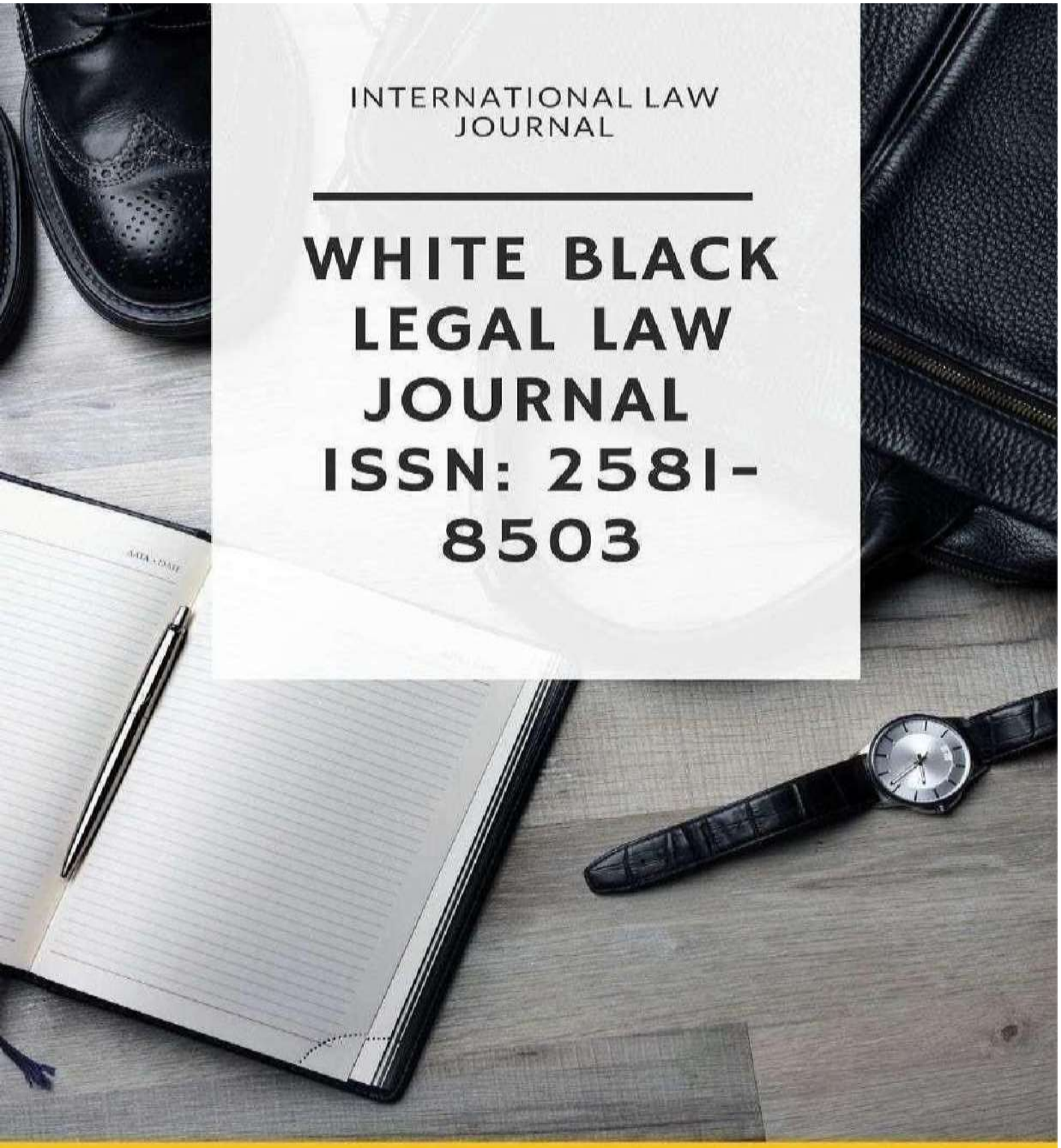

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ABOUT US

WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal provide dedicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

ARTIFICIAL INTELLIGENCE AND THE RIGHT TO EDUCATION: OPPORTUNITIES AND CHALLENGES UNDER THE INDIAN CONSTITUTION.

