

Reimagining Education Policy: A Framework Based on Indian Knowledge Systems

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

Abstract

Digital transformation has 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 accessible, 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. The framework aims to foster love of learning and equip students with skills for a 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 the 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 work 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 by 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 its growing young population, faces these challenges. Hence, there is

an urgent need to reimagine education for the 21st century. This chapter presents a framework for transforming education in India. It includes innovative approaches to curriculum, pedagogy, assessment, teacher training, technology, inclusivity, and community engagement [1].

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

During the COVID-19 pandemic, teaching shifted to online learning. This transition was enabled by technology. This study explores the importance of technological interventions. Educators now use technology for assessments.

Project-based and experiential learning are distinctive ways of learning that are highly interconnected and independent. PBL 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, which are uncommon in traditional methods. This learning method allows students to explore their personal interests through beneficial 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-world scenarios [4].

Various learning approaches can be implemented in educational systems. Project-based and experiential learning are being adopted by the Indian educational system to improve student outcomes. Teacher training and resources are essential in this regard. The delivery of education globally is now limited by technology. This shift has caused issues for teachers and students adapting to e-learning. Technology combined with PBL and experiential learning can help both teachers and students adjust to educational change. The digital age is characterized by the 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 has transformed education, changing how we learn, teach, and engage with knowledge. Computers, tablets, smartphones, and the internet are now essential in modern society and have greatly impacted education. This digital revolution has transformed education, creating new possibilities and challenges for educators. Educational technology integrates diverse digital tools to enhance teaching and learning processes. These include whiteboards, multimedia content, web portals, and virtual classrooms, which enhance education beyond time and space. Design thinking is a creative sector that aids problem-solving with innovative solutions. It is a new sector that combines logic, creativity, reasoning, and intuition to solve clients' problems. Design thinking originated in the 1970s but gained focus in the early 2000s owing to the work of Tim Brown, CEO of IDEO. Brown et al. saw the need for design thinking (DT) in business to foster innovation by integrating closely with other

design firms. Human experience is the key to design thinking, known as human-centered design. In the 21st century, an advanced economy requires a skilled workforce, highlighting ambiguous and difficult skills and revealing their meaning. Education now emphasizes critical thinking, collaboration, problem-solving, and innovation [5].

This shift aligns with skills, standardized assessments, and professional certifications. In addition, 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 services, and environmental sustainability. Design Thinking contributes to the development of digital technology, creation of physical goods, and stimulation of 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 a teacher-led model to a customized educational process for specific students that includes active learning, individualized learning, critical thinking, self-problem-solving, interest and relevance, use of the latest technology, real-world relevance, autonomy, collaboration, and more. The main goal of student-centered teaching (SCT) is to actively involve students in their learning to enhance their understanding and retention. SCT empowers students, fosters lifelong learning, and prepares them for success in changing environments. 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 does not 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 cultivate digital literacy. Digital literacy involves critically evaluating, ethically navigating, and using technology for learning and communication. Initiatives like the "One Student, One Device" program and digital literacy training bridge the digital divide and empower learners. An 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.

