning, Critical Thinking, Self Problem Solving, Interest, and Relevance, Use of Latest Technology, Real-world Relevance, Autonomy, Collaboration, and more. The main goal of SCT is to actively involve students in their learning to enhance understanding and retention. SCT empowers students, fosters lifelong learning, and prepares them for success in a changing environment. It emphasizes critical thinking, problem-solving, and a genuine love of learning alongside knowledge transmission [6].

RE-ENVISIONING THE CURRICULUM FOR HOLISTIC DEVELOPMENT

The foundation of educational transformation is re-envisioning the curriculum. Conventional curricula focus on rote memorization and content-based learning, which doesn't prepare students for the modern world. A re-imagined curriculum should emphasize interdisciplinary learning, critical thinking, problem-solving, creativity, emotional intelligence, and practical application. Subjects like coding, environmental studies, and ethical reasoning broaden students' perspective and skill set. Innovative pedagogical methods are crucial for meaningful engagement and deep understanding. Experiential learning, involving hands-on projects and real-world simulations, encourages active participation. Collaborative learning environments enhance teamwork, communication, and problem-solving skills. Moreover, technology integration enhances engagement and empowers students [7]. Assessment influences teaching practices and learning outcomes. Examination-centric methods prioritize memorization over comprehension and critical thinking. To support holistic growth, education needs continuous and comprehensive assessment. Portfolios, presentations, projects, and self-assessments offer insights into students' progress. Evaluating subject knowledge and skills like critical thinking and collaboration mirrors real-world demands. Teachers shape students' educational experiences. Empowering educators with modern teaching skills and tools is essential. Teacher training programs should focus on innovative pedagogies, technological integration, classroom management, and emotional intelligence. Continuous professional development, mentorship, and peer learning foster growth among teachers [Figure 1]. Educators must navigate changes effectively in transforming education [8].

Technology revolutionizes how we interact with the world and access information. Education must go beyond adopting technology to cultivating digital literacy. Digital literacy involves critically evaluating, ethically navigating, and using technology for learning and communication. Initiatives like "One Student, One Device" program and digital literacy training bridge digital divide, empower learners. Inclusive education system values diverse learning needs. Personalized learning pathways accommodate different styles and paces. This approach supports individual differences and encourages students to own their learning journey. Specialized support for students with disabilities and awareness campaigns promote diversity and equity. Education shapes communities and societies beyond the classroom. Partnerships with local industries, organizations, institutions, and leaders enhance learning experiences. Internships and projects allow students to apply knowledge, fostering social responsibility. Physical environment impacts student experiences. Modern classrooms should promote various teaching methodologies and collaborative activities. Sustainable infrastructure and innovative

technologies foster environmental awareness. Well-equipped libraries and recreational areas support holistic development [9] [Figure 2] (Table-1)

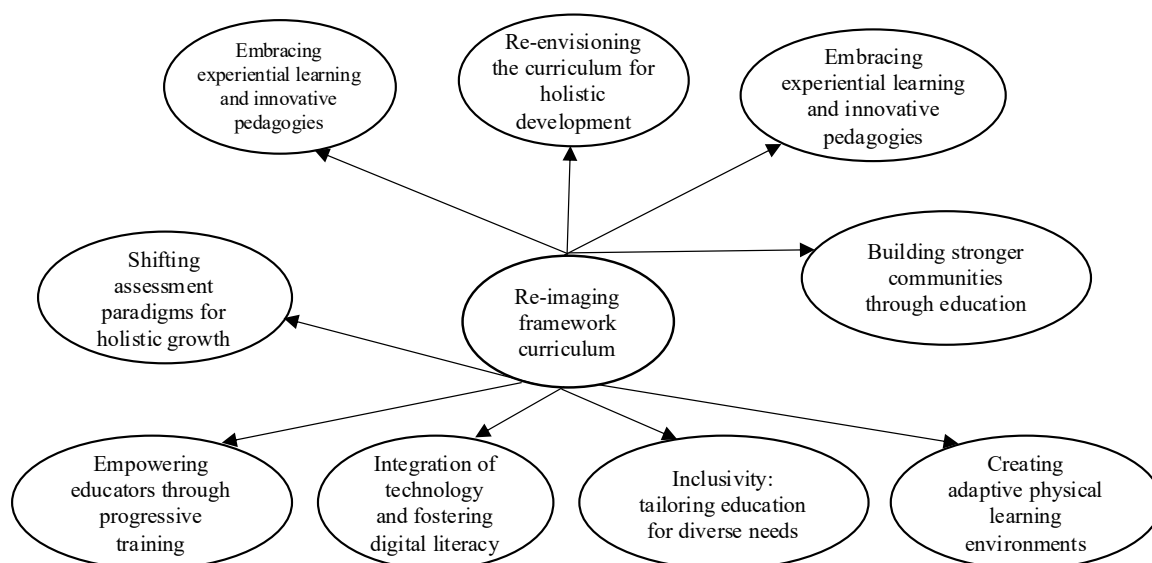


Figure 1. Re-imagining framework curriculum.

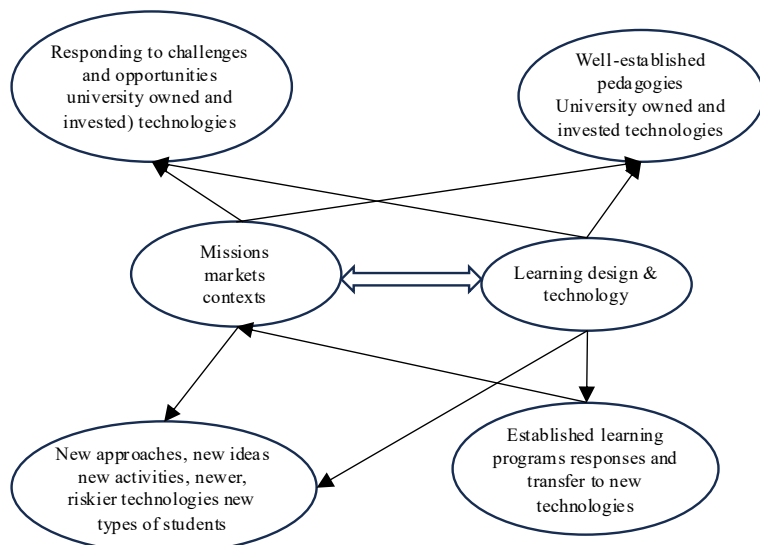


Figure 2. Lack of institutional learning approach.

Table 1. Professional responsibilities in educational transformation.

S.N.	Transformation processes	Responsibilities
1.	Embracing holistic education	The Indian knowledge system values holistic education nurturing mind, body, and spirit. Education goes beyond transmitting information; it aims to develop a well-rounded individual with critical thinking, empathy, and moral reasoning. Integrating yoga, meditation, and mindfulness in curriculum can help students cultivate emotional intelligence, self-awareness, and well-being.
2.	Integrating practical and theoretical knowledge	Traditionally, Indian education values theoretical and practical knowledge integration. Modern education can adopt this by providing experiential learning, internships, and project-based assessments. By connecting theory to real-world applications, students gain deeper understanding and better prepare for complex challenges.

