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Learning, Unlearning, Relearning: Strategies for 21st Century Learners to tackle the Digital Learning Paradox

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ABSTRACT

The 21st century faces a digital learning paradox where an abundance of information leads to cognitive overload. This paper examines strategies for the learning cycle of learning-unlearning-relearning and emphasizes the need for cognitive flexibility in a fast-paced digital landscape. Using Braun and Clarke's thematic analysis, it identifies key themes, including psychological barriers to unlearning and the transformative potential of AI in education. Findings indicate that while digital tools enhance accessibility, they may result in shallow processing and decreased retention. The research proposes solutions such as categorizing knowledge and encouraging metacognition to foster lifelong learning in institutional settings. Additionally, a conceptual framework for adaptive learning is presented, advocating for skill-based pedagogies over traditional content-focused approaches.

Keywords: Adaptive Learning, Digital Learning Paradox, Lifelong Learning, Learning–Unlearning–Relearning, 21st Century Education, Technology-Mediated Learning Environments.

INTRODUCTION

Since digital learning platforms and technology improvements are becoming an essential part of education in India, the learning landscape has evolved swiftly in the 21st century (Jha et al., 2024; Paul, 2024). This change is the outcome of initiatives like the National Education Policy 2020, which places a strong emphasis on the development of 21st-century skills involving communication, creativity, critical thinking, and collaboration (Anand, 2024). These abilities are essential for keeping up with the Fourth Industrial Revolution (4IR), which brings about fast changes and necessitates constant learning and adaptation to be relevant. Even if there is a wealth of knowledge available, learners frequently experience cognitive overload as a result of the sheer volume of data brought about by this digital transition (Paul, 2024). According to theoretical viewpoints on learning adaptation, learners who want to remain relevant in the digital era need to be able to relearn new ideas and unlearn material that has become obsolete (Datta et al., 2023).

The digital learning summarizes the fact and difficult nature of the interaction between the incorporation of digital technologies into learning and the challenges that it has created both to learners and educators. Although it has been demonstrated that digital tools like Learning Management Systems (LMS) and gamification help improve the level of student engagement and individualize the learning process, they bring both positive and negative effects, namely, workloads and burnout among faculty, as well as hindrances such as insufficient training and support on an institutional level (Aldhilan et al., 2025). A counterintuitive reluctance to technology develops in older adults based on the social factors and different degrees of digital literacy, making it harder to use digital learning (Wang, 2024). Moreover, the overuse of digital connectivity among students has been associated with a drop in motivation and the attitude towards learning, and this observation implies that, on the one hand, the use of digital tools can improve the learning experience; on the other hand, overuse of digital tools may result in disengagement (Priawasana, 2024). The given paradox explains why digital integration must be used in balanced ways to accommodate the positive and negative impacts of technology in education (Novoa & Mendez, 2021).

The “digital learning paradox” may be understood as tension whereby expanded access to information through digital technologies coincides with reduced depth of processing, lower retention, and fragmented understanding due to cognitive overload and continuous information switching. To effectively deal with this paradox, one must acquire critical abilities including learning, unlearning, and relearning. This paradox is further intensified by the digital divide, which

exacerbates inequitable access to stable connectivity, devices, and high-quality digital learning environments, particularly in rural regions (Sunil & Azimi, 2023). Despite these constraints, digital learning has demonstrated measurable potential to expand access, support skills acquisition, and enhance applied knowledge in professional domains such as community mental health nursing (Govindan et al., 2024).

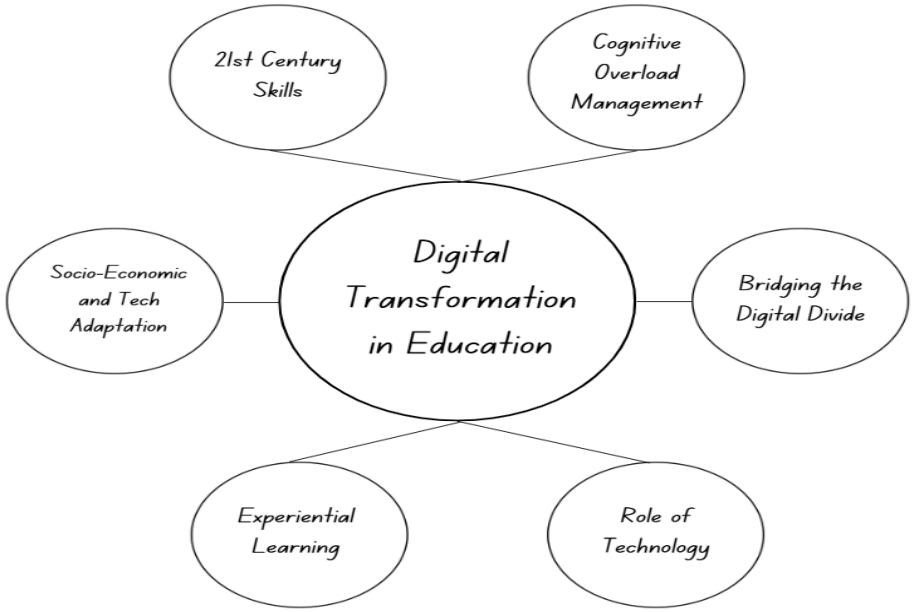
Education systems throughout the world are struggling to provide students with these necessary skills. Learning new abilities that meet the needs of a fast-evolving digital world and unlearning old ones are two ways that learners must undertake to overcome this paradox (Paul, 2024). As Alvin Toffler noted, *"the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn".* For a multilingual nation like India, this entails utilising technology like as Large Language Models (LLMs) to improve educational opportunities and overcome linguistic barriers (Jha et al., 2024). Subsequently combining studying independently with information and communication technology (ICT) can assist students in efficiently handling the wealth of information, reducing cognitive overload and creating a more flexible and inclusive learning environment (Paul, 2024).