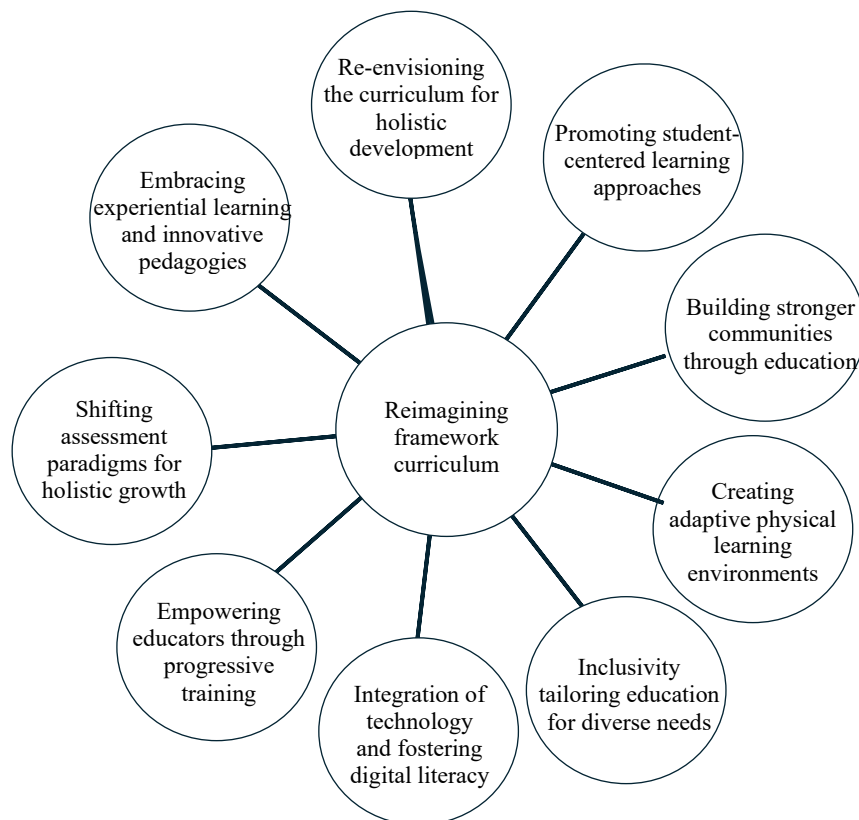


Figure 1. Reimagining framework curriculum.

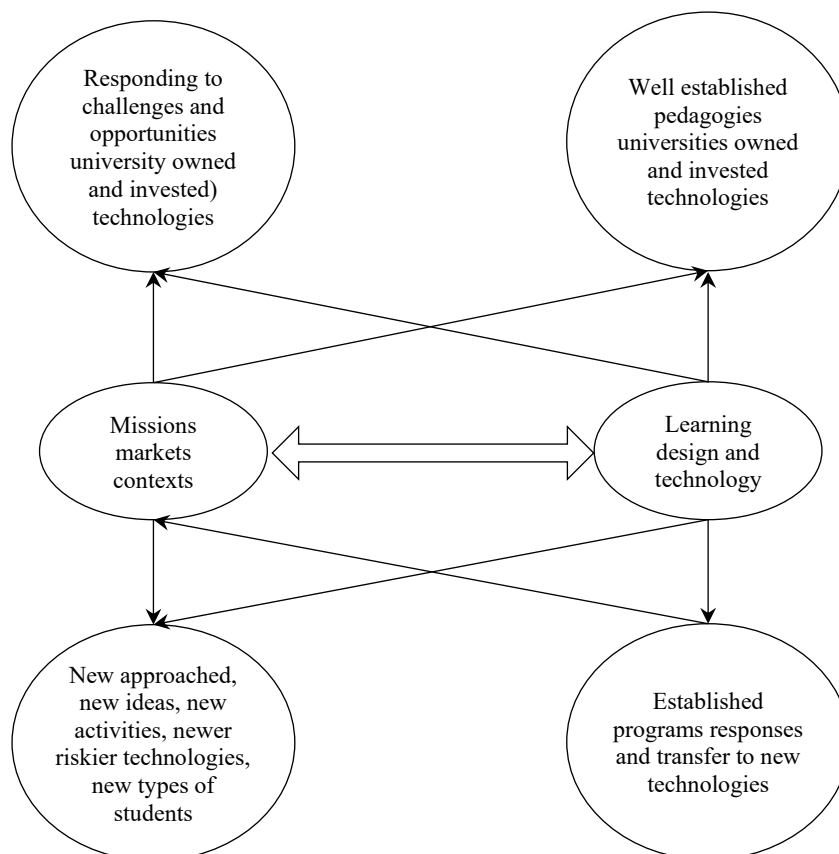


Figure 2. Lack of institutional learning approach.

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 and Table 1).

Reflecting on Practice

Continuous improvement is the key to educational transformation. Educators must reflect on and develop their teaching practices. By evaluating methods, seeking feedback, and being open to innovation, educators can refine their instructional strategies to better meet diverse student needs (Table 1).