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ABSTRACT

The integration of Artificial Intelligence (AI) into education presents both unprecedented opportunities and pressing challenges for the realization of the Right to Education under Articles 21 and 21A of the Indian Constitution. While Indian jurisprudence, through cases such as Mohini Jain and Unnikrishnan, has expanded the scope of this right to include accessibility and quality, the advent of AI necessitates a re-examination of its constitutional dimensions. AI tools promise enhanced accessibility for marginalized students, personalized learning, inclusivity across linguistic and regional barriers, and improved efficiency in teaching and administration. However, these benefits are tempered by significant risks, including digital divide, algorithmic bias, privacy violations, over-commercialization of education, and regulatory gaps. A comparative study of global models—China's surveillance-based approach, Finland's ethical integration, and the United States' innovation-led but privacy-challenged system—provides critical insights for India's policy choices. The paper argues for a balanced model that leverages AI's potential while embedding safeguards rooted in equality, dignity, and inclusivity. It concludes with immediately implementable solutions such as bridging digital infrastructure gaps, regulating EdTech, empowering teachers, and enforcing child-specific data protections, ensuring that AI strengthens rather than undermines the constitutional promise of free and quality education.

Keywords

Artificial Intelligence in Education
Right to Education – Article 21A
Constitutional Law and Technology
Digital Divide and AI
NEP 2020 and EdTech Regulation

INTRODUCTION

Education occupies a unique place in the constitutional landscape of India, not only as a means of personal development but as a tool for social transformation and nation-building. It has been consistently recognised by the judiciary and policymakers as a foundational element of human dignity and an indispensable condition for the realisation of other rights. Article 21 of the Constitution, guaranteeing the right to life and personal liberty, has been interpreted expansively to include the right to live with dignity, and within this framework, the right to education has found its firm footing. The incorporation of Article 21A through the 86th Constitutional Amendment in 2002 explicitly guaranteed free and compulsory education for children between the ages of six and fourteen, crystallising what had earlier been read into Article 21. The Right of Children to Free and Compulsory Education Act, 2009, subsequently operationalised this constitutional promise, mandating the State to provide not merely access to schooling but also a framework ensuring equity and quality.

At the same time, the 21st century has ushered in rapid technological transformation, with Artificial Intelligence (AI) emerging as one of the most disruptive and promising innovations across sectors. The field of education, traditionally reliant on human interaction and pedagogy, has not remained untouched. Globally, AI is being integrated into educational systems in diverse ways: from intelligent tutoring systems and personalised learning platforms to administrative automation and predictive analytics. In India too, the push towards digital learning, accelerated by the COVID-19 pandemic, has highlighted both the potential and the perils of AI in reshaping access to education. National policy initiatives, particularly the National Education Policy (NEP) 2020 and the NITI Aayog's policy paper on AI, recognise AI as a powerful tool to democratise education and improve quality. Yet, the constitutional question remains: how does AI, as a technological instrument, align with the guarantees of the Right to Education under Article 21 and 21A?

This paper seeks to explore this intersection. It situates AI within the broader constitutional promise of education, examining both the opportunities it offers in advancing inclusivity, accessibility, and quality, and the challenges it poses in terms of equity, privacy, and regulation.

STATEMENT OF PROBLEM

The Right to Education under Articles 21 and 21A of the Indian Constitution guarantees every child access to free and quality education, yet the rapid integration of Artificial Intelligence (AI) into the education sector has created new constitutional, legal, and ethical dilemmas. While AI has the potential to enhance accessibility, personalization, and inclusivity, its unregulated use risks deepening the digital divide, perpetuating algorithmic bias, compromising student privacy, and commercializing education in ways that undermine equality and dignity. The absence of a clear legal framework in India to regulate AI in education, coupled with infrastructural disparities and inadequate safeguards for marginalized communities, raises critical concerns about whether technological advancement is truly advancing or inadvertently restricting the constitutional promise of education for all.

RESEARCH OBJECTIVES

- To analyze the constitutional and judicial interpretation of the Right to Education under Articles 21 and 21A in India.
- To examine the role of Artificial Intelligence in transforming educational delivery, accessibility, and quality.

RESEARCH QUESTIONS

- How has the Supreme Court of India interpreted the Right to Education under Articles 21 and 21A, and what constitutional obligations arise from these interpretations?
- In what ways is Artificial Intelligence currently being applied in the field of education globally and in India?

HYPOTHESES

- Artificial Intelligence, if properly regulated, can strengthen the constitutional guarantee of the Right to Education by enhancing accessibility, inclusivity, and quality.
- In the absence of adequate legal and policy safeguards, AI in education may widen the digital divide, reinforce inequality, and undermine the dignity component of Article 21.

RESEARCH METHODOLOGY

This research adopts a doctrinal and comparative methodology, analyzing primary sources such as the Indian Constitution (Articles 21 and 21A), landmark Supreme Court judgments (Mohini

Jain, Unnikrishnan, Society for Unaided Private Schools), and the Right to Education Act, 2009. Secondary sources include scholarly books, journal articles, government reports, policy documents such as NEP 2020, and international guidelines on AI in education (UNESCO, ICESCR, CRC). Comparative analysis is conducted by examining AI integration in education in countries like Finland, China, and the United States to draw lessons for India. The study also evaluates empirical evidence from EdTech platforms, AI-driven initiatives in Indian schools, and reports on accessibility, inclusivity, and digital infrastructure. This methodology enables a holistic understanding of how AI can both support and challenge the constitutional Right to Education, providing a basis for practical recommendations.