The capacity to learn, unlearn, and relearn has become essential for students in the twenty-first century, particularly in India, where societal shifts and technology breakthroughs are changing the nature of education and work. (Anand, 2024; Ramakrishna, 2014) Learning provides foundational knowledge and skills, whereas unlearning enables the critical examination and revision of previously held assumptions that may no longer be functional. By contrast, relearning stresses ongoing skill improvement to remain competitive in dynamic circumstances influenced by digitalisation and globalisation (Chakra & Kandhiraju, 2024; Kumar, 2024). Iterative processes of learning, unlearning, and relearning support the development of competencies emphasised in NEP 2020 such as critical thinking, creativity, collaboration, and communication by enabling learners to continually revise understanding and apply knowledge adaptively (Anand, 2024; Bhandari & Mathew, 2023). The integration of experiential and interdisciplinary learning within the Indian curriculum reflects a shift from rigid content transmission toward adaptive, application-oriented knowledge structures (Jacobs et al., 2022; Kumar, 2024).

Indian learners require psychological competencies including adaptive thinking, metacognitive regulation, and collaborative capacity that are supported by the processes of learning, unlearning, and relearning in order to deal with issues like unemployment and social inequality, since life skills are becoming increasingly valuable on a worldwide scale (Chakra & Kandhiraju, 2024; Rahman et al., 2025). According to Mukherjee and Bhadra (2024), yoga instruction and social-emotional learning also help digital natives develop cognitive and emotional resilience while unlearning undesirable behaviours. Learning these three processes

can therefore enable students to prosper in the face of socioeconomic change and technological disruption (see Figure 1).

Figure 1: Navigating India's Evolving Education Landscape



Note: The figure depicts the digital transformation in education. Own Work. Copyright attribution is required while reproducing the figure.

Theoretical Framework

The research is based on a synthesized conceptual framework, which incorporates cognitive and transformative perspectives to describe how learners maneuver through the so-called digital learning paradox the conflict between the abundance of information and cognitive limitations.

The general concept of Cognitive Load Theory (CLT) offers the basis of knowledge of the biological constraints of human information processing (Asma & Dallel, 2020; Sweller, 2024). CLT assumes that the working memory has grossly inadequate capacity and duration when handling new information, but the long-term memory is practically unlimited (Artino, 2008). In digitally mediated environments, successful learning requires the management of three types of load: intrinsic load, determined by the inherent complexity of the material; extraneous load, caused by suboptimal instructional design or digital distractions; and germane load, which is the cognitive effort devoted to meaningful schema construction (Asma & Dallel, 2020; Baxter et al., 2025; Sweller, 2024).

Constructivist Learning Theory is the process by which they go about creating these schemas and that the concept of knowledge is not a commodity that can be transferred but rather is constructed by the learner themselves internally (Hendry, 1992). This active construction is supported by Metacognitive Self-Regulation, a cyclical process involving forethought, performance, and self-reflection (Hartelt & Martens, 2024). By means of self-regulated learning, people observe their mental activities, establish objectives, and modify their methods to suit changing situational requirements (Arianto & Hanif, 2024; Hamzah et al., 2023; Wa and Tungalag, 2024).

To achieve mastery in complex, "ill-structured" digital domains, learners must transition from routine expertise to Adaptive Expertise (Spiro et al., 1989; Sweller, 2024). Although routine expertise pertains to efficiency in stable environments, adaptive expertise refers to the capability to use knowledge in the flexible and creative way in response to unfamiliar situations (Pelgrim et al., 2022). Cognitive Flexibility Theory (CFT), which states that advanced knowledge acquisition is only possible when one avoids over-simplifying. According to CFT, learners have to cross-traverse the terrain of a subject by working with more than one representation of information so that they can build the adaptive construction of knowledge required to apply it in the real world (Spiro et al., 1989).

Lastly, the Transformative Learning Theory (TLT) describes the more profound mental reconstruction that is necessary whenever digital disruptions cause a disorienting dilemma. TLT observes learning to be in terms of applying past interpretations to construct a new or a modified interpretation of the meaning of his or her experience to be used in further action. Critical reflection and questioning frames of reference the sets of assumptions by which we perceive the world cause the learners to experience a perspective shift (Fleming, 2018; Mary E, 2019; Taylor, 2007). This transformation allows learning outdated mental models and relearning more inclusive, discriminating, and adaptable schemas that is appropriate to the 21st-century digital ecosystem.