3.	Fostering interdisciplinary studies	The Indian knowledge system promotes interdisciplinary studies, recognizing interconnectedness of knowledge fields. Implementing this approach in education can promote creativity, lateral thinking, and diverse perspectives exploration. For instance, science with traditional arts, history with technology, and spirituality with environmental studies offer a comprehensive educational experience.
4.	Emphasizing guru-shishya tradition	The Guru-Shishya tradition is integral to Indian knowledge. Transformative education can leverage this by fostering strong relationships. Encouraging mentorship and guidance fosters personalized learning, where educators grasp each student's unique needs and aspirations.
5.	Promoting ethical and moral values	Ethics and moral values are central in Indian knowledge system. Value-based education can instill integrity, compassion, and social responsibility in students. By emphasizing character development with academic achievement, the educational transformation aligns with nurturing responsible citizens.
6.	Respecting diversity and inclusivity	India known for cultural and linguistic diversity. Educational transformation must celebrate diversity and promote inclusivity. By including regional languages, literature, and art in the curriculum, students can appreciate their heritage and respect different cultures.
7.	Balancing tradition and innovation	An effective framework for educational transformation balances tradition and innovation. While valuing past wisdom, it also incorporates modern science and technology. By using modern tools, educators can create dynamic learning environments to prepare students for a changing world.
8.	Transformative framework for learning innovation	The Indian knowledge system enriches modern education and enables transformative learning. By embracing holistic education, integrating practical and theoretical knowledge, fostering interdisciplinary studies, emphasizing the Guru-Shishya tradition, promoting ethical values, respecting diversity, and balancing tradition with innovation, India can create an educational system that nurtures enlightened individuals. As country progresses, it must use heritage to shape education for youth to navigate future wisely.
9.	Professional responsibilities	Four domains: Planning and Preparation, Classroom Environment, Instruction, and Professional Responsibilities. Educators and institutions play a crucial role in educational transformation. As educators shape future minds, their responsibilities are significant. This chapter explores principles and ethics in the "Framework for Educational Transformation. "By aligning actions with principles, educators can pave the way for a holistic educational system that empowers learners in an ever-changing world.
10.	Nurturing inclusivity and diversity	At the core of educational transformation is a commitment to inclusivity and diversity. Educators must create a respectful environment that celebrates differences in various aspects. They should ensure every student feels safe, valued, and represented in learning process. Through inclusive teaching and diverse curricular content, educators foster belonging, break barriers, and cultivate empathy among learners.
11.	Fostering lifelong learning	Educational transformation goes beyond classroom boundaries. Educators need to instill a passion for lifelong learning in learners. Educators should model continuous personal and professional development. Staying updated on research, technology, and pedagogical approaches helps adapt teaching methods to student needs. In this way, educators create lifelong learners with skills to thrive in a dynamic world.
12.	Empowering student agency	Transformed framework empowers learners in learning journey. Educators must empower students to make decisions, set goals, and take ownership of their learning. By offering choices and encouraging inquiry-based approaches, educators nurture critical thinking, creativity, and problem-solving skills. This emphasis on student agency enhances academic outcomes and prepares learners for a future where adaptability and autonomy are vital.
13.	Ethical use of technology	In digital age, technology is crucial for educational transformation. Reliance on technology comes with responsibility to use it ethically. Educators teach learners about digital citizenship, privacy, and online actions' consequences. Educators must use technology respecting learners' data privacy and balancing online and offline learning.
14.	Cultivating emotional intelligence	Educational transformation goes beyond imparting knowledge; educators must also focus on learners' emotional well-being. Cultivating emotional intelligence means creating a safe environment for learners to express and understand their emotions. This approach boosts mental health and improves social skills, empathy, and resilience.
15.	Collaborating for systemic change	The pursuit of educational transformation goes beyond classrooms and schools, requiring collaboration among educators, administrators, policymakers, parents, and the broader community. Educators should engage in professional learning communities to share best practices and collaborate on addressing education challenges. By collaborating, educators can

		influence policy decisions, advocate for change, and contribute to an equitable educational system.
16.	Assessing holistically	In educational transformation, assessment approaches must evolve. Educators should shift from standardized tests to a holistic system. Evaluating students' progress through project-based assessments, portfolios, peer evaluations, and self-assessments. Holistic assessment sees learning as multifaceted, offering a comprehensive view of students' abilities and areas for improvement.
17.	Emphasizing sustainable practices	As educators guide students towards a sustainable future, they must model sustainable practices. They should promote eco-friendly practices in the school community by incorporating environmental consciousness into teaching and operations. Encourage recycling, reduce waste, conserve energy, integrate sustainable development into curriculum. By promoting environmental responsibility, educators can inspire the next generation to be planet stewards.
18.	Cultivating critical thinking	In a world full of information, educators must develop critical thinking skills in students. Encouraging students to question, analyze, and evaluate information develops intellectual curiosity and helps them distinguish reliable sources from misinformation. Critical thinking empowers students to approach challenges with a discerning eye, helping them become well-informed citizens.
19.	Promoting ethical leadership	Educational transformation needs ethical leadership at all levels. Principals, administrators, and teachers should demonstrate ethical values and integrity, serving as role models for students. Ethical leadership prioritizes well-being of students and community over personal gain. By showing ethical behavior, educators instill values in students, shaping a society guided by ethical principles.
20.	Encouraging global citizenship	In interconnected world, educators nurture global citizens who appreciate diverse cultures and perspectives beyond borders. By including global issues and promoting cross-cultural understanding, educators can prepare students to be responsible global citizens. Emphasizing empathy, cultural competence, and collaboration, educators help students address global challenges and promote peace.

Reflecting on Practice

Continuous improvement is key in educational transformation. Educators must reflect and develop to enhance teaching practices. By evaluating methods, seeking feedback, and being open to innovation, educators can refine instructional strategies to better meet diverse student needs.

The previous overselling and exaggerated claims from commercial providers shifted academics' focus to learning technology attributes rather than pedagogical assumptions, potential, and value for development, achievement, and quality improvements. Further, mobile devices and social media can be used for educational adoption, but universities lack learning from isolated experiments due to internal systems. In the "Framework for Educational Transformation," professional responsibilities drive positive change through inclusivity, lifelong learning, student agency, ethical technology use, emotional intelligence, and collaboration. Educators can create a transformative educational experience by nurturing these tools. Through dedication, educators unlock potential and shape a brighter world [10].

Professional responsibilities guide educators in transforming education to create impactful learning experiences for each student. By nurturing inclusivity, fostering lifelong learning, empowering student agency, using technology ethically, cultivating emotional intelligence, collaborating for systemic change, assessing holistically, emphasizing sustainable practices, cultivating critical thinking, promoting ethical leadership, encouraging global citizenship, and reflecting on practice, educators can transform education for the better. Through commitment to principles, educators create brighter, more equitable, and sustainable future [11].

CRITICAL ROLE OF PROJECT BASED AND EXPERIMENTAL LEARNING APPROACHES

Project-based Learning Approach

Project-based learning is a significant educational approach where students collaborate on real world problems. Students apply knowledge, skills, and abilities through projects or tasks. This method

engages students in classroom activities, allowing them to solve problems, acquire skills, and master concepts. It also improves communication skills. Project-based learning is a popular teaching method worldwide. It provides systematic learning instructions to students by the teacher. Student-centric learning approach. Measures teaching effectiveness and helps students self-monitor actions and abilities. This method bridges academic and real-life experiences for students to explore differences. Project-based learning prepares students with authentic skills for the future. Students become empowered to take ownership of their studies and apply knowledge effectively. The COVID-19 crisis led to a focus on e-learning in education. Technology and projects are key to academic success. By doing real problem projects, students learn relevance and apply skills. They design, plan, and execute projects independently, promoting responsibility. Inculcates interpersonal skills for effective project completion [12] [Figure 3].

Benefits of Project-based Learning Approach

PBL motivates students to connect with the curriculum, increasing knowledge. It helps develop interest in various subjects and sparks love for learning. Through learning mode, students face education realities. Projects improve student learning and academic outcomes. It facilitates a transformation in the educational outcomes of students by actively engaging them in a variety of activities and tasks, particularly those who are deprived of academic opportunities due to diverse socio-economic constraints. Project-based learning enhances students' listening skills as well as their creative capacities. PBL is a collaborative learning method that promotes social skills among students by encouraging cooperation, negotiation, and accountability for individual or group work. They reflect on their performance in collaborative tasks and contributions made. PBL develops thinking capacity to self-evaluate projects and efforts. It aids in forming judgements, opinions, and critical thinking. Students identify their strengths and weaknesses. Project-based learning promotes critical and divergent thinking over traditional methods [13].