Table 1. Professional responsibilities in educational transformation [10].

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 the 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 a deeper understanding and better prepare for complex challenges.
3.	Fostering interdisciplinary studies	The Indian knowledge system promotes interdisciplinary studies, recognizing the 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 the 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 is 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 the country progresses, it must use heritage to shape education for youth to navigate the 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 the 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 educators 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	A transformed framework empowers learners in the 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 the 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, and integrate sustainable development into the 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 the well-being of students and the 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 an 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.

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 improvement. Furthermore, 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 transformative educational experiences by nurturing these tools. Through dedication, educators unlock their potential and shape a brighter world [11].

Professional responsibilities guide educators in transforming education to create impactful learning experiences for students. 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 can create a brighter, more equitable, and sustainable future [12].

CRITICAL ROLE OF PROJECT-BASED AND EXPERIMENTAL LEARNING APPROACHES

PBL Approach

PBL is a significant educational approach in which students collaborate on real-world problems. Students apply their 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. PBL is a popular teaching method. It provides systematic learning instructions to students. It is a student-centric learning approach. It measures teaching effectiveness and helps students self-monitor their actions and abilities. This method bridges academic and real-life experiences, allowing students to explore the differences. PBL prepares students to acquire authentic skills for the future. Students are empowered to take ownership of their studies and apply their knowledge effectively. The COVID-19 crisis has led to a focus on e-learning in education. Technology and projects are key to achieving academic success. By doing real problem projects, students learn relevance and apply their skills. They design, plan, and execute projects independently, thereby promoting responsibility. Inculcates interpersonal skills for effective project completion [13] (Figure 3).

Benefits of PBL Approach

PBL motivates students to connect with the curriculum and increase their knowledge. It helps develop an interest in various subjects and sparks a love for learning. Through learning modes, students face educational realities. Projects improve students' 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 socioeconomic constraints. PBL enhances students' listening skills and 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 the contributions they have made. PBL develops the thinking capacity to self-evaluate projects and efforts. It aids in forming judgments, opinions, and critical thinking. Students identify their strengths and weaknesses. PBL promotes critical and divergent thinking compared to traditional methods [14].

PBL shows students real-life challenges, helping them realize their capabilities and problem-solving skills. Students must acquire problem-solving skills to analyze and solve new problems effectively. These skills involve various strategies that prepare students for future practice. This elevates their self-esteem to unprecedented levels. PBL facilitates an enriching exchange of ideas, thoughts, and

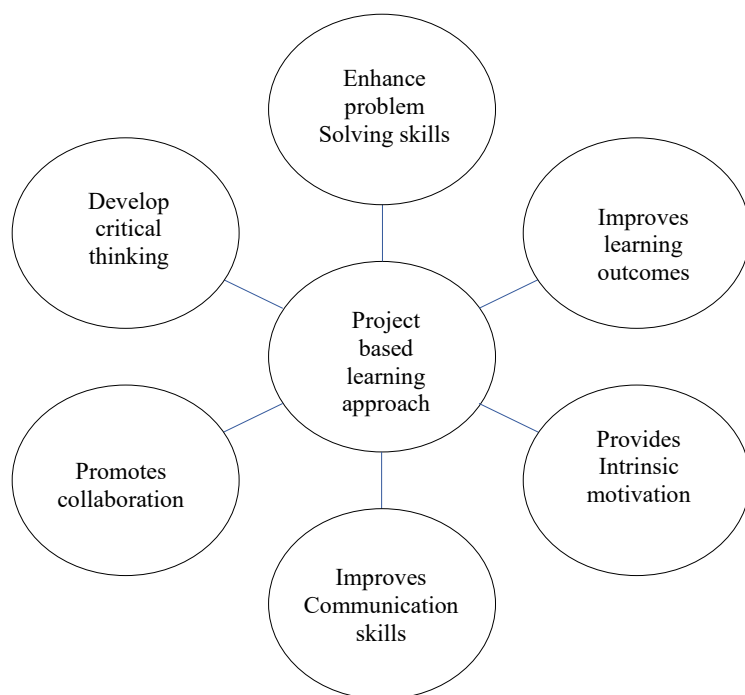


Figure 3. Project-based learning approach.

perspectives among students within a collaborative group setting, significantly enhancing their communication skills. It promotes peer accountability, leading to positive project outcomes, as shown in Figure 3. They acquire the crucial communication skills essential for PBL.