The combination of these views creates a single structure of cognitive resources management (CLT) and the promotion of structural flexibility (CFT), self-regulatory control (Metacognition), and psychological depth (TLT) to attain adaptive expertise in the fast-paced digital world (Brown & Friesen, 2025; Hartelt and Martens, 2024).

Learning in the Digital Age

The digital era has elevated learner autonomy through self-directed learning approaches that emphasise agency, reflection, and adaptive knowledge construction. Rather than merely defining self-directed learning, this study examines its functional role in managing information abundance. Digital environments require learners not only to access information but to evaluate

relevance, regulate attention, and integrate knowledge across contexts (Curran et al., 2019; Freeman et al., 2019).

In order to adapt to changing difficulties, the heutagogical approach promotes critical thinking and self-reflection, emphasising learner-centred techniques (Mohammadi, 2023; Tang, 2024; Verma, 2024). Digital literacy is essential for facilitating various learning paradigms, particularly in Indian rural and urban settings where equal access to technology might help close the gap in learning achievement (Susanti & Nurhayati, 2024). However, in order to organise and analyse their learning processes, students frequently need assistance in making the most of digital resources (Morris & Rohs, 2021). Through the promotion of interest, collaboration, and habit formation, cutting-edge approaches such as Interest-Driven Creator (IDC) loops and Design Thinking have shown effective in improving digital literacy and self-directed learning capacities (Mohammadi, 2023; Sriwisathiyakun, 2023). These techniques are essential for equipping students for the challenges of the digital learning paradox.

Unlearning as a Cognitive Process

As a dynamic process that develops over time, Unlearning involves the deliberate revision of entrenched habits of mind, including the emotional discomfort associated with relinquishing familiar assumptions. Through unlearning, learners revise interpretive frameworks, allowing new information to reorganise prior understanding, which enables learners to update their understanding by overcoming biases and integrating new information through assimilation and accommodation, in which they incorporate new information into existing schemas and modify their understanding to take new perspectives into consideration (Klammer et al., 2024).

Unlearning enables students to overcome prejudices and accept alternative learning paths by rejecting preconceived notions or theories rather than forgetting. Unlearning restructures existing knowledge frameworks by modifying interpretive patterns rather than erasing prior knowledge, hence learners can improve their cognitive flexibility and adaptability to digital learning environments to make room for new discoveries (Tikhonov et al. (2023). Effective unlearning techniques help students stay relevant in an increasingly digital environment by enabling them to update their skills and knowledge and overcome the challenges of digital learning (Klammer et al., 2024; Saichenko, 2023).

Relearning and Adaptability

Within this paradox of increased access but diminished retention, relearning becomes essential for sustaining meaningful understanding for learners. Neuroscience describes relearning through mechanisms such as refresh learning,

which mirrors the brain's capacity to inhibit existing representations and acquire critical knowledge, thereby strengthening cognitive flexibility and long-term retention (Pankaj et al., 2016; Wang et al., 2024).

Functionally, relearning reinforces and restructures knowledge through repeated engagement supported by executive processes, particularly attentional control, working-memory set shifting, and inhibitory regulation, enabling learners to revise interpretations in light of new information. This neurocognitive plasticity aligns with growth mindset theory, which fosters persistence in the face of challenge, enhances academic buoyancy, and supports cognitive-behavioral flexibility (Chen et al., 2024; Xue et al., 2024). Evidence further indicates that such adaptive capacities facilitate successful transitions across changing academic and occupational contexts (Puspitasari et al., 2024). Collectively, these findings clarify how the interaction of executive control mechanisms and adaptive mindset processes underpins lifelong learning and effective adaptation.

The Digital Learning Paradox

In India, the digital learning paradox is a complex issue where learners are overloaded with information but experience difficulty encoding and retrieving information in durable, transferable forms. Artificial intelligence (AI) supports adaptive learning by structuring information flow, providing feedback, and personalising learning pathways. Its role is not to replace memory but to support deeper processing through targeted engagement. The need for efficient digital platforms and tools to enable Education 4.0 which incorporates technology like artificial intelligence and the Internet of Things to transform learning experiences has been brought to light by the swift transition to digital learning, which has been accelerated by the COVID-19 pandemic (Sangole et al., 2022).

AI can assist learners manage the abundance of digital information and retain relevant knowledge by offering individualised learning experiences that are catered to each learner's needs (Sangole et al., 2022). According to research conducted on Indian dentistry students, adding multimedia formats and interactive technologies to digital learning platforms can also increase student engagement and practical abilities (Prakash et al., 2023). Finally, to solve the digital learning paradox, a comprehensive strategy integrating AI, personalised learning, and theoretical frameworks is needed to develop flexible learners who can successfully negotiate the intricacies of the digital environment (Govindan et al., 2024; Sangole et al., 2022).