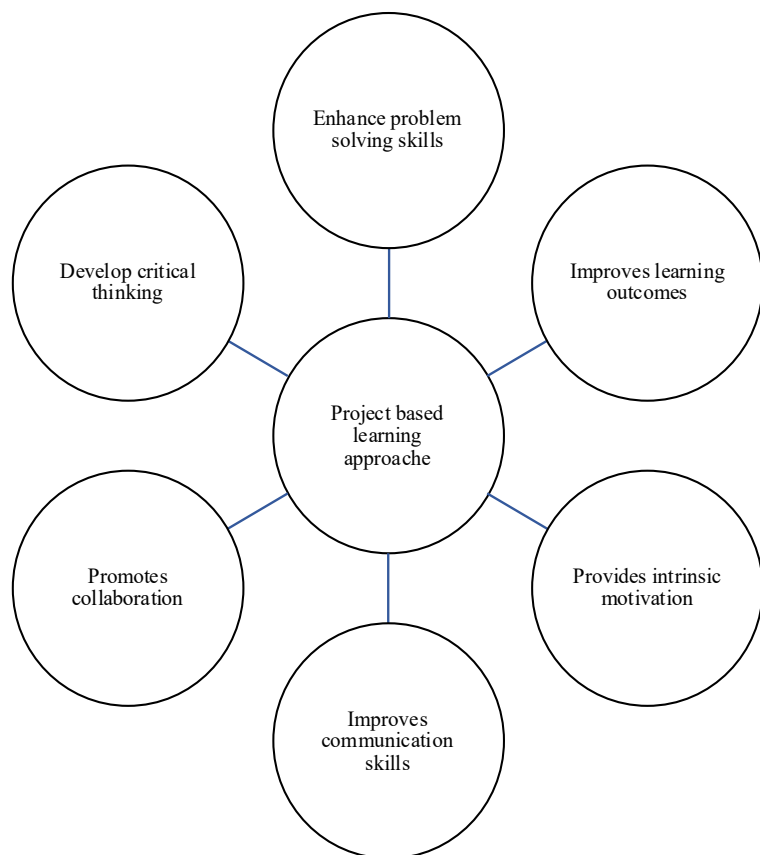


Figure 3. Project based learning approach.

PBL shows students real life challenges, helping them realize their capabilities and problem-solving skills. Solving problems is a skill students must acquire for analyzing and solving new problems effectively. These skills involve various strategies that prepare students for future practices. It elevates their self-esteem to unprecedented heights. Project-Based Learning (PBL) facilitates an enriching exchange of ideas, thoughts, and perspectives among students within a collaborative group setting, which significantly enhances their communication skills. It promotes peer accountability leading to positive project outcomes in Figure 3. They acquire crucial communication skills essential for project-based learning.

Experiential Learning Approach

Experiential learning engages students' day-to-day experiences with academic discourse, focusing on learning by doing and through experiences. Dewey popularized rejecting rote learning, emphasizing critical thinking. Experiential learning involves students and their experiences. Experiential learning designs the educational environment for students to engage with their direct experiences and connect real world with classroom activities. Unlike traditional approaches, experiential learning offers an alternative to classroom instructions that focus on competition rather than motivation or interest. John Dewey believes education is about reconstructing experiences, with the process and goal being the same. However, for meaningful learning, students must participate in experiments without teacher intervention. COVID-19 challenges led to online learning, hindering hands-on learning and direct communication opportunities for students. Despite that, experiential learning transforms traditional learning, reinforcing dynamic skills. Students enhance learning strategies and skills through new experiments. It encourages positive attitudes, values, and beliefs in students and facilitates intellectual power. Experiential learning offers opportunities to broaden view of world, insight of own abilities, collaborative skills, understanding of learning materials, self-confidence, and management skills. Personal development results and forms basis for future experiences [14].

Benefits of Experiential Learning Approach

Experiential learning captivates students intellectually, physically, and socially, immersing them in authentic tasks that facilitate genuine learning. This approach enables them to grasp how to translate theoretical concepts into practical applications, fostering their personal and professional growth. Through this pedagogical method, a comprehensive development of the student is assured. It encompasses the holistic development of a child by nurturing qualities, such as empathy, adaptability, resilience, innovation, and creativity. Experiential learning cultivates connections among students, their classroom experiences, and the broader world, enabling students to reflect on their choices of endeavors. Experiential learning represents an innovative pedagogical approach that actively engages students in exploration, experimentation, analysis, problem-solving, inquiry, and the construction of meaning. This form of learning cultivates collaboration, communication, teamwork, and observational skills, thereby enhancing learners' capacity for multitasking. Through experiential learning, individuals will uncover innovative strategies to navigate the complexities of the real world. This approach allows students to receive constructive feedback on their endeavors from their educators or instructors, enabling them to critically assess their own errors and implement the remedies suggested by their mentors [15].

A Brief Difference of Project-based Learning and Experiential Learning Approaches

Project-based and Experiential learning are core ideas in modern education to bridge students' school life with social, emotional, and cultural needs. It enables integrated learning with technology, vocational education, special education. Both approaches are similar in motivating students, developing critical thinking, problem-solving, collaborating, communication, self-evaluating skills. Although project-based and experiential learning are similar, they have differences. Project-based learning is interdisciplinary and goal-focused. In project-based learning, teachers assume the role of facilitators, engaging collaboratively with students to design meaningful tasks. Furthermore, within this pedagogical approach, educators encounter challenges related to technology and financial considerations, as they must adeptly manage these aspects prior to instructing their students. Projects stimulate innovative thoughts in students by identifying a variety of solutions without limitations on

information. Educators no longer appreciate rote-learning as it makes students less active in their learning. Therefore, project-based learning is recognized as the most effective method for imparting profound knowledge of one's field of study. In contrast, experiential learning represents an autonomous approach that encompasses a diverse array of methodologies and avenues for acquiring knowledge. It integrates learning through projects. It underscored the significance of students' direct experiences that cultivate their diverse abilities and skills to observe and unearth new insights. Experiential learning is renowned for its hands-on engagement, allowing students to immerse themselves in practical experiences. In this method, teachers motivate students to learn through experiments. Students apply observational, time management, and self-monitoring skills during experiments. Experiential learning shifts education from teacher-centric to child-centric approach, allowing students to choose fields for higher studies and prepare for future expectations [16].

ROLE OF TECHNOLOGY IN EDUCATIONAL CHANGE THROUGH PROJECT-BASED AND EXPERIENTIAL LEARNING APPROACHES

Technology has emerged as a formidable instrument for the implementation of instructional learning. The amalgamation of technology with project-based and experiential learning fosters heightened efficacy within contemporary educational environments, enabling them to adeptly navigate the evolving landscape of education. These approach combines teaching with technology [17]. It marks a departure from traditional education to progressive education. Schools need to redesign curriculum for teachers to be more effective. To improve student performance, blended instruction is now core in planning classroom activities. COVID-19 forced a transition from traditional to technological learning, creating challenges for educators and students. At the time of COVID-19 emergency, students, and education faced pedagogical, technical, and psychological challenges. Sudden change in instructions made them realize the need for technology. But as schools return to normal, teaching-learning processes accelerate with technological learning. Technology helps teachers create project-based learning involving students, families, and administrators. Students explore their experiments, discoveries, and innovations. Technological resources enhance assessment reliability. Shared vision among educators is crucial for implementing new teaching methods. Technology in education allows for personalized learning and student choice. Technology brings online learning platforms to learners worldwide, allowing less experienced individuals to participate in specialized courses and communities, becoming active members. It supports teaching by connecting with larger global communities [18].