Experiential Learning Approach

Experiential learning engages students' day-to-day experiences with academic discourse, focusing on learning through experiences. Dewey popularized the rejection of rote learning and emphasized 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 the real world with classroom activities. Unlike traditional approaches, experiential learning offers an alternative to classroom instruction that focuses on competition rather than motivation or interest. John Dewey believed that education is about reconstructing experiences, with the process and goal being the same. However, for meaningful learning, students must participate in experiments without the intervention of teachers. COVID-19 challenges led to online learning, hindering hands-on learning and direct communication opportunities for students. However, experiential learning transforms traditional learning by reinforcing dynamic skills. Students enhance their learning strategies and skills through new experiments. It encourages positive attitudes, values, and beliefs among students and facilitates intellectual power. Experiential learning offers opportunities to broaden one's view of the world, gain insight into one's own abilities, develop collaborative skills, understand learning materials, build self-confidence, and enhance management skills. Personal development results and forms the basis for future experiences [15].

Benefits of Experiential Learning Approach

Experiential learning captivates students intellectually, physically, and socially, immersing them in authentic tasks that facilitate real learning. This approach enables students to learn how to translate theoretical concepts into practical applications, fostering their personal and professional growth. Through this pedagogical method, the 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 them to reflect on their choices of endeavors.

Experiential learning is an innovative pedagogical approach that actively engages students in exploration, experimentation, analysis, problem-solving, inquiry, and meaning construction. This form of learning cultivates collaboration, communication, teamwork, and observational skills, thereby enhancing the learners' capacity for multitasking. Through experiential learning, individuals 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 errors and implement the remedies suggested by their mentors [16].

A Brief Difference Between PBL 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, and special education. Both approaches are similar in motivating students, developing critical thinking, problem-solving, collaborating, communication, and self-evaluation skills. Although project-based and experiential learning are similar, they have differences. PBL is interdisciplinary and goal-focused. In PBL, 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, PBL 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 underscores 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 a teacher-centric to child-centric approach, allowing students to choose fields for higher studies and prepare for future expectations [17].

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 approaches combine teaching with technology [18]. It marks a departure from traditional education to progressive education. Schools need to redesign the 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. During the time of COVID-19 emergency, students and education faced pedagogical, technical, and psychological challenges. Sudden changes in instruction made them realize the need for technology. But as schools return to normal, teaching-learning processes accelerate with technological learning. Technology helps teachers create PBL 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 [19].

ROLE OF EDUCATORS IN THE DIGITAL AGE

Significance of Redefining Educators' Roles

Redefining educators' roles in the digital age is crucial. The growth of technology has rendered

traditional teaching methods outdated for modern learners. Educators must embrace technology to create engaging learning environments tailored to the individual needs of students. Personalized learning enables educators to adjust their instruction to match each student's proficiency level. Technology enables collaborative learning and interactive discussions, preparing students for the future with essential skills such as 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 thrive in the perpetually evolving digital landscape. Finally, reimagining the roles of educators is 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 [20].

Changing Landscape of Education in the Digital Age

The digital age has brought about a digital transformation in education. Technology integrated into education reshapes learning delivery and experiences. Traditional classrooms are becoming technology-enhanced, with digital tools complementing traditional teaching. Technology integration in classrooms drives digital transformation in education. Educators must utilize digital tools, such as 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, the digital age shifts towards blended and online learning. Blended learning combines face-to-face with online, allowing for learning at one's own pace. Online learning enables access to educational content and remote interactions with instructors. These models cater to diverse learning preferences, allowing students to access education beyond the traditional boundaries. Educational technology tools have proliferated in the digital age, transforming teaching and learning experiences. Learning management systems (LMSs) are central to educators' management of course content, tracking student progress, and administering assessments. Virtual classrooms and video conferencing are essential for synchronous online learning, enabling real-time interactions between educators and students [21].