SCOPE AND LIMITATION

The scope of this research encompasses the constitutional, legal, and policy dimensions of the Right to Education under Articles 21 and 21A, with a focus on the integration of Artificial Intelligence in Indian schools and higher education. It examines opportunities, challenges, and comparative international practices to provide actionable recommendations. The study primarily relies on doctrinal analysis of legal texts, judicial pronouncements, policy documents, and secondary literature, supplemented by case studies of AI initiatives in India. However, the research is limited by the lack of extensive empirical data on long-term outcomes of AI in Indian classrooms and the rapidly evolving nature of AI technologies, which may result in some developments being beyond the scope of this study.

BACKGROUND OF RIGHT TO EDUCATION UNDER ARTICLE 21 AND 21A

The Indian Constitution originally treated education as a Directive Principle of State Policy under Articles 41 and 45, indicating its importance but without rendering it judicially enforceable. However, the judiciary, beginning in the 1980s, progressively expanded the scope of Article 21, holding that the right to life encompasses the right to live with human dignity, which in turn includes the right to education. In *Mohini Jain v. State of Karnataka (1992),* the Supreme Court first declared education as a fundamental right flowing directly from Article 21. This view was affirmed and refined in *Unnikrishnan J.P. v. State of Andhra Pradesh (1993),* where the Court held that every child has a right to free education up to the age of fourteen years, and thereafter, subject to economic capacity.

These judicial pronouncements paved the way for constitutional reform. The 86th Amendment of 2002 introduced Article 21A, making free and compulsory education for children aged six to fourteen years a fundamental right. The RTE Act, 2009, operationalised this amendment, setting out detailed norms relating to pupil–teacher ratios, infrastructure, curriculum, and the inclusion of disadvantaged groups. Together, Article 21 and Article 21A, read with Article 14 (equality) and Article 15 (non-discrimination), create a robust constitutional architecture that places education at the heart of India's democratic project.

EVOLUTION OF EDUCATION AS A FUNDAMENTAL RIGHT IN INDIA

The evolution of education as a fundamental right in India is closely linked with the broader expansion of socio-economic rights through judicial interpretation. From its modest beginnings as a directive principle, education acquired enforceability through judicial creativity and later through constitutional amendment. While the early cases stressed access to basic education, later decisions broadened the horizon, recognising that education must be of acceptable quality, equitable, and oriented towards full development of the individual.

For instance, in *Society for Unaided Private Schools v. Union of India (2012),* the Supreme Court upheld the validity of **Section 12(1)(c) of the RTE Act,** which mandates private unaided schools to reserve 25% of their seats for economically weaker sections. This ruling underscored that the constitutional right to education is not merely about enrolment, but about substantive equality and social integration. Education has thus moved from being a privilege to being seen as an entitlement, essential for achieving social justice and participatory democracy.

EMERGENCE OF ARTIFICIAL INTELLIGENCE IN EDUCATION: GLOBAL AND INDIAN CONTEXT

Against this constitutional backdrop, the emergence of AI poses both a challenge and an opportunity. Globally, countries like China, the United States, and Finland are experimenting with AI-driven personalised learning systems, smart classrooms, and predictive tools that adapt to student performance in real time. UNESCO and the OECD have highlighted AI as a transformative force capable of addressing teacher shortages, enhancing learning outcomes, and promoting inclusion for children with disabilities.

In India, AI has begun to penetrate the educational ecosystem through both state-led and private initiatives. Platforms such as **DIKSHA** and **SWAYAM,** backed by the Government of India, utilise digital technologies for widespread dissemination of educational resources. Private players like Byju's, Vedantu, and others have incorporated AI-driven analytics to personalise student learning experiences. The COVID-19 pandemic intensified this reliance, making digital platforms a necessity rather than an option. Recognising this, the NEP 2020 advocates the integration of AI and digital tools in classrooms, while NITI Aayog's policy papers stress the importance of AI for inclusive development.

Yet, the integration of AI into education in India is deeply shaped by constitutional considerations. While AI can potentially enhance accessibility and quality, it also risks reinforcing existing inequalities due to the digital divide. Issues of privacy, data protection, and algorithmic bias raise fundamental concerns about equality and dignity under Articles 14 and 21. Thus, the constitutional right to education must be re-examined in light of this technological transformation.