ROLE OF EDUCATORS IN THE DIGITAL AGE

Significance of Redefining Educators' Roles

The importance of redefining educators' roles in the digital age is crucial. Technology growth has rendered traditional teaching methods outdated for modern learners. Educators must embrace technology to create engaging learning environments tailored to individual student needs. Personalized learning enables educators to adjust instruction to match each student's proficiency level. Technology enables collaborative learning and interactive discussions, preparing students for the future with essential skills like digital literacy and critical thinking. As educators exemplify the significance of lifelong learning through ongoing professional development, students are motivated to cultivate curiosity and adaptability, thereby positioning themselves to flourish in the perpetually evolving digital landscape. Finally, reimagining the roles of educators constitutes a pivotal step toward cultivating a robust educational framework that equips students with the requisite skills and mindset essential for thriving in the digital epoch [19].

Changing Landscape of Education in the Digital Age

The digital age brought digital transformation to education. Technology integrated into education reshapes learning delivery and experience. Traditional classrooms are becoming technology-enhanced, with digital tools complementing traditional teaching methods. Technology integration in the classroom drives digital transformation in education. Educators must utilize digital tools like whiteboards, tablets, laptops, and projectors to enhance teaching. These technologies enable dynamic presentations, engage students with multimedia content, promote collaboration, and provide access to online resources. Again,

digital age shifts towards blended and online learning. Blended learning combines face-to-face with online, allowing own pace. Online learning enables access to educational content and remote interaction with instructors. These models cater to diverse learning preferences, allowing students to access education beyond traditional boundaries. Educational technology tools have proliferated in the digital age, transforming the teaching and learning experience. Learning management systems (LMSs) are central for educators to manage course content, track student progress, and administer assessments. Virtual classrooms and video conferencing are essential for synchronous online learning, enabling real-time interactions between educators and students [20].

Evolving Student Demands and Needs

Students in the digital age are called “digital natives” as they grew up surrounded by technology. They have a natural familiarity with digital devices, online platforms, and social media. As digital natives, their learning preferences differ significantly from previous generations. They prefer instant access to information, interactive content, and constant connectivity. Educators must understand digital natives to engage them effectively. Digital literacy is essential for today’s learners. It involves navigating, evaluating, and effectively using digital technologies. Students need skills to discern credible sources and understand ethical implications of their digital actions. Moreover, digital citizenship is crucial in the digital age. It involves responsible and ethical behavior online. Educators are key in teaching students about online safety, privacy, and respectful communication. Promoting good digital citizenship by educators empowers students to be responsible and respectful digital citizens who contribute positively to online communities and society. Finally, understanding digital natives’ evolving demands is essential for educators to cater effectively to their learning preferences and foster engaging educational experiences. Equipping students with digital literacy skills and promoting digital citizenship prepares them to navigate the digital world responsibly and ethically, empowering them to become active participants and responsible global citizens [21].

Traditional Educator Roles Versus New Paradigms Traditional Roles of Educators

In traditional education, educators deliver content and transmit knowledge. They present information to students during lectures. Emphasis is on disseminating information to learners, often using a one-size-fits-all approach. However, in the digital epoch, access to information has undergone a profound transformation due to the internet, rendering the role of educators in content delivery increasingly dynamic. The proliferation of digital resources and online platforms has compelled educators to evolve from mere purveyors of information to adept curators and facilitators of knowledge. Also, educators maintained order and discipline in the classroom by setting rules, managing behavior, and ensuring a conducive learning atmosphere. Classroom management focused on control and creating a structured environment. In digital age, classroom management includes online interactions and digital etiquette. Educators teach responsible digital citizenship and online behavior. They foster positive digital learning culture, encouraging respectful communication and ethical conduct. Assessment in traditional model relied on standardized tests and summative evaluations to measure students’ learning outcomes. Grading focused on assigning scores to quantify performance, often emphasizing memorization and regurgitation of facts. In digital age, assessment, and grading are now more formative, authentic, and learner-centered. Educators must use diverse assessment methods beyond traditional tests to evaluate students’ skills and knowledge application. Formative assessments guide students’ learning progress, identify areas for improvement, and support personalized pathways. Emphasis is on assessing critical thinking, problem-solving, collaboration, and future-ready skills for the digital era [22].

Emerging Roles of Educators in the Digital Age

In the digital age, educators need to shift from instructors to facilitators of learning, guiding students in discovery, exploration, and active engagement with the material. The main role of facilitators is to promote a student-centered approach, encourage critical thinking, problem-solving, and collaborative learning, and create interactive and inquiry-based learning experiences that promote curiosity and independent learning. In digital age, educators use technology for interactive activities and discussions to help students learn. Digital information offers opportunities and challenges for students. Educators

choose digital content to support students' learning objectives. In the digital age, educators focus on holistic student development. The educators' role extends beyond academic content to provide guidance in developing life skills like communication, collaboration, and adaptability. Students' well-being is nurtured, encouraging a growth mindset for resilience and facing challenges. As mentors, educators provide personalized feedback, encouragement, and emotional support to empower students to reach their full potential. Technology helps educators maintain ongoing communication with students, creating opportunities for meaningful mentorship beyond the physical classroom [23].

Embracing Technology as an Enabler, Not a Replacement

Technology has emerged not merely to disrupt but to enrich the human connection between educators and students. Educators assume a pivotal role in fostering profound relationships with their students and cultivating a nurturing learning environment. In actively engaging with students by demonstrating authentic concern and exhibiting a profound interest in their well-being and academic progression, educators cultivate trust and rapport that nurtures a constructive learning environment. While technology can enhance communication and collaboration, the human touch remains indispensable in comprehending individual needs, furnishing tailored support, and fostering a sense of belonging within the educational community. Virtual reality and augmented reality present immersive educational experiences that transcend conventional classroom environments. VR immerses students in virtual realms, allowing them to investigate historical landmarks, scientific phenomena, or meticulously simulated real-life scenarios. AR overlays digital content in the real world, enriching learning with interactive elements. Educators play a vital role in contextualizing and debriefing these encounters. Human touch ensures students connect virtual experiences with real-world knowledge. Blended learning combines face-to-face instruction with online components. This offers flexibility and customization for diverse learning preferences and schedules. Educators can leverage technology to deliver engaging online content, facilitate asynchronous discussions, and offer self-directed activities while preserving the invaluable essence of in-person interactions. In the blended learning paradigm, the human element becomes more deliberate and strategically orchestrated, with educators adeptly guiding students through digital resources and providing essential support and enrichment during face-to-face engagements [24].

Developing Digital Literacy and Technological Proficiency in Educators

Professional development is crucial for educators to embrace the digital age and enhance digital literacy and technological skills. Technology advancements mandate educators to constantly update their skills for effective technology integration in teaching. Professional development helps educators overcome technological barriers and fears. Some educators feel overwhelmed by rapid changes or lack confidence in using new tools. Through specialized training and comprehensive support, educators can cultivate the confidence necessary to surmount these challenges and embrace technology as a transformative instrument. Professional development initiatives can focus on augmenting educators' digital literacy competencies, encompassing information literacy, media literacy, and digital communication. In this context, educators acquire the ability to critically assess digital content, leverage digital resources, and engage in effective communication within digital environments. The digital age poses challenges with cyberbullying and online safety. Educators promote responsible technology use and a safe digital learning environment. Students should learn about cyberbullying consequences, promoting empathy and respectful online communication. To adeptly confront the multifaceted challenges of cyberbullying and online safety, while fostering a culture of digital kindness and accountability, educators, and educational institutions must establish unequivocal policies and guidelines. With the rise of digital information and media, promoting media literacy is crucial. Students must develop critical thinking skills to evaluate digital content. Teaching students to discern credible sources, fact-check information, and recognize misinformation and disinformation helps them become responsible digital citizens [25].