This study draws attention to important gaps in the literature, especially the paucity of studies on structured unlearning procedures which refer to intentional pedagogical practices that facilitate critical reflection, conceptual revision, and replacement of ineffective knowledge patterns in digital environments in the Indian context. These studies are essential for navigating the

21st century's rapid technology breakthroughs and knowledge transitions. This discrepancy emphasises how difficult it is for learners to adjust to the rapid shifts in technology, which results in learning that is superficial rather than profound. Finding efficient unlearning and relearning strategies is crucial given the needs of domains like technology and data science as well as the objectives of NEP 2020. In order to assist Education 4.0 and Industry 4.0, improve digital learning, and provide students with the lifelong learning skills necessary for global competitiveness, this study attempts to uncover such techniques. The present study aims to answer the following research questions:

1. What strategies support processes of learning, unlearning, and relearning in digitally mediated learning environments?
2. What strategies enable learners to effectively navigate digital information overload and support adaptive knowledge formation?
3. How can educators and higher education institutions facilitate and sustain the learning–unlearning–relearning cycle?

RESEARCH METHOD

Research Design

This study employs an interpretative literature review using thematic analysis of peer-reviewed scholarly publications addressing digital learning, cognitive adaptation, and knowledge transformation to examine how the processes of learning, unlearning, and relearning are conceptualised in digital learning contexts, with particular relevance to higher education in India. The core analytical framework for analysing ideas from the relevant literature is thematic analysis, as suggested by Braun and Clarke (2006) was used. The purpose of the review is not to generate empirical findings but to synthesise and reinterpret existing scholarly knowledge in order to develop conceptual clarity regarding adaptive learning processes in digitally mediated environments.

Data Collection

Using Boolean operators, articles related to "learning and unlearning," "relearning in the digital age," "digital learning environments," and "pedagogical transformation through technology" were retrieved from scholarly databases such as ERIC, JSTOR, Scopus, Web of Science, and Google Scholar, only published, peer-reviewed journal papers serve as the study's data source. The *inclusion criteria* for the literature were peer-reviewed with an emphasis on lifelong learning or higher education, relevance to the learning-unlearning-relearning conceptual triangle, particularly in digital environments, and published between 2000 and

2024 to guarantee current relevance. Non-peer-reviewed sources, research that were only quantitative in nature, and publications that were unrelated to the subject matter were among the *exclusion criteria*. The review prioritised recent scholarship while incorporating foundational theoretical works where necessary to establish conceptual continuity.

Data Analysis

The study employs thematic analysis as an interpretative analytical procedure to identify recurring conceptual patterns across the selected literature. Following established qualitative synthesis principles, publications were examined to identify how learning adaptation processes are defined, related, and operationalised in digital learning contexts. The study employs Braun and Clarke's (2006) Six-Phase Framework for Thematic Analysis to interpret and synthesize the data:

1. Familiarization with Data: The researcher thoroughly read and reviewed selected texts, noting recurring ideas to build familiarity with the literature and its context.
2. Generating Initial Codes: Key concepts, learner behaviors, and pedagogical strategies were manually coded to identify patterns related to learning in digital environments.
3. Searching for Themes: Codes were grouped into initial themes such as cognitive flexibility, experiential learning, and digital distractions.
4. Reviewing Themes: Themes were refined for clarity and consistency, with weak or overlapping ones adjusted or removed.
5. Defining and Naming Themes: Each theme was clearly defined and labelled to reflect both conceptual meaning and practical relevance.
6. Producing the Report: Themes were organized into a structured narrative, supported by examples, to address the research questions effectively.

The use of thematic analysis was not an empirical coding process, but a planned process of synthesizing concepts with conceptual adequacy rather than empirical saturation was used to ensure analytical rigor. Conceptual adequacy was obtained where the other sources added reinforcement or improvement of the already present themes without significantly changing the emergent conceptual association between learning, unlearning and relearning processes. This method is suitable when conducting interpretative reviews and the hypotheses are to synthesise theoretical constructs and not to measure population characteristics.

Ethical Considerations

The selection, representation, and citation of literature were all done in accordance with ethical research guidelines as the study was review-based.

Plagiarism, distortion, and biassed interpretation of the original authors' conclusions were avoided. All sources have been properly cited, and only publicly accessible, peer-reviewed content was used. To reduce researcher bias and guarantee the validity and reliability of the thematic analysis, reflexivity was upheld throughout the whole study process.

THE NATURE OF DIGITAL LEARNING

Digital learning refers to educational processes mediated by digital technologies that expand access, interaction, and modes of knowledge representation. The widespread use of ICT, which allows students to access materials, work together with classmates, and customise their educational experiences, is the factor that contributes to the expansion of ICT which has shifted learning from predominantly instructor-centred transmission toward flexible, technology-mediated knowledge engagement (Paul, 2024; Susanti & Nurhayati, 2024). The shift from conventional to digital pedagogies has been accelerated up by the COVID-19 pandemic, and blended learning is showing promise in disciplines including architecture education (Siddiquee et al., 2023). With its adaptive learning technologies that offer personalised instruction, skill assessments, and interactive support, AI is a key component in improving digital learning (Ghosh, 2025). By offering personalised evaluations and dynamic interactions, AI-powered solutions like chatbots and virtual assistants further improve learning outcomes (G et al., 2022). In general, these technologies are changing the Indian educational scenario by increasing accessibility and flexibility in the learning process.