Evolving Student Demands and Needs

Students in the digital age are called "digital natives" because 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 those of previous generations. They prefer instant access to information, interactive content, and constant connection. Educators must understand digital natives to engage them effectively in the learning process. Digital literacy is essential for today's learners. It involves navigating, evaluating, and effectively utilizing digital technologies. Students need skills to discern credible sources and understand the ethical implications of their digital actions. Digital citizenship is crucial in the digital age. It involves responsible and ethical online behavior. Educators are key to teaching students' online safety, privacy, and respectful communication. Promoting good digital citizenship among educators empowers students to become responsible and respectful digital citizens who contribute positively to online communities and society. Finally, understanding the evolving demands of digital natives is essential for educators to effectively cater 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 [22].

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

maintain order and discipline in the classroom by setting rules, managing behavior, and ensuring a conducive learning atmosphere. Classroom management focuses on control and creating a structured environment. In the digital age, classroom management includes online interactions and digital etiquette. Educators teach responsible digital citizenship and online behavior. They foster a positive digital learning culture, encouraging respectful communication and ethical conduct. Assessment in traditional models 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 the 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 [23].

Emerging Roles of Educators in the Digital Age

In the digital age, educators need to shift from being instructors to facilitators of learning, guiding students in the 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 the digital age, educators use technology for interactive activities and discussions to help students learn. Digital information offers both opportunities and challenges for students. Educators choose digital content to support students' learning objectives. In the digital age, educators are focusing on holistic student development. The educators' role extends beyond academic content to guide students in developing life skills, such as communication, collaboration, and adaptability. Students' well-being is nurtured, encouraging a growth mindset for resilience and facing challenges in the future. As mentors, educators provide personalized feedback, encouragement, and emotional support to empower students to realize their full potential. Technology helps educators maintain ongoing communication with students, creating opportunities for meaningful mentorship beyond the physical classroom [24].

Embracing Technology as an Enabler, not a Replacement

Technology has emerged not only to disrupt but also to enrich the human connection between educators and students. Educators play a pivotal role in fostering profound relationships with their students and cultivating a nurturing learning environment. By actively engaging with students, demonstrating authentic concern, and exhibiting profound interest in their well-being and academic progression, educators cultivate trust and rapport that nurture a constructive learning environment. While technology can enhance communication and collaboration, the human touch remains indispensable in comprehending individual needs, providing tailored support, and fostering a sense of belonging within the educational community. Virtual and augmented reality provide immersive educational experiences that transcend conventional classroom environments. Virtual reality (VR) immerses students in virtual realms, allowing them to investigate historical landmarks, scientific phenomena, and meticulously simulated real-life scenarios. Augmented reality (AR) overlays digital content onto the real world, enriching learning with interactive elements. Educators play a vital role in contextualizing and debriefing such encounters. Human touch ensures that students connect virtual experiences with real-world knowledge. Blended learning combines face-to-face instruction with online learning 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 interaction. 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 [25].

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 that educators 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 [26].

Assessing and Measuring the Impact of Redefined Educator Roles

In the digital era, conventional assessment methodologies failed 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 in teacher education. These methodologies evaluate students' competencies in 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 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 their educational journey. Formative assessments are continuous and diagnostic in nature, enabling educators to discern students' strengths and weaknesses and adapt their instructional strategies accordingly. Technology tools help educators monitor student performance, provide feedback, and adjust instructional strategies in real time. Continuous feedback and formative assessment cultivate a dynamic and responsive learning environment, thereby enhancing student outcomes [27].

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 myriad learning domains. Advancing students' 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 on 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 [28]. The ongoing professional growth and development of educators is paramount to their effectiveness in the digital era. Evaluating educators' growth transcends conventional professional development workshops and encompasses a continuous journey of learning and seamless integration of technology into pedagogical practices. Educators should 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 establish objectives for ongoing development in the digital era [29] (Figure 4).