MEANING AND SCOPE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

Artificial Intelligence refers to computer systems designed to simulate human intelligence processes such as learning, reasoning, and problem-solving. In the field of education, AI encompasses a wide spectrum of tools that support teaching, enhance learning, and streamline administrative processes.[1] Globally, AI is being employed to overcome challenges of scale, shortage of trained teachers, and the need for personalised pedagogy. In India, where the educational system caters to over 250 million students,[2] the scope of AI lies in its ability to democratise access, address regional disparities, and empower differently-abled learners through assistive technologies.[3]

TYPES OF AI APPLICATIONS IN EDUCATION

AI applications in education can be broadly categorised into five major types, each contributing differently to teaching, assessment, administration, and accessibility:

[1] Stuart J. Russell & Peter Norvig, Artificial Intelligence: A Modern Approach 1–3 (4th ed. 2020).
[2] Ministry of Education, Gov't of India, Educational Statistics at a Glance 2022, at 12 (2022).
[3] UNESCO, Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development 7–8 (2019).

- **Adaptive Learning Platforms**

These systems analyse individual student performance and adapt the learning material to suit their pace, strengths, and weaknesses. For example, AI-driven platforms can provide easier problems for struggling students and advanced tasks for quick learners, thus reducing the "one-size-fits-all" approach. Adaptive platforms help ensure that each student progresses according to their learning curve, aligning with the constitutional idea of inclusive education.

- **AI Tutors and Intelligent Tutoring Systems**

Virtual tutors, powered by AI, simulate human teaching to provide additional academic support outside the classroom. They can clarify doubts, provide explanations in regional languages, and even assist in revision exercises. This holds special significance in India, where teacher shortages are acute, especially in rural and government schools.

- **Predictive Analytics**

AI systems can predict student outcomes by analysing attendance, participation, and performance data. Such analytics enable early identification of students at risk of dropping out and allow for timely intervention. Predictive tools can assist schools and policymakers in allocating resources effectively, thereby supporting the right to continuous and meaningful education.

- **Chatbots and Virtual Assistants**

Chatbots provide instant responses to student queries related to course content, schedules, and administrative matters. They help reduce dependency on overburdened teachers and administrators, ensuring that students receive timely guidance. In large universities or online education platforms, chatbots enhance efficiency and accessibility.

- **Automated Grading and Assessment Tools**

AI-driven systems can evaluate objective tests and, increasingly, subjective assessments such as essays. Automated grading reduces the time taken for evaluations and can provide detailed feedback, allowing teachers to focus on pedagogy rather than administrative workload. However, concerns of fairness, transparency, and algorithmic bias also accompany such systems.

Together, these applications demonstrate that AI is not merely a futuristic concept but a present-day reality shaping the educational ecosystem.

CONCEPT OF RIGHT TO EDUCATION IN THE INDIAN CONSTITUTION

The constitutional right to education in India has evolved through judicial interpretation and legislative enactment. Article 21 guarantees the right to life and personal liberty, expansively interpreted to include the right to live with dignity. Beginning with *Mohini Jain v. State of Karnataka*,[4] the Supreme Court recognised education as intrinsic to the right to life. This was clarified in *Unnikrishnan J.P. v. State of Andhra Pradesh*,[5] where the Court held that free education up to the age of fourteen is a fundamental right.

The 86th Constitutional Amendment of 2002 introduced Article 21A, mandating free and compulsory education for children aged six to fourteen. The Right of Children to Free and Compulsory Education Act, 2009 (RTE Act) operationalised this amendment.

In *Society for Unaided Private Schools v. Union of India*,[6] the Court upheld the validity of Section 12(1)(c) of the RTE Act, requiring private unaided schools to reserve 25% seats for disadvantaged children. Thus, the constitutional scheme extends beyond access to ensuring quality and equity.

LINKING AI AND RIGHT TO EDUCATION: BEYOND ACCESS TO QUALITY

The constitutional promise of education is not fulfilled merely by opening the gates of schools; it requires equity, inclusion, and quality. AI tools can help bridge learning gaps for children with disabilities, linguistic minorities, and those in remote areas, aligning with Article 21A. Similarly, adaptive learning and predictive analytics contribute to quality education, realising the dignity-based interpretation of Article 21.

However, unregulated use of AI risks exacerbating inequality and infringing privacy. If AI-based education remains limited to affluent communities, it would contradict Article 14 and Article 15 of the Constitution. Moreover, excessive data collection by AI tools may violate the right to privacy, an integral component of Article 21 recognised in *Justice K.S. Puttaswamy v.*

[4] Mohini Jain v. State of Karnataka, (1992) 3 S.C.C. 666 (India).
[5] Unnikrishnan J.P. v. State of Andhra Pradesh, (1993) 1 S.C.C. 645 (India).
[6] Society for Unaided Private Schools v. Union of India, (2012) 6 S.C.C. 1 (India).