Challenges in Digital Learning

The learning process gets complicated by a number of challenges it encounters. Due to learners' constant exposure to large volumes of information, *cognitive overload and digital fatigue* are serious problems that result in mental tiredness and reduced productivity (Kashyap & Tamuli, 2022; Sunil & Azimi, 2023). While digital platforms make knowledge easily accessible, its transient nature makes it difficult to keep (Girma & Abebe, 2019; Paul et al., 2021).

This creates the *paradox of easy access vs. hard retention*. Deep learning is further hampered by *short attention spans and information fragmentation*, since students frequently concentrate on small, disjointed bits of knowledge rather than thorough comprehension (Gupta & TS, 2024; S, 2024). The difficulty of retaining significant insights in the face of an overload of information is highlighted by the paradox of *abundant knowledge vs. meaningful retention*, which also emphasises the necessity of efficient knowledge filtering and application techniques (Kashyap & Tamuli, 2022; Khan & Ahmad, 2024).

Effective Learning Strategies

Personalised, immersive, and critical thinking techniques are key components of effective learning strategies in the digital era, which improve educational outcomes. Using AI and adaptive algorithms, personalised learning adapts instructional materials to each student's requirements, increasing student engagement and academic achievement (Qushwa & Onia, 2024; Vanegas et al., 2024). Deeper comprehension is promoted by experiential and immersive learning that links theoretical knowledge with real-world applications, bolstered by interactive multimedia and real-world scenarios (Panda, 2024; Suliman & Sevnarayan, 2024).

According to Napitupulu et al. (2024), critical thinking and metacognition are essential for preparing students to traverse intricate digital settings because they motivate them to critically evaluate material and consider their own learning experiences. Since these strategies target a variety of learner profiles and overcome accessibility barriers, they are especially pertinent in the Indian context. The growth of conceptual understanding and autonomy is balanced when AI-driven technologies are integrated with human-centered teaching (Chen, 2025; Qushwa & Onia, 2024). The paradoxes of digital education may be effectively tackled by students while they become ready for new difficulties by integrating reflective practices, immersive experiences, and personalised pathways.

THE PROCESS OF UNLEARNING

The act of rejecting or changing previously learnt information, opinions, or behaviours that are no longer applicable or useful in the present situation is known as unlearning (Jain, 2005; Nevshehir, 2021). By allowing people to adjust to new information and paradigms, it plays a critical role in the evolution of knowledge, especially in the quickly evolving digital context (Rice, 2023). Cognitive biases, emotional ties to preexisting information, and fear of change are psychological barriers to unlearning that might prevent people from adopting fresh perspectives (Jain, 2005; Rice, 2023). Because they enable learners to critically analyse their presumptions, recognise outdated mental models, and deliberately choose to adopt new ways of thinking, reflection and self-awareness are crucial elements of the unlearning process (Elassery, 2023; Nevshehir, 2021).

The necessity for unlearning becomes particularly evident when learners face “conflicting competencies” situations where newly introduced concepts closely resemble prior knowledge but differ fundamentally in meaning, leading to a false carryover of obsolete mental models (Praseeda & Srinivasa, 2025).

Unlearning becomes especially significant in Indian contexts as it challenges traditional educational paradigms and encourages students to give up rote memorisation and passive learning techniques (Elassery 2023; Parida and

Besra, 2023). In the 21st-century digital learning environment, where knowledge is always changing and skills require regular revisions, educators may assist students in developing the flexibility and adaptability necessary to succeed by cultivating a culture of unlearning (Rice, 2023).

Obstacles to Unlearning

In the Indian context, socio-emotional complexity, institutional rigidities, and cognitive biases are the main causes of unlearning difficulties. In financial and entrepreneurial decision-making, cognitive biases such as loss aversion and overconfidence bind students to outdated mental models and prevent them from adapting to new paradigms (Yadav et al., 2025). Socio-emotional learning (SEL) programs and inflexible higher-secondary systems encounter obstacles that hinder innovation due to institutional impediments including standardised curriculum and pushback from educators who are committed to outdated pedagogies (Neelakantan et al., 2024).

Systemic problems like misaligned policies and insufficient training resources make these structural barriers even worse. Limited mental health support exacerbates socio-emotional challenges, such as the stigma associated with changing deeply held beliefs and emotional distress during transitions, as demonstrated by studies on adolescent mental health tools and the experiences of DR-TB patients (Nagarajan et al., 2022; Sehgal et al., 2025). Emotional conflict is also brought on by the cultural shame associated with failure and the general opposition to iterative learning methods, especially in settings that value academic correctness above holistic development (Pental, 2025). Multifaceted treatments targeting individual attitudes, institutional adaptability, and emotional resilience are necessary to overcome these linked constraints.