Assessing and Measuring the Impact of Redefined Educator Roles

In the digital era, conventional assessment methodologies fail to comprehensively encapsulate the extensive spectrum of students' knowledge and competencies. The redefined roles of educators necessitate the implementation of authentic and performance-oriented assessment strategies. These methodologies evaluate students' competencies within authentic contexts and emphasize the application of knowledge and problem-solving skills rather than mere rote memorization. Performance-based assessments, encompassing projects, portfolios, and simulations, empower students to manifest their comprehension and skills in profound and meaningful ways. Considering this, educators can leverage technology to meticulously design, administer, and evaluate these assessments, thereby offering a holistic perspective on students' progress and accomplishments. The integration of technology enables educators to deliver continuous feedback and facilitate formative assessments throughout the educational journey. Formative assessments are continuous and diagnostic in nature, enabling educators to discern students' strengths and weaknesses and to adapt their instructional strategies accordingly. Technology tools help educators monitor student performance, give feedback, and adjust instructional strategies in real-time. Continuous feedback and formative assessment cultivate a dynamic and responsive learning environment, thereby enhancing student learning outcomes [26].

Evaluating Educator Success in the Digital Age

In the digital era, the evaluation of educator efficacy transcends conventional metrics, such as standardized test scores. The influence of educators is gauged through the lens of student outcomes and accomplishments across a myriad of learning domains. Student advancement in the acquisition of critical thinking, problem-solving, creativity, collaboration, and other competencies essential for future success is paramount. Technology-enhanced learning environments facilitate the meticulous collection of comprehensive data regarding student performance, empowering educators to monitor individual progress and discern areas necessitating enhancement. The efficacy of an educator's pedagogical strategies can be evaluated through a comprehensive analysis of student outcomes, which enables educators to refine their methodologies to foster student achievement [27]. The ongoing professional growth and development of educators are paramount to their effectiveness in the digital era. Evaluating the growth of educators transcends conventional professional development workshops and encompasses a continuous journey of learning and the seamless integration of technology into pedagogical practices. Educators are urged to engage in technology-centric training, attend conferences, and collaborate with colleagues to elevate their technological proficiency and refine their instructional methodologies. Reflective practices, self-assessment, and peer evaluations serve as invaluable tools for educators to discern areas necessitating enhancement and to establish objectives for ongoing development in the digital era [28] [Figure 4].

APPLICATION IN EDUCATIONAL INNOVATION

Design Thinking – a Six-step Process

Design Thinking can be perceived as an iterative, non-linear methodology delineated across six distinct phases: 1. Empathize Phase, 2. Define Phase, 3. Ideate Phase, 4. Prototype Phase, 5. Testing Phase, and 6. Implementation Phase, as illustrated in Figure 4.

Empathize – Analyze and Understand the Needs of the User

For human-centered design methodologies, such as design thinking, the cultivation of empathy is paramount [29]. It enables designers to transcend their own preconceptions about the world and to attain genuine insights that resonate with the authentic needs of users. It involves the deliberate act of setting aside the designer's requirements, cognitive frameworks, and preconceived notions to adopt another's perspective. In a similar vein, design thinking aspires to comprehend individuals' emotions and genuine needs, as well as the motivations behind their behaviors and what holds significance for them. Therefore, designers ought to engage with specialists, observe diligently, immerse themselves in the user's environment, and experience the challenges faced by the user, thereby gaining a profound

understanding of their expectations. The Empathizing stage is one in which designers should have amassed a substantial reservoir of valuable insights and cultivated a profound understanding of their users and their needs [30]. This foundational knowledge will adeptly guide them in executing the subsequent steps with efficacy. During this stage, designers are encouraged to observe and engage with their clientele, comprehending their expectations while also identifying underlying issues. There are numerous methods to initiate empathy with consumers, such as administering surveys and conducting qualitative interviews [31].

Define – Provide a Clear Explanation of the Identified Problems

A substantial volume of information has been amassed during the initial stage, which now necessitates thorough processing to eliminate irrelevant or redundant elements. The Define phase meticulously analyzes the data gathered from the Empathize phase to articulate a precise statement regarding the core issues at hand. In the realm of an effective problem statement, the emphasis should pivot away from mere business objectives and instead center on the intrinsic needs of individuals [32]. Prior to advancing to the ideation phase, such an approach facilitates a deeper comprehension of the underlying issue. Once the designers have meticulously gathered the foundational materials, they embark on synthesizing connections, scrutinizing their findings, and articulating the principal challenges and necessities that warrant attention. They articulate a precise problem statement that will navigate the entirety of this process [33]. A human-centered perspective must be upheld by the designers, who diligently strive to comprehend the needs and emotions of the target audience, thereby cultivating an emotional resonance that aligns closely with their aspirations. The Define stage is meticulously crafted to empower the design team to amass pivotal ideas that will facilitate the development of features, functions, and other components aimed at addressing the pertinent problem; furthermore, it enables actual users to resolve these issues independently with minimal difficulty. Subsequently, the design team will transition into the third stage, known as ideation, where they will pose probing questions in pursuit of innovative solutions [34].

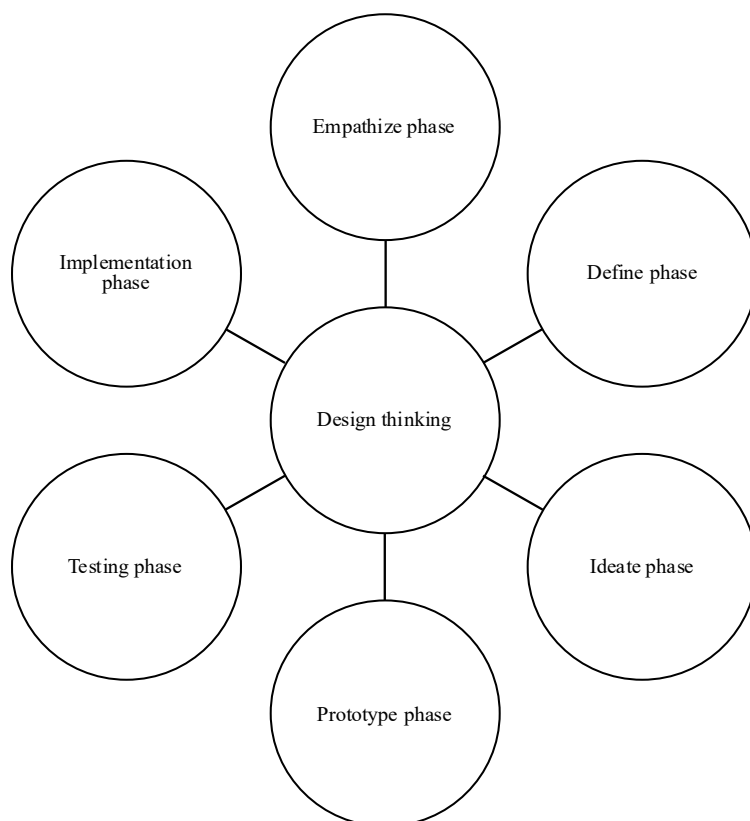


Figure 4. Design thinking – a six-step process.