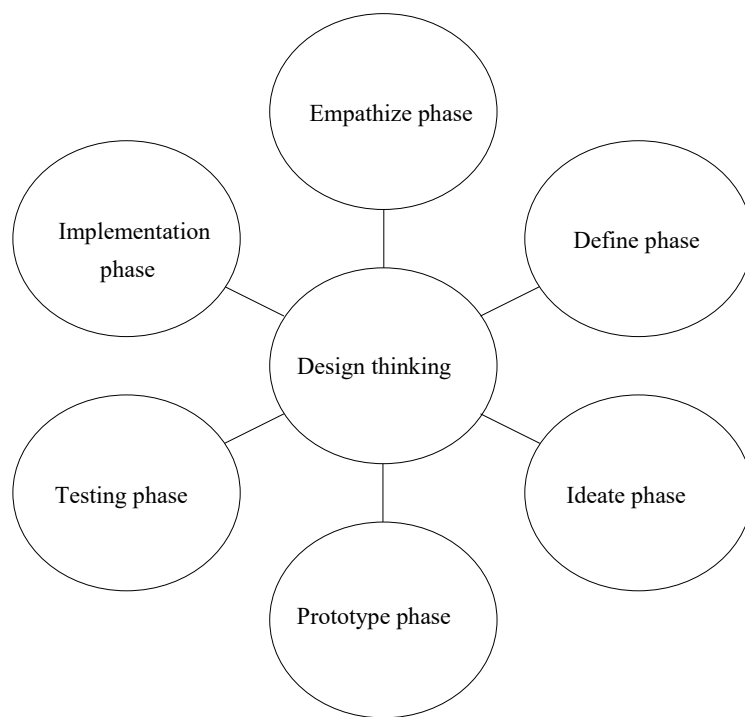


Figure 4. Design thinking—a six-step process.

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 shown in Figure 4.

Empathize—Analyze and Understand the Needs of the User

In human-centered design methodologies, such as design thinking, the cultivation of empathy is paramount [30]. This enables designers to transcend their preconceptions about the world and attain genuine insights that resonate with the authentic needs of users. It involves deliberately setting aside the designer's requirements, cognitive frameworks, and preconceived notions to adopt another perspective. Similarly, design thinking aspires to comprehend individuals' emotions and genuine needs, the motivations behind their behaviors, and what holds significance for them. Therefore, designers should 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. In the empathizing stage, designers should have amassed a substantial reservoir of valuable insights and cultivated a profound understanding of their users and their needs [31]. This foundational knowledge will adeptly guide them in executing subsequent steps with efficacy. During this stage, designers are encouraged to observe and engage with their clientele, comprehend their expectations, and identify underlying issues. Numerous methods can be used to initiate empathy with consumers, such as administering surveys and conducting qualitative interviews [32].

Define—Provide a Clear Explanation of the Identified Problems

A substantial volume of information was 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. 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 [33]. Prior to advancing to

the ideation phase, this approach facilitates a deeper comprehension of the underlying issues. 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 entire process [34]. Designers must uphold a human-centered perspective, diligently striving to comprehend the needs and emotions of the target audience, thereby cultivating 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 transitions to the third stage, known as ideation, where probing questions are posed in pursuit of innovative solutions [35].

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 [36]. The insights garnered in the defined phase present challenges that must 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 of the project. 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 the 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. The ideation phase catalyzes the design team to invigorate free thinking and broaden the horizons of the problem. This robust foundation empowers the design team to approach challenges from diverse perspectives, proposing innovative solutions that may be articulated within their issue statements [37].

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 [38]. The essence of this stage lies in discerning which elements of the ideas resonate effectively and which do not. Do not 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 [39].

Test—Examine Your Solutions

Once the final prototype is finalized, the design team must ascertain whether their conceptualization and strategic plan for execution genuinely align with users' needs and expectations. This phase 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 comprehensive user feedback. The entire product undergoes comprehensive assessment by designers or evaluators, based on 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 and 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 reexamine those stages. Subsequently, they can advance to the next series of iterations and implement any modifications or alterations required to eliminate alternative solutions. The ultimate objective is to acquire as much insightful information as possible regarding a product and its users. The outcomes attained at this juncture are frequently utilized to address issues and adapt and refine prototypes in a cyclical manner, which is intended to yield the most suitable solution for these users. During the prototype evaluation, designers must refrain from instructing participants on its usage or dictating their actions. Designers should cultivate an immersive experience, allowing users to engage with the prototype organically, as though they were genuine end users [40].