Strategies for Unlearning

In the context of Indian education, unlearning techniques place a strong emphasis on encouraging flexibility and open-mindedness, critical thinking, and a lifelong learning culture. The National Education Policy (NEP) 2020's emphasis on promoting creativity and innovation in higher education is in line with the idea that promoting open-mindedness entails accepting other viewpoints and adjusting to new paradigms (Rani & Rohitash, 2024). Unlearning redundant habits requires critical reflection and assumption-questioning, which is especially important when using ICT tools and flipped classroom models, which question conventional teaching strategies and encourage active learning (Bhowal & Alam, 2025; Nongbri, 2024).

In order to foster a culture of lifelong learning, educational frameworks must incorporate ongoing skill development, as demonstrated by the NEP 2020's

focus on entrepreneurship and research to equip students for dynamic difficulties (Singh & Mishra, 2023). Furthermore, encouraging fairness and inclusion guarantees that all students, particularly those from under-represented groups, have access to life-changing educational opportunities. This cultivates the growth-oriented and adaptive attitude necessary for unlearning in the digital age (Nandan, 2023).

THE ART OF RELEARNING

Since knowledge and skills evolve constantly in today's dynamic environment, relearning has become crucial and outdated expertise is becoming redundant. As technology advances and economic needs shifts, lifelong learning is no more optional; it is essential to be relevant (Krinkin & Berlenko, 2024). Global trends have led the Indian educational system to place a greater emphasis on lifelong learning in response to these issues, but it frequently finds it difficult to successfully incorporate this paradigm into practice and policy (Mandal, 2019). Because memory reconsolidation enables the brain to update and reinforce prior information through retrieval and new learning events, neuroscience emphasises the significance of relearning (Malone et al., 2011; Tay et al., 2018). By utilising neuroplasticity, this approach helps people unlearn old ideas and adjust to new situations. In India, promoting a culture of ongoing relearning through individualised, tech-driven methods might help reduce skill obsolescence and equip students to succeed in the rapidly evolving world of the 21st century.

Relearning Strategies for Digital Learners

According to Kasar (2025), the National Education Policy (NEP) 2020 highlights the importance of adopting holistic approaches that prioritise socio-emotional intelligence and cultural competency in order to equip learners with 21st-century skills. Successful relearning techniques include using technology to improve virtual learning environments and digital pedagogy, which enables teachers to adjust to shifting demands from learners (Dass, 2024). Self-regulated e-learning techniques also promote analytical skills and intellectual curiosity, such as the use of digital tools like mind maps and gamification (Vapiwala & Pandita, 2023).

In rural areas, where issues like inadequate infrastructure need creative solutions to guarantee fair access to digital learning opportunities, these tactics are especially crucial (Nedungadi et al., 2018). Students who adopt these relearning techniques can successfully navigate the challenges of online learning. Furthermore, navigating digital learning ecosystems requires robust metacognitive strategies, as learners must actively self-regulate their cognitive processes to successfully unlearn outdated practices and acquire new competencies (Ali et al., 2025).

Institutional Role in Relearning

Fostering a cyclical nature of learning requires a significant institutional involvement in relearning. A key component of this approach is curriculum design, which uses transformational and adaptive techniques that are like to those employed in design studios during the COVID-19 pandemic to assist build resilient learning environments (Ceyhan et al., 2023). In order to fulfil individual requirements, personalised and adaptable learning environments (PALE) necessitate careful consideration of the learning context, demonstrating the critical role educators play in creating adaptive learning environments (Hemmler & Ifenthaler, 2022). As it helps close the gap between theoretical knowledge and practical abilities, industry-academia partnership is also essential for skill upgrading, guaranteeing that learners possess the necessary competences for the digital age (Kossack & Bender, 2023). Through the integration of these components, educational institutions may provide learners with appropriate support as they navigate the digital learning paradox through ongoing cycles of learning, unlearning, and relearning.

THE ROLE OF TECHNOLOGY IN LEARNING, UNLEARNING, AND RELEARNING

AI and Personalized Learning

In order to improve learning, unlearning, and relearning through individualised education, artificial intelligence is essential. As envisioned by the National Education Policy 2020, individualised learning paths are made possible by AI technologies such as GPTs, which may customise instructional content to meet the specific needs of each student and promote interdisciplinary and holistic learning (Mondal et al., 2023; Pachai, 2024). Students from various language backgrounds might benefit from gamification and interactive digital tools like generative-based chatbots, which provide nuanced and context-specific replies, hence improving learning results (Ashfaque & Kayte, 2024). Through early interventions and personalised learning plans, predictive analytics in education helps teachers to predict student performance and maximise learning outcomes (Owusu et al., 2024). Together, these technologies provide flexible learning settings that improve the effectiveness and inclusivity of education for Indian students in the 21st century.

Digital Literacy and Information Processing

Technology-integrated pedagogy, which emphasises critical thinking and problem-solving abilities, can help students develop the ability to discern reliable

sources from false information, which is necessary for effective unlearning (Chukwuemeka & Garba, 2024; Hanmantrao, 2024). As it helps learners to effectively traverse complex digital environments, improving digital literacy is crucial for unlearning out-of-date concepts and relearning new material (Tripathi et al., 2022). The increasing integration of multi-modal learning analytics in techno-driven environments further enriches this process, providing empirical insights into how human learning behaviors intersect with adaptive digital interfaces (Verma & Varghese, 2025).