Ideation – Unleash the Creativity and Start to Write Down Ideas

Conceive a plethora of eccentric and imaginative solutions to address the unfulfilled needs of users identified during the Define phase. The ideation phase serves as a pivotal transition from pinpointing problems to formulating solutions, culminating in the broadest conceivable spectrum of ideas. When the team engages in ideation, they concentrate on unearthing solutions to the inquiries they have delineated during the define stage [35]. The insights garnered in the define phase present themselves as challenges that must now be addressed, in accordance with the perspective cultivated by the design team. Give the design team unfettered autonomy to explore, adhering to the principle that no idea is too extravagant and that the sheer volume of concepts generated outweighs the importance of their initial quality. Foster collaboration among team members to cultivate a diverse array of ideas during this phase. They will engage in a collaborative exchange of ideas, intertwining, and recombining concepts while building upon one another's insights. In this environment, the team will have the opportunity to employ a diverse array of ideation techniques, such as prototyping, brainstorming sessions, brainwriting exercises, the generation of worst-possible ideas, and the SCAMPER method. They will cultivate innovative solutions to facilitate the ideation process—ranging from mind-mapping to illustrative drawing. In this stage, rather than passing judgment, the design team should liberate their thoughts, allowing their imagination to soar unrestrained. The ideation phase serves as a catalyst for the design team to invigorate free thinking and broaden the horizons of the problem space. This robust foundation empowers the design team to approach the challenge from diverse perspectives, proposing innovative solutions that may be articulated within their issue statement [36].

Prototype – Start Creating Solutions

For each identified issue, this experimental phase will endeavor to ascertain the most effective solution. This is achieved by employing scaled-down iterations of the concept, commonly referred to as prototypes, which are subsequently evaluated through user testing. Build intricate and tactile representations that correspond to a refined subset of concepts derived from the Ideation phase [37]. The essence of this stage lies in discerning which elements of the ideas resonate effectively and which do not. Don't attempt to isolate ideas concentrated on a singular aspect; instead, consider a comprehensive set of criteria that can be employed to identify two or three of the most exceptional concepts that may outperform others based on a defined framework. Make the ideas tangible. Develop a wireframe and solicit internal feedback, particularly if the sector is uncharted territory. Once you have selected your preferred option, the design team is anticipated to present a series of preliminary, low-resolution prototypes employing an experimental and iterative methodology, thereby facilitating your progression towards a conclusive solution. Modify it based on the feedback received, and continuously refine it utilizing rapid and rudimentary coding practices. The redefined prototype shall be disseminated among a distinct team of individuals. Each prototype ought to address a specific inquiry; it serves as an opportunity to ascertain whether the team has engineered the appropriate solution. Consequently, a prototype must be an entity with which users can engage, as this is the only manner in which the team will garner the insights they require. This is the authentic experimental phase: concepts are scrutinized, evaluated, embraced, dismissed, or further refined, and subsequently re-evaluated. The design team possesses the capability to modify and enhance products to optimally satisfy their customers' needs based on the insights gathered. The ultimate objective is to arrive at a solution that is deemed the most exemplary. By the conclusion of their prototype phase, the designers will acquire a more profound understanding of the product's constraints and the challenges they encounter. Furthermore, they will gain insightful perspectives into the actual user's behaviors, perceptions, and emotional responses when engaging with the final product [38].

Test – Examine Your Solutions*

Once the final prototype has been finalized, the design team must ascertain whether their conceptualization and strategic plan for execution genuinely align with users' needs and expectations. It is the phase that allows the product to undergo rigorous testing by examining how the target audience engages with it and what their responses entail. Thus, this remains an interactive phase, during which designers can iterate and further refine their ultimate solution to effectively address the comprehensive

user feedback. The entire product undergoes a comprehensive assessment by designers or evaluators, grounded in the most effective solutions discerned during the prototyping phase. This enhanced comprehension may assist the design team in gaining deeper insights into the contexts in which a product is utilized, as well as the thoughts, emotions, and behaviors exhibited by individuals in relation to that product. The team may find it necessary to revert to a preceding phase in the design thinking process and undertake a reexamination of those stages. Subsequently, they can advance to the next series of iterations, implementing any modifications or alterations required to eliminate alternative solutions. The ultimate objective is to acquire as much insightful information as possible regarding the product and its users. The outcomes attained at this juncture are frequently utilized to address issues and to adapt and refine the prototypes in a cyclical manner, which is intended to yield the most suitable solution for these users. It is imperative that, during the evaluation of the prototype, the designers refrain from instructing participants on its usage or dictating their actions. Rather, the designers should cultivate an immersive experience, allowing users to engage with the prototype organically, as though they were genuine end-users [39].

Implement – Actually Develop and Launch

Milton Glaser articulates the Implementation phase with his assertion that “There’s no such thing as a creative type. As if creativity is a verb, an exceedingly time-consuming endeavor. It entails taking an idea from the recesses of your mind and transmuting that concept into a tangible reality.” The endeavor will invariably be a protracted and arduous undertaking. When approached with diligence, it is bound to evoke a sense of labor. During this phase, the design team actualizes their vision, ensuring that their solution is not only materialized but also seamlessly integrated into the lives of the end users. This phase embodies the quintessence of design thinking, yet it is seldom acknowledged. While design thinking possesses the potential to effectuate a positive transformation within an organization, this is only attainable when the vision is actualized and genuine innovation transpires. The transformative potential of design thinking to enhance aspects of the end user’s experience is what renders it exceptionally effective. In numerous models, implementation is frequently regarded as the sixth or final stage, with the visualization of outputs occurring at this juncture. To present the ultimate solution, it represents the culmination of preceding stages that coalesce following the development process [40].

Design Thinking – An Iterative and Non-linear Approach

Design thinking creates data and artifacts to address real user needs, tested with actual users. By exploring ways to solve problems, design thinking uses collaborative expertise to create shared language and buy-in between designers for encouraging innovation. Design Thinking isn’t a predefined recipe for success but a ladder to help users when needed. For mastering Design Thinking, designers should be master-chef, using their own recipe and adjusting it as needed. In contrast to linear process, each stage should be iterative and cyclical [Figure 5] [41]. After initial prototype is built and tested, swing between understanding, empathy, and definition. That’s because the designers do not receive a true representation of their concepts until wireframes are meticulously developed, allowing their ideas to manifest. Initially, designers can conduct a precise analysis to ascertain whether their solution is genuinely effective. At this juncture, it is exceedingly advantageous to revisit their user research. Moreover, the phases of this process can be iteratively revisited. To attain the requisite outcomes essential for progress, an exercise must frequently be conducted multiple times within a given phase. During the definition phase, team members with different professional backgrounds and expertise lead to various approaches to problem identification. Spending time at the definition phase aligns team members to a common goal. Obstacles require repetition for buy-in. The six stages of design are not invariably linear. They need not adhere to a specific order and may, for instance, occur concurrently or in an iterative manner. In contrast to a strictly sequential approach, these stages should be perceived as a diverse array of modalities that exert influence on the overarching design project, as illustrated in Figure 5.

Design thinking can be applied to any area focusing on innovation. Design thinking in the classroom helps students solve problems independently. Problem solving and finding solutions are integrated into

the learning process of design thinking. Design Thinking is considered vital in education as it imparts skills to students. Since design thinking is like Innovative Thinking, students are urged to create their own uniqueness. Design thinking helps students detect, identify, and find solutions. The path of creativeness is shaped by design thinking.(Table-2) It strengthens students’ confidence in problem solving through ideas. They’ll discuss their rights and accept reality with assurance. Design thinking promotes innovative solutions to complex problems, encouraging creativity beyond the box. The students will create innovative solutions by focusing on empathy and understanding user needs. The design thinking process involves teamwork and communication. Students learn communication and collaboration skills by working together on design thinking projects [42] [Figure 6].