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, it is an exceedingly time-consuming endeavor. It entails taking an idea from the recesses of your mind and transmuting that concept into a tangible reality.” This 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 has not only materialized but also seamlessly integrated into the lives of end users. This phase embodies the quintessence of design thinking, yet it is seldom acknowledged in literature. 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 occurs. The transformative potential of design thinking to enhance aspects of the end user’s experience 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 point. The ultimate solution represents the culmination of the preceding stages that coalesce following the development process [41].

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 to encourage innovation. Design Thinking is not a predefined recipe for success but a ladder to help users when needed. For mastering design thinking, designers should be master chefs, using their own recipe and adjusting it as needed. In contrast to a linear process, each stage should be iterative and cyclical (Figure 5) [42]. 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, 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 that focuses on innovation. Design thinking in classrooms helps students solve problems independently. Problem-solving and finding solutions are integrated into the design thinking learning process. Design Thinking is vital in education because it imparts skills to students. Since design thinking is similar to Innovative Thinking, students are urged to create their own uniqueness. Design thinking helps students detect, identify, and solve problems. The path of creativity is shaped by design thinking (Table 2). It strengthens students' confidence in problem-solving through ideas. They will discuss their rights and accept reality with assurance. Design thinking promotes innovative solutions to complex problems and encourages creativity beyond the box. Students will create innovative solutions by focusing on empathy and understanding user needs. The design thinking process involves teamwork and effective communication. Students learn communication and collaboration skills by working together on design thinking projects [43] (Figure 6).

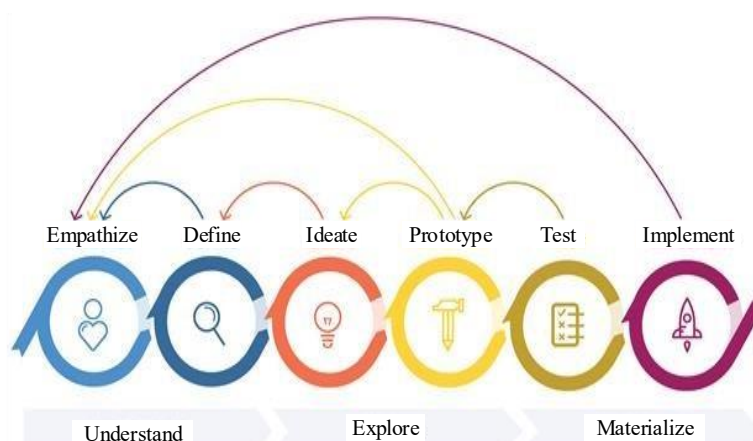


Figure 5. Design thinking—an iterative and non-linear approach.

Table 2. Parameters and features of design thinking [10].

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 labor 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.	Boost 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 catalyzes 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.

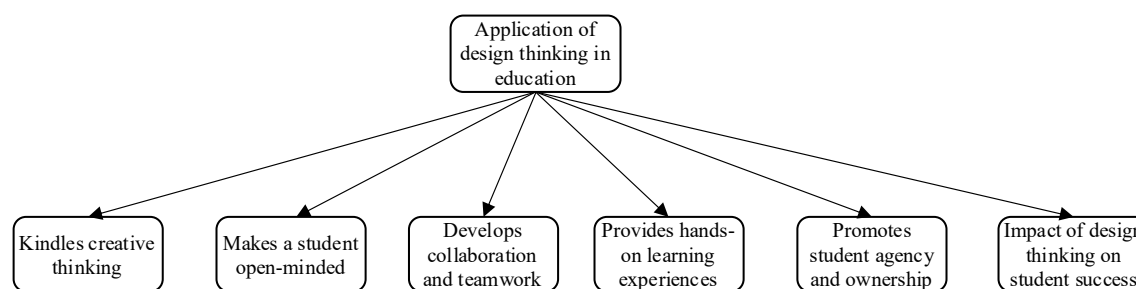


Figure 6. Design thinking technique.