Union of India.[7]

Thus, AI has the potential to advance but also to undermine the constitutional Right to Education. The challenge is reconciling innovation with equality and dignity.

CONSTITUTIONAL AND LEGAL DIMENSIONS

The Right to Education in India is deeply rooted in constitutional interpretation and international human rights law. Judicial expansion of Article 21, legislative interventions such as the Right of Children to Free and Compulsory Education Act, 2009, and international obligations under treaties and declarations together form the normative foundation of this right. With the advent of Artificial Intelligence (AI) in education, these legal dimensions gain renewed significance, as constitutional guarantees must be reconciled with technological transformations.

JUDICIAL INTERPRETATION OF THE RIGHT TO EDUCATION UNDER ARTICLE 21

The judiciary has been instrumental in transforming education from a directive principle to an enforceable fundamental right.

In *Mohini Jain v. State of Karnataka*, the Supreme Court held that the right to education is a fundamental right implicit in the right to life under Article 21. The Court reasoned that the dignity of an individual cannot be assured unless education is made accessible to all, and therefore, charging capitation fees by private medical colleges was unconstitutional.

This position was refined in *Unnikrishnan J.P. v. State of Andhra Pradesh*, where a Constitution Bench held that the right to education flows from Article 21 but is limited in scope. It declared that every child has the right to free education up to the age of 14 years, and thereafter, the right is subject to the State's economic capacity and development. The Court also devised a **"scheme"** directing private professional institutions to reserve seats for government nominees.

[7] Justice K.S. Puttaswamy (Retd.) v. Union of India, (2017) 10 S.C.C. 1 (India).

Later, in *Society for Unaided Private Schools v. Union of India*, the Court upheld the constitutional validity of Section 12(1)(c) of the Right to Education Act, which mandated 25% reservation in private unaided schools for children from economically weaker sections. This case cemented the principle that education must be equitable and inclusive, even within private institutions.

These judicial interpretations demonstrate that the right to education is not static but evolves to meet societal needs, which now includes responding to technological advances like AI in classrooms.

CONSTITUTIONAL OBLIGATIONS UNDER ARTICLES 14, 15, 19, 21, AND 21A

The Right to Education under Article 21A is reinforced by the equality and liberty guarantees in Part III of the Constitution:

- **Article 14:** Equality before law and equal protection of laws require the State to ensure non-discriminatory access to educational opportunities. AI deployment must therefore prevent digital divides and algorithmic bias.
- **Article 15:** Prohibits discrimination on grounds of religion, race, caste, sex, or place of birth. In education, this translates into affirmative duties to include disadvantaged groups, reflected in Section 12(1)(c) of the RTE Act.
- **Article 19(1)(a):** Protects freedom of speech and expression, which is enriched by education enabling meaningful participation in democracy. AI-driven platforms can expand this freedom through digital literacy but also raise censorship and surveillance concerns.
- **Article 21:** The right to life includes the right to live with dignity, encompassing the right to education of acceptable quality.
- **Article 21A:** Specifically obligates the State to provide free and compulsory education to all children aged six to fourteen years.

Together, these provisions establish a constitutional mandate that education must be accessible, equitable, and of quality, a mandate that any AI-driven educational system must uphold.

RIGHT TO QUALITY EDUCATION AS PART OF DIGNITY UNDER ARTICLE 21

The Supreme Court has repeatedly emphasised that the right to life under Article 21 means more than mere animal existence; it includes the right to live with dignity. Education, as recognised in Unnikrishnan and subsequent cases, is a critical component of this dignity.

The Court in *Avinash Mehrotra v. Union of India*[8] held that children have the right to receive education in a safe environment, linking quality and safety standards to Article 21. Similarly, in *Environmental & Consumer Protection Foundation v. Delhi Administration*[9], the Court directed the State to provide basic infrastructure such as drinking water, toilets, and playgrounds, declaring them integral to the right to education.

By extension, quality education today requires not only physical infrastructure but also digital and technological infrastructure. If AI is to be integrated into classrooms, its deployment must enhance quality while respecting constitutional values of dignity, equality, and non-discrimination.