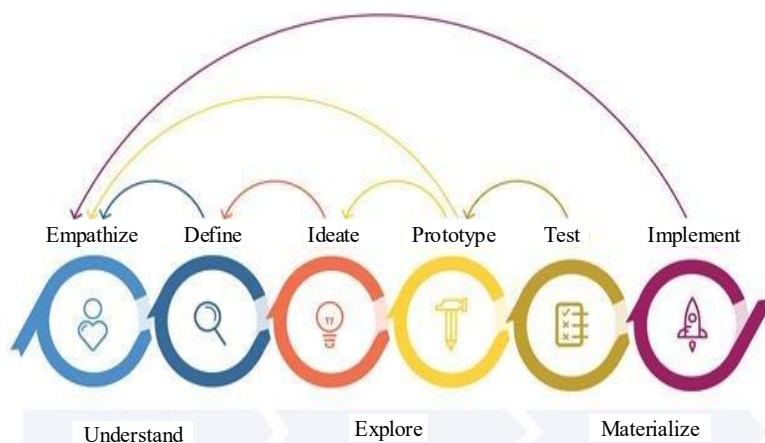


Figure 5. Design thinking – an iterative and non-linear approach.

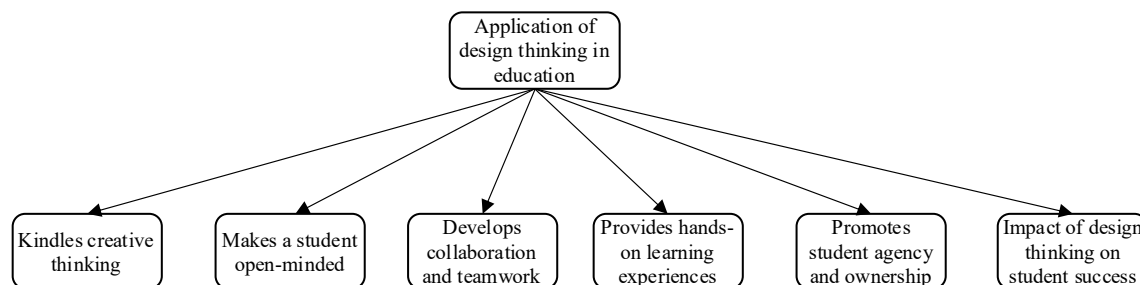


Figure 6. Design thinking technique.

Table 2. Parameters and features of design thinking.

S.N.	Parameters	Features
1.	Enhances problem-solving skills	Design thinking is a solution approach for students to improve critical thinking. Students find effective solutions by focusing on empathy and user needs.
2.	Prepares students for the workforce	In today's labour market, independent thinking is valuable. Employers seek candidates with experience in this thinking. Students should learn design thinking principles to better prepare for career challenges.
3.	Boosts-up communication and collaboration skills	Design thinking fosters communication and synergy. Engaging in it helps refine communicative and cooperative competencies valued in academic and professional spheres.
4.	Develops an entrepreneurial mindset	Design thinking serves as a catalyst for students to delve into innovative concepts and opportunities, as well as to embrace risks and experimentation. By nurturing an entrepreneurial mindset, students can cultivate resilience and adaptability—qualities that are immensely valuable in both academic and professional arenas.

Hands-on learning experiences, such as prototyping and testing, constitute integral components of the design thinking process. Students are likely to find these activities particularly engaging, as they afford them the opportunity to witness the evolution of their ideas and to obtain constructive feedback on their work, as illustrated in Figure 6. Design Thinking positions learners as active participants, empowering them to take ownership of their educational journey. Granting students the autonomy to explore and experiment fosters a profound sense of independence and accountability for their work, which can be exceedingly motivating. In the realm of education, students are empowered to discern and devise innovative solutions to pressing real-time challenges through the application of design thinking skills. Design thinking empowers students to cultivate empathy and employ a variety of tools to innovate and creatively address complex challenges. Students are regarded as astute contributors to society, adept at navigating intricate challenges. Design Thinking cultivates the following competencies in students, as delineated in [T. 2].

Implementation of Design Thinking in Educational Sectors

Design thinking represents a creative and human-centered methodology for addressing challenges and cultivating innovative solutions. This entails cultivating an understanding of users' needs and preferences, empathizing with their experiences, diagnosing their challenges, devising potential solutions, and creating prototypes that undergo rigorous testing and refinement. Design thinking can significantly enhance the interactivity, efficiency, and inclusivity of the educational experience for teachers, students, and administrators within the realm of academia. Examples of how design thinking and innovation are being employed within the education sector can be discovered here.

Personalized Learning

A personalized learning approach is an innovative methodology that tailors the curriculum, pedagogical strategies, assessments, and support mechanisms to align with the distinctive needs, interests, aspirations, and preferences of every student. The objective is to empower students to take command of their educational journey and advance on an individual basis. Teacher educators can leverage design thinking to formulate bespoke learning plans, tools, and resources that cater to the diverse learning styles, strengths, and challenges encountered by their students. Some educational institutions are leveraging online platforms that empower students to curate their own learning trajectories, access tailored content, receive instantaneous feedback, and monitor their progress comprehensively.

Collaborative Learning

Collaborative learning serves as a catalyst for fostering social interaction, enhancing communication, cultivating teamwork, and facilitating constructive peer feedback among students. This initiative aims to harness the collective knowledge, diverse perspectives, and rich experiences of the students' peers to enhance their learning outcomes and skill development. Design thinking can be instrumental for educators who are orchestrating collaborative learning endeavors, projects, and challenges that foster student cooperation, facilitate the exchange of ideas, tackle complex problems, and generate meaningful value. Some educational institutions are increasingly adopting the principles of design thinking as a foundational element in Project-Based Learning. In this approach, students collaboratively engage in identifying real-world challenges by delving into exploration and brainstorming innovative solutions, experimenting with prototypes, and rigorously testing their findings.

Flipped Classroom

A flipped classroom endeavors to revolutionize traditional pedagogical approaches and the conventional assignment paradigm. Its objective is to optimize classroom time for immersive learning, vibrant discussion, and the practical application of concepts, rather than mere passive listening and rote note-taking. Teachers can employ design thinking to cultivate innovative flipped classroom models, strategies, and resources that enable students to access content and materials prior to class, fostering the formulation of inquiries and reflections, and facilitating engagement in interactive and meaningful activities throughout the course. Some educational institutions are employing video lectures, podcasts,

and online quizzes as preliminary assignments, thereby utilizing classroom time for collaborative projects, case studies, or simulations.[43]

Gamified Learning

Gamified learning represents a method of integrating elements and principles derived from games into the educational process. Its primary objective is to render learning more engaging, stimulating, and rewarding, thereby enhancing motivation, participation, and retention among students. Design thinking can empower educators to craft gamified learning experiences, platforms, and systems that seamlessly integrate the elements and mechanics of games, such as objectives, regulations, feedback mechanisms, incentives, tiers, accolades, leaderboards, or narrative arcs. Some educational institutions are incorporating gamified educational applications, websites, or software that enable students to engage in learning experiences akin to gameplay, where they can accumulate points, unlock achievements, and compete with their peers [T. 3].

Inclusive Learning

Inclusion in education endeavors to guarantee equitable access, opportunities, and support for all students, irrespective of their background, identity, abilities, or circumstances. The objective is to cultivate a level playing field where every individual is afforded the opportunity to learn. In the realm of education, there exists a pressing aspiration to cultivate a culture that champions diversity, equity, and inclusion. Empowering educators to devise inclusive learning policies, practices, and environments that honor, esteem, and accommodate the diverse needs of each student can be effectively facilitated through the principles of design thinking. Some educational institutions are implementing the Universal Design for Learning (UDL) to cultivate pragmatic and accessible educational experiences that accommodate the diverse modalities of representation, expression, and participation among students [T. 4].