Hands-on learning experiences, such as prototyping and testing, are integral components of the design thinking process. Students are likely to find these activities particularly engaging, as they allow them to witness the evolution of their ideas and 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 journeys. Granting students autonomy to explore and experiment fosters a profound sense of independence and accountability for their work, which can be exceedingly motivating. In 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 various 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 Table 2.

Implementation of Design Thinking in Educational Sectors

Design thinking is 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 inclusiveness of the educational experience of teachers, students, and administrators within academia. Examples of how design thinking and innovation are employed in 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 individually. 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 students. Some educational institutions are leveraging online platforms to empower students to curate their own learning trajectories, access tailored content, receive instantaneous feedback, and monitor their progress comprehensively.

Collaborative Learning

Collaborative learning catalyzes 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 students' peers to enhance their learning outcomes and skill development. Design thinking can be instrumental for educators 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 foundational elements in PBL. In this approach, students collaboratively engage in identifying real-world challenges by exploring and brainstorming innovative solutions, experimenting with prototypes, and rigorously testing their findings.

Flipped Classroom

A flipped classroom endeavors to revolutionize traditional pedagogical approaches and conventional assignment paradigms. Its objective is to optimize classroom time for immersive learning, vibrant discussion, and 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 employ video lectures, podcasts, and online quizzes as preliminary assignments, thereby utilizing classroom time for collaborative projects, case studies, or simulations [10].

Gamified Learning

Gamified learning is a method of integrating game-derived elements and principles into the educational process. Its primary objective is to render learning more engaging, stimulating, and rewarding, thereby enhancing students' motivation, participation, and retention. 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, rules, 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 (Table 3).

Inclusive Learning

Inclusion in education guarantees 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 allowed to learn and grow. In education, there is a pressing aspiration to cultivate a culture that champions diversity, equity, and inclusion. Design thinking can effectively empower educators to devise inclusive learning policies, practices, and environments that honor esteem and accommodate the diverse needs of each student. Some educational institutions are implementing universal design for learning (UDL) to cultivate pragmatic and accessible educational experiences that accommodate the diverse modalities of representation, expression, and participation among students (Table 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 of courses such as “innovation and design thinking” (IDT). Working models provide a hands-on and pragmatic approach that empowers students to translate theoretical concepts into practice, thereby facilitating 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 and Facilities in the Education System

Providing all requisite facilities in the teaching and learning processes 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 holistic learning experiences [43]. 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 regularly. Additionally, it is essential to gather feedback from both students and educators to facilitate ongoing modifications, as shown in Table 4.

Table 3. Parameters and features of the working models.

S.N.	Parameters	Features
1.	Concrete understanding	Students need a solid understanding to build workable models. Deeper comprehension goes beyond memorizing and 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 are emphasized by design thinking. Students are 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, computers, 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.

S.N.	Parameters	Features
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.

CONCLUSION

Reimagining education in India requires a comprehensive approach. Redefining the curriculum, embracing innovative pedagogies, leveraging technology, empowering educators, fostering inclusivity, and strengthening community engagement can equip students to face 21st-century challenges and opportunities. This framework is a visionary shift towards an education system that nurtures 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 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 helps students move from concrete to abstract theories by observing different phenomena. PBL is a directional goal, emphasizing positive outcomes. Experiential learning focuses on students reflecting on experiences through experiments to gain insights and practical knowledge. Project-based and experiential learning engage 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 PBL allows learners to apply skills collaboratively, reducing the waste of time and resources and exposing them to real-world challenges. PBL 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 commitment to ongoing development. Using the digital age requires a holistic approach. Educators, institutions, and policymakers collaborate to redefine roles, harness technology, and empower learners for a 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 SCT and learning methods 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 their 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 and 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 students’ aspirations and needs above all else.

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