INTERNATIONAL LEGAL FRAMEWORK

India's constitutional jurisprudence on education is influenced by international human rights law:

- **Universal Declaration of Human Rights (UDHR),** Article 26, recognises education as a fundamental human right, free and compulsory at least at elementary levels.
- **International Covenant on Economic, Social and Cultural Rights (ICESCR),** Articles 13–14, obligate States to provide free primary education and progressively accessible secondary and higher education.
- **Convention on the Rights of the Child (CRC),** Article 28, requires States to recognise the right of every child to education on the basis of equal opportunity.
- **UNESCO Declarations**: UNESCO's 2019 Beijing Consensus on Artificial Intelligence and Education highlights both the opportunities and risks of AI in advancing equitable education.[10]

  India, as a party to these instruments, must harmonise its constitutional obligations with

[8] Avinash Mehrotra v. Union of India, (2009) 6 S.C.C. 398 (India).
[9] Envtl. & Consumer Prot. Found. v. Delhi Admin., (2012) 10 S.C.C. 197 (India).
[10] Universal Declaration of Human Rights art. 26, G.A. Res. 217A (III), U.N. Doc. A/810 (Dec. 10, 1948).

its international commitments, ensuring AI-based education does not exacerbate inequality but strengthens inclusivity.

NATIONAL EDUCATION POLICY (NEP) 2020 AND GOVERNMENT POLICIES ON AI IN EDUCATION

The NEP 2020 represents a paradigm shift in India's educational landscape. It emphasises holistic, flexible, multidisciplinary learning and explicitly acknowledges the transformative role of technology, including AI.[11] The policy advocates:

- **Use of AI to enhance teaching, assessment, and administration.**
  Establishing a National Educational Technology Forum (NETF) to provide a platform for free exchange of ideas on technology-driven education.
- **Leveraging AI to address disparities in access and promote inclusive education.**
  The Government of India, through NITI Aayog's National Strategy for Artificial Intelligence (2018), also identifies education as a priority sector for AI integration, focusing on improving learning outcomes, teacher training, and access for disadvantaged students.[12]
  However, these policies remain largely aspirational. Without clear regulatory safeguards addressing privacy, equity, and accountability, AI in education risks undermining constitutional guarantees rather than advancing them

OPPORTUNITIES OF AI IN STRENGTHENING THE RIGHT TO EDUCATION

Artificial Intelligence (AI) has emerged as one of the most transformative forces in education worldwide. For India, where the constitutional Right to Education under Articles 21 and 21A is intertwined with issues of equity, access, and quality, AI presents both opportunities and challenges. If deployed ethically and inclusively, AI can act as a powerful tool to advance the constitutional promise of free and quality education for all children. This section examines the specific opportunities AI offers in the Indian context, focusing on accessibility, personalisation, inclusivity, efficiency, and expansion, along with case studies of AI-driven initiatives.

[11] Ministry of Education., Gov't of India, National Education Policy 2020, 23.5–23.7 (2020).
[12] NITI Aayog, National Strategy for Artificial Intelligence 49–53 (2018).

ACCESSIBILITY: AI TOOLS FOR DISABLED CHILDREN

A fundamental constitutional and human rights concern is the education of children with disabilities. Despite legislative backing through the **Rights of Persons with Disabilities Act, 2016,** accessibility remains a persistent barrier.[13] AI-based assistive technologies have opened new pathways for inclusion:

- **Speech-to-Text and Text-to-Speech Tools:** These allow children with hearing impairments or visual disabilities to access classroom instruction and written materials in real time. Tools such as **Google's Live Transcribe or Microsoft's Seeing AI** are already being used in Indian classrooms.[14]
- **AI-Powered Assistive Devices:** Wearables and apps can convert spoken language into sign language or braille, thereby enabling participation in mainstream classrooms.
- **Predictive Assistance:** AI can anticipate a learner's difficulty and provide customised support, helping children with learning disabilities like dyslexia or ADHD.

Such tools directly advance the constitutional mandate under Article 21A by ensuring that disability is not a barrier to free and compulsory education.

PERSONALISATION: ADAPTIVE LEARNING FOR INDIVIDUAL STUDENT NEEDS

Indian classrooms often suffer from overcrowding and teacher shortages, leading to a "one-size-fits-all" approach. AI enables adaptive learning, where platforms assess a student's performance and adjust the pace, style, and content accordingly.

- **Data-Driven Customisation:** Platforms such as **BYJU'S and Toppr** already employ AI to tailor lessons to students' progress.[15] If integrated into government schools, these systems could help struggling learners keep pace while also challenging advanced students.
- **Intelligent Tutoring Systems (ITS):** These simulate one-on-one tutoring, identifying weak areas and providing extra practice without replacing teachers.
- **Feedback Loops:** AI allows real-time feedback to students, parents, and teachers, making learning more responsive and engaging.