Additionally, controlling digital distractions is essential for concentrated learning, and techniques like immersive technology and adaptive learning platforms can lessen these distractions by producing interesting and customised learning opportunities (Bandyopadhyay & Sharma, 2022). Learners may maximise their digital literacy abilities by using these strategies, which will guarantee efficient information processing and unlearning in the digital age (Chukwuemeka & Garba, 2024; Kaur et al., 2023). To fully capture the dynamics of modern digital education, it is essential to ground these behavioral patterns in heutagogical principles, emphasizing self-determined learning and continuous professional development as the core drivers of adaptability (Verma, 2025). Finally, successful relearning in dynamic environments is heavily influenced by individual psychological variables; for instance, high self-efficacy acts as a catalyst for continuous learning, whereas professional self-doubt creates significant barriers to knowledge acquisition (Rababa et al., 2026).

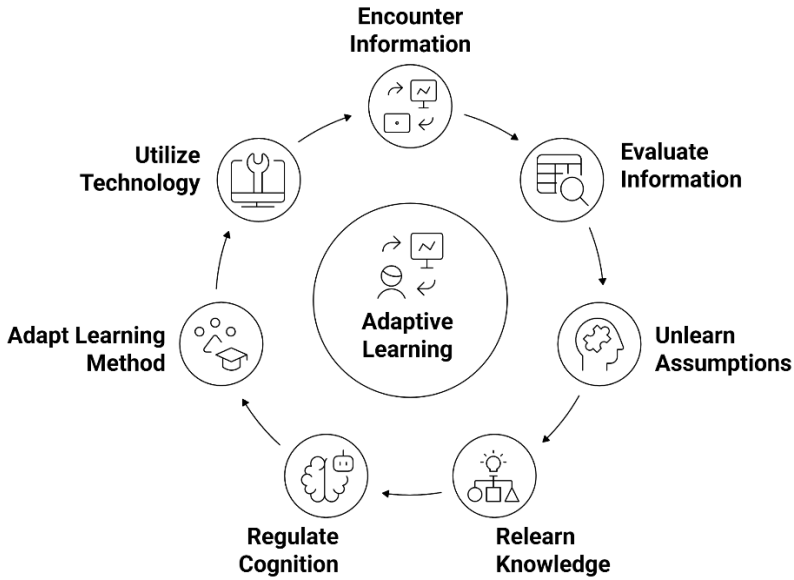
Challenges of Technology-Driven Learning

The efficacy of technology-driven learning in India is restricted by a number of obstacles. According to research on technology integration in education, learners who rely too much on digital tools for problem-solving may have a lack of critical thinking abilities (Sardar et al., 2024). Concerns about ethics also surface, especially in relation to cybersecurity and data protection, which users frequently ignore. Women, in particular, have obstacles in adopting technology because they lack appropriate awareness of ethical standards (Bhatnagar, 2024). Additionally, the implementation of the National Education Policy 2020 has highlighted the challenges of the digital divide and accessibility, since inadequate infrastructure and restricted internet connection hinder fair access to digital learning materials (Sreenivas et al., 2025). It is imperative that these issues be resolved in order to guarantee that technology improves education without escalating already-existing disparities.

Conceptual Model of Adaptive Learning

This paper introduces a conceptual model of adaptive learning describing learner reactions to the challenges of digital mediated learning conditions (see figure 2). The model theorises adaptive learning as a cyclic model where learners are exposed to information, assess the information relevance, correct the previous knowledge structures, and stabilize the new knowledge structures through repetitive interaction with the environment. The model does not conceive learning as a cumulative process; instead, it locates the process of adaptation as a dynamical connection between cognitive regulation, transformation of knowledge and mediation of technology.

Figure 2: Conceptual Model of Adaptive Learning Cycles in Digitally Mediated Environments



This cycle starts with the learners being exposed to information in digitally mediated settings, which have high informational density and multimodal representation. Such exposure requires active assessment, whereby learners can evaluate credibility, relevance and coherence of incoming information relative to known structures of information. Unlearning processes are triggered in the event of discrepancy or cognitive tensions. Unlearning refers to the critical re-examination of presumptions, interpretive practices and patterns of previously internalised knowledge that are not necessarily anymore functional within the changing informational situations.

After this revision process, relearning follows in the form of restructuring and consolidation of the new knowledge. Cognitive regulation, such as metacognitive monitoring, attentional control, and cognitive flexibility are helpful in relearning because they can allow learners to apply novel interpretations to more consistent and transferable knowledge structures. All these processes facilitate the processes of adaptation of learning methods where learners are able to adjust their strategies according to the demands of the context.

The model involves technology as the agent and facilitator of adaptive learning. Information access, interaction patterns and feedback processes are influenced by digital tools and, thus, affect how learners control cognition and restructure knowledge. Adaptive learning is therefore placed in the model as an outcome of recursive interactions between information exposure, cognitive regulation, knowledge revision and technologically mediated engagement.