STUDENT CENTRIC TEACHING LEARNING PROCESS

Inclusion of Generative Learning Course in Curriculum

At the commencement of an Engineering Programme (B-Tech), the utilization of functional models can significantly enhance students' comprehension in courses, such as "Innovation and Design Thinking" (IDT). Working models furnish a hands-on and pragmatic approach that empowers students to translate theoretical concepts into practice, thereby facilitating a deeper engagement with the subject matter and enhancing their problem-solving capabilities. Herein lies the manner in which the utilization of working models may enhance the efficacy of studying the subjects delineated in Table 3.

Implementation of Modern Infrastructure & Facilities in Education System

Providing all requisite facilities in the teaching and learning process is imperative for cultivating a conducive and effective educational environment. These facilities encompass an array of physical resources, advanced technological instruments, and ancillary services that collectively contribute to a holistic learning experience. Cultivating an environment rich in facilities necessitates meticulous planning, judicious resource allocation, and ongoing maintenance. It is imperative to conduct a thorough analysis of the influence exerted by these facilities on the enhancement of teaching and learning outcomes on a regular basis. Additionally, it is essential to gather feedback from both students and educators to facilitate ongoing modifications, as illustrated in Table 4.

CONCLUSION

The re-imagining of education in India requires a comprehensive approach. Redefining curriculum, embracing innovative pedagogies, leveraging technology, empowering educators, fostering inclusivity, and strengthening community engagement can equip students for 21st-century challenges and opportunities. This framework is a visionary shift towards an education system nurturing critical thinkers, problem solvers, and responsible global citizens. Collaboration and investment in this transformation can make the vision of a modern Indian education system a reality, steering the nation

Table 3. Parameters and features of working models.

S.N.	Parameters	Features
1.	Concrete understanding	Students need solid understanding to build workable model. Deeper comprehension goes beyond memorising, aids in concretely comprehending ideas behind innovation and design thinking.
2.	Application of theory	Students apply theoretical ideas to working models, reaffirming comprehension of subject matter. Demonstrates how theoretical info translates into useful solutions.
3.	Creative exploration	Creativity and inventiveness emphasized by design thinking. Students encouraged to experiment with concepts and solutions by building models, developing creative thought capacity.
4.	Problem solving	To create a functional model, overcome difficulties and barriers. This helps students think critically and find answers through trial and error in real-world problem-solving situations.
5.	Interdisciplinary learning	Design thinking and innovation frequently necessitate expertise from a multitude of disciplines. The creation of functional models can entail the integration of concepts from diverse fields.
6.	Experiential learning	Working models provide a profound experiential learning opportunity. Students engage in hands-on activities, which can foster a more enduring and significant comprehension of the subject matter.
7.	Engagement and motivation	Hands-on projects engage students and motivate them to actively participate. Enthusiasm can spill over into overall subject engagement.
8.	Prototyping and iteration	The iterative nature of design thinking is ideal for working models. Students can prototype, test, gather feedback, and make improvements—mimicking the innovation process.
9.	Real-world connection	Working models address real-world problems to help students see learning relevance beyond the classroom.
10.	Presentation skills	Students present working models to peers or instructors, improving presentation and communication skills vital in professional settings.
11.	Long-term retention	Engaging senses through projects enhances knowledge retention. Students remember more when actively creating.

Table 4. Key facilities for teaching and learning.

S.N.	Parameters	Features
1.	Classroom Infrastructure	Well-conceived classrooms, characterized by judicious seating arrangements, ample lighting, effective ventilation, and superior acoustics, are indispensable for fostering a conducive and focused learning environment.
2.	Technology Integration	Incorporating advanced technologies such as computers, projectors, interactive whiteboards, and audiovisual equipment can significantly enhance pedagogical practices and foster immersive learning experiences.
3.	Library Resources	A meticulously curated library, replete with an extensive array of books, reference materials, digital resources, and online databases, serves as an invaluable asset for both students and educators in their quest for research and learning.
4.	Laboratories	Science, computer, and other specialized laboratories offer immersive experiences and foster a profound comprehension of theoretical principles.
5.	Internet Access	Reliable internet connectivity empowers students and educators to access a myriad of online resources, conduct comprehensive research, and engage in an array of digital learning endeavors.
6.	Multimedia Materials	Educational videos, animations, simulations, and interactive content can render intricate concepts more comprehensible and captivating.
7.	Collaboration Spaces	Designated spaces for collaborative endeavors, discussions, and joint projects foster teamwork and enhance communication competencies.
8.	Workshops and Training	Regular workshops and training sessions for educators and students empower them to adeptly harness the available resources and technology.

9.	Support Services	Counseling, academic advising, and learning support services are instrumental in ensuring that students receive the comprehensive assistance necessary for their academic and personal success.
10.	Accessible Facilities	Facilities that are universally accessible, encompassing individuals with disabilities, foster an environment of inclusivity and diversity.
11.	Research Opportunities	Research facilities, sophisticated equipment, and exemplary mentorship empower students to immerse themselves in scientific research and inquiry-based learning.
12.	Extracurricular Spaces	Facilities dedicated to sports, the arts, clubs, and various extracurricular pursuits play a pivotal role in fostering holistic development and cultivating a well-rounded education.
13.	Flexible Seating	Providing a diverse array of seating alternatives (e.g., bean bags, standing desks) caters to varying learning preferences and enhances comfort during extended study sessions.
14.	Outdoor Learning Spaces	Natural surroundings and outdoor environments can serve as alternative learning spaces that cultivate creativity and offer a refreshing change of scenery.

towards a brighter future. To conclude, this paper discusses both positive and negative impacts of PBL and experiential learning. Despite negatives, it positively influences teaching-learning processes. Project-based and experiential learning help students move from concrete to abstract theories by observing different phenomena. PBL is goal directional, emphasizing positive outcomes. Experiential learning focuses on students reflecting on experiences through experiments to gain insights and practical knowledge. Project based and experiential learning engages students with various learning materials, promoting critical thinking, problem solving, and practical knowledge. Both approaches develop students' intellectual and motor skills in using tools and technologies. Experiential and project based learning allows learners to apply skills collaboratively, reducing waste of time and resources and exposing them to real-world challenges. Project-based learning offers students diverse learning options. Teachers use experiential learning to teach students how to design and conduct experiments. The digital age has profoundly impacted education, leading to a paradigm shift in the learning experience and educators' roles. Educators now serve as facilitators, mentors, curators, and designers of personalized educational journeys. Technology is an enabler, not a replacement, providing adaptive tools, immersive experiences, and flexible learning models. Educators must be grounded in digital literacy and technological proficiency to navigate this terrain successfully. Ethical and social considerations are important for educators, addressing issues like digital citizenship and media literacy. Collaborative learning communities locally and globally help educators grow professionally and enrich students' learning. As assessment strategies evolve towards authenticity and continuous feedback, evaluating educator success encompasses adaptability and a commitment to ongoing development. Using digital age requires holistic approach. Educators, institutions, and policymakers collaborate to redefine roles, harness technology, and empower learners for future marked by digital innovation. Companies use various techniques to design and solve problems. Industries apply Design thinking to deliver satisfactory projects for customers. In Design thinking, students adapt to a learning environment where knowledge is acquired through exploration. Design thinking is essential in education, enabling students to analyze problems effectively and gain experience. The adoption of a SCT and learning method focuses on each student's unique needs, interests, and abilities in education. This method emphasizes teamwork, critical thinking, and personalized involvement, recognizing students as active participants in their education. By focusing on the student, educators can promote better understanding, connections, and lifelong learning. To adopt SCT, educators must be dedicated to professional development, ready to change teaching strategies, and have a strong support network. Additionally, provision suitable infrastructure, tools, and technology to encourage active and interesting learning. In a world with easy access to information, Student-Centered Education goes beyond imparting knowledge; it fosters a love of learning, curiosity, and equips students to navigate a complex global terrain. Education has the potential to transform individuals by equipping them to become lifelong learners and engaged participants in society, prioritizing the aspirations and needs of students above all else.

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