Personalisation also aligns with the Supreme Court's recognition in *Unnikrishnan J.P. v.*

[13] The Rights of Persons with Disabilities Act, No. 49 of 2016, INDIA CODE.
[14] Google, Live Transcribe, https://www.android.com/accessibility/live-transcribe
[15] Byju's, Personalised Learning with AI, https://byjus.com

State of Andhra Pradesh, that education must be meaningful and not merely formal.

INCLUSIVITY: LANGUAGE TRANSLATION AND BRIDGING REGIONAL BARRIERS

India's linguistic diversity often becomes a barrier to equal education. While Article 350A of the Constitution directs the State to provide primary education in mother tongues, practical implementation remains uneven. AI can help bridge this gap:

- **Real-Time Translation Tools:** AI-powered platforms like Google Translate and Microsoft Translator are increasingly capable of handling Indian languages, enabling real-time classroom translation.
- **Content Localisation**: AI can adapt study material across 22 scheduled languages, allowing children from different states to learn in their preferred language.
- **Speech Recognition for Regional Dialects:** Ongoing projects aim to train AI systems in Indian dialects to ensure inclusivity for tribal and rural communities.[16]

By lowering linguistic barriers, AI fosters inclusivity, aligning with Articles 14 and 15, which prohibit discrimination on grounds of language or caste.

EFFICIENCY: REDUCED TEACHER WORKLOAD AND DATA-DRIVEN INSIGHTS

Teachers in India often spend more time on administrative tasks than on teaching. AI can ease this burden:

- **Automated Grading**: AI can evaluate objective answers and even essays, saving time for teachers to focus on interactive pedagogy.
- **Predictive Analytics:** By analysing attendance, test performance, and participation, AI can flag students at risk of dropping out, which is crucial in rural areas.
- **Classroom Management Tools:** AI systems can track student engagement and suggest interventions to improve learning outcomes.

Such efficiency is consistent with the constitutional obligation of the State to provide not just access but also quality education under Article 21.

[16] Indian Institute of Technology–Madras, AI for Speech Recognition in Indian Languages (2022).

EXPANSION: REMOTE LEARNING AND ACCESS IN RURAL/REMOTE AREASS

A persistent challenge in India is bridging the urban–rural education divide. AI-powered remote learning platforms can provide quality content to students in remote and marginalised communities:

- **AI-Powered Remote Classrooms:** Initiatives like PM eVIDYA and DIKSHA already integrate AI for personalised delivery of e-content.[17]
- **Offline AI Solutions:** For regions with limited internet, AI-driven apps can be preloaded on devices and used without continuous connectivity.
- **Low-Cost Hardware with AI:** Partnerships with companies like Intel and IBM are exploring affordable AI solutions for rural schools.

During the COVID-19 pandemic, AI-enabled platforms were instrumental in continuing education despite school closures, demonstrating their expansion potential.[18]

CASE STUDIES: AI-DRIVEN PROJECTS IN INDIAN SCHOOLS AND UNIVERSITIES

Several Indian initiatives highlight the potential of AI in advancing education:

- **Intel and CBSE's AI Curriculum (2019):** Introduced AI literacy for classes 8–10 students under CBSE.
- **IBM's AI in Education Program (2020):** IBM partnered with states like Telangana and Andhra Pradesh to roll out AI-powered learning.
- **NITI Aayog's ATL AI Modules (2020):** As part of the Atal Innovation Mission, NITI Aayog launched AI modules for Atal Tinkering Labs across India.
- **Project Khudkaar (Maharashtra):** Local NGOs and EdTech companies introduced AI-driven personalised learning in rural schools.[19]
- **Amity University's AI-Driven Assessments:** Amity has implemented AI in higher education for personalised evaluation and smart classrooms.

These case studies demonstrate that AI is no longer futuristic but a present reality in Indian education. The challenge is scaling such initiatives across government schools to benefit disadvantaged children.

[17] Ministry of Education, Govt. of India, PM eVIDYA (2020).
[18] UNICEF, AI and Predictive Analytics to Prevent School Dropouts (2020).
[19] Project Khudkaar, Maharashtra NGO Report (2022).

CHALLENGES AND RISKS OF AI IN EDUCATION

While Artificial Intelligence (AI) offers transformative opportunities for advancing the constitutional mandate of education under Articles 21 and 21A of the Indian Constitution, it also presents profound risks. If left unaddressed, these risks could undermine the goals of inclusivity, accessibility, and quality education. The challenges are multi-dimensional—ranging from the digital divide to algorithmic bias, privacy concerns, commercialisation, and regulatory gaps. A comparative perspective with countries such as China, Finland, and the United States underscores both the promises and pitfalls of AI in education.