The model offers a theoretical framework of how learners manage the digital learning paradox and how they maintain meaningful knowledge development in modern-day higher education contexts through a combination of learning, unlearning, and relearning into one adaptive cycle.

EDUCATORS AND INSTITUTIONS AS FACILITATORS OF LEARNING ADAPTABILITY

By implementing pedagogical modifications, educators and institutions in India are essential in promoting learning flexibility. One significant change is the transition from content delivery to competency- and skill-based education, which matches the changing demands of learners in the 21st century by prioritising the development of practical skills over the acquisition of information alone (Jain & Yadav, 2024). Using metacognitive and self-reflective techniques makes students more conscious of their learning processes and improves their capacity to adjust to new knowledge and difficulties (Dixit et al., 2024).

Additionally, creating individualised and adaptable curricula, which are frequently aided by AI-powered adaptive learning systems, allows for customised learning experiences that accommodate a range of learning requirements and styles (Cheng & Wang, 2023). In addition to enhancing learning outcomes, this strategy creates a more dynamic and adaptable learning environment, which is crucial for resolving India's digital learning conundrum (Alawneh et al., 2024). Viewing these patterns through a connectivist lens reveals that digital competencies are no longer just technical skills, but rather foundational elements required to sustain the lifelong learning paradigm in interconnected educational networks (Basit et al., 2025).

The promotion of lifelong learning is greatly aided by institutional policies, especially those pertaining to professional development programs (PDPs) and continuing professional development (CPD) for teachers. As evidenced by

faculty development studies that demonstrate increased pedagogical abilities and motivation among educators, these programs improve instructional methodologies and professional development (Adicheril, 2024; Mishra, 2024). Higher education must also include continuous learning modules since they support the National Education Policy's goal of revolutionising teacher preparation by encouraging lifelong professional growth (Misra, 2020). Additionally, encouraging interdisciplinary learning is crucial for overcoming the digital learning paradox since it fosters a comprehensive approach to education by fusing many fields to provide students transferable abilities (Mishra, 2024; Patra et al., 2024). Institutions can successfully support learning adaptation for both teachers and students by implementing these tactics. Consequently, the synthesized themes highlight that successful educational adaptation requires a holistic, competency-based framework, one that equally integrates cognitive flexibility, socio-emotional resilience, and practical application (Miglani et al., 2026).

In order to help 21st-century learners become more adaptive, collaborative learning environments are essential. According to Porkodi et al. (2023), collaborative learning techniques that favourably influence competence development in entrepreneurship programs demonstrate how peer learning and mentorship models improve critical thinking and communication abilities. By fostering immersive and design thinking pedagogies and encouraging transdisciplinary collaborations, community-based learning environments promote social innovation (Lake et al., 2021). Because they expose students to the real world and align education with industry demands, industrial relationships are essential for upskilling and knowledge renewal. This encourages ongoing learning and adaptation (Vallath et al., 2021). According to Fonseca and Zegers (2024), these collaborative ecosystems use digital platforms to establish communities of practice that improve participatory communication and change organisational cultures. Institutions and educators may successfully promote learning adaptation and make sure students are prepared to handle the digital learning paradox by incorporating such approaches.

CONCLUSION

This paper highlights how in the digital world of the 21st century, one must not only acquire new information, but also undergo a basic cognitive metacognitive transformation involving the synthesis, de-synthesis and re-synthesis of knowledge in order to cope with the modern digital environment. Thematic synthesis shows that the so-called digital learning paradox the accessibility of information and the inability to retain it is an issue that needs very specific tactics to control the cognitive load and ensure meaningful and profound engagement. Unlearning proved to be a very crucial though emotionally and cognitively demanding stage in which learners are forced to consciously unlearn the old mental

models in order to fit new paradigms. Relearning, on the other hand, with the help of neuroplasticity and growth mindset is the driver of the knowledge consolidation and skill renewal in a constantly varying technological environment.

The implications of the findings to educational stakeholders are huge. In the case of learners, success would lie in the ability to instill metacognitive self-regulation, and improved digital literacy, which would enable them to sift information. In line with the NEP 2020 of India, educators and institutions are under great pressure to shift towards adaptive and competency-based pedagogies as opposed to instructor-centred transmission. This entails adoption of flexible curriculums, interdisciplinary cooperation and AI-based personalization to cater to different learner profiles. The conceptual model of adaptive learning cycles suggested gives a theoretical framework that has underpinned these interventions in that technology is not just a tool, but a mediator of cognitive change.

Although this review provides an in-depth conceptual framework, it is constrained by the aspect that it was conducted on the existing literature as opposed to longitudinal empirical studies. The effectiveness of unlearning interventions in real-time, when used with different populations and within different environments, should be assessed in the future with the help of mixed-methods studies. Also, the idea of adapting models via AI may be further used to improve lifelong learning by exploring AI. To sum up, institutional innovation and integration with technology should support a culture of relentless unlearning and relearning, which may enable 21st-century learners to overcome the shocks of the fourth industrial revolution.

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