1. **Digital Divide: Affordability and Infrastructure Gaps**

   The foremost challenge is the digital divide between urban and rural areas, rich and poor, and government versus private schools. AI-powered platforms rely heavily on internet access, electricity, and devices such as tablets or laptops. In India, where nearly 30% of rural households lack electricity and over 40% of students have no internet access, AI-based education risks deepening inequality.

   During the COVID-19 pandemic, while private schools in urban centers swiftly moved to AI-enabled online platforms, millions of rural students were left behind due to lack of access to devices and reliable connectivity. Initiatives like PM eVIDYA and DIKSHA sought to bridge the gap, but infrastructure remains a bottleneck.[20]

   Affordability is another dimension: AI-driven educational apps such as BYJU'S or Vedantu often require costly subscriptions, which are unaffordable for low-income families. Without State support and public investment, AI threatens to exacerbate rather than reduce educational inequities.

2. **Bias and Discrimination: Algorithmic Inequities**

   AI systems are only as fair as the data on which they are trained. In education, algorithmic bias can reinforce existing inequalities, particularly against marginalized groups such as Scheduled Castes, Scheduled Tribes, minorities, and girls.

   For instance, predictive analytics that assess "student potential" may inadvertently use biased datasets, leading to discriminatory academic streaming or resource allocation. In the U.S., studies have shown racial bias in AI-based grading systems, where minority students received systematically lower scores. If applied in India without safeguards,

[20] National Sample Survey Office (NSSO), Household Consumption on Education in India (2020).

similar risks could manifest along caste or linguistic lines.

Algorithmic bias also affects linguistic inclusivity. Many AI systems are trained on English or Hindi datasets, marginalizing students from tribal or regional language backgrounds. This not only violates the constitutional principles of equality (Articles 14 and 15) but also undermines Article 350A's directive for mother-tongue education.

3. Privacy and Surveillance: Student Data Collection

AI in education often relies on massive data collection, including student attendance, performance metrics, behavioral patterns, and even biometric data in some pilot programs. While such data can improve personalization, it also raises concerns about privacy, consent, and misuse.

India currently lacks a comprehensive data protection framework for children in educational settings. The Digital Personal Data Protection Act, 2023 provides general safeguards, but it does not specifically regulate EdTech companies collecting sensitive information from minors.[21]

Internationally, concerns have arisen over AI-enabled surveillance in classrooms, such as facial recognition systems in China to monitor student attentiveness. Critics argue that such practices create a climate of fear, reduce creativity, and violate children's right to dignity and autonomy. In India, unregulated surveillance could conflict with the Supreme Court's recognition of privacy as a fundamental right under Article 21 in *K.S. Puttaswamy v. Union of India.*[22]

4. Commercialisation of Education: EdTech and Privatization

Another major risk is the commercialisation of education through EdTech companies. AI-driven platforms are primarily developed by private corporations, whose profit motives may overshadow educational goals. Subscription-based models create a two-tier system: quality AI education for the rich and under-resourced government schools for the poor.

This trend runs counter to the constitutional vision of education as a public good. The Supreme Court in Society for Unaided Private Schools v. Union of India upheld the principle that private schools must also share the burden of the Right to Education.

[21] The Digital Personal Data Protection Act, No. 22 of 2023, INDIA CODE.
[22] K.S. Puttaswamy v. Union of India, (2017) 10 SCC 1 (India).

However, with AI being dominated by private actors, there is a danger of creating digital monopolies.

Moreover, reliance on private EdTech increases risks of consumer exploitation, such as misleading advertisements, aggressive marketing to parents, and hidden costs. The lack of strong consumer protection in the AI-EdTech sector exacerbates the problem.

5. **Quality Concerns: Over-Reliance on Technology**

While AI enhances efficiency, over-reliance on it risks eroding the human dimension of education. Education is not merely transmission of knowledge but also development of critical thinking, values, and social skills through teacher-student interaction.

AI tutors or automated grading cannot replicate empathy, mentorship, or moral guidance that teachers provide. Excessive automation risks reducing education to mechanical skill acquisition, undermining the holistic vision of education under the National Education Policy (NEP) 2020.[23]

There is also the problem of content quality: AI-generated recommendations may prioritize efficiency over depth, leading to superficial learning. In addition, AI systems are vulnerable to errors, technical glitches, or manipulation, raising questions about reliability.

6. **Regulatory Gaps: Absence of AI-Specific Legal Framework**

India currently lacks a comprehensive legal framework to regulate AI in education. While NEP 2020 emphasizes integrating AI, it does not provide guidelines on ethics, accountability, or redress mechanisms in case of harm.

Globally, UNESCO has adopted the Recommendation on the Ethics of Artificial Intelligence (2021), calling for human rights–based regulation. The **European Union's AI Act (2023)** designates education-related AI systems as "high-risk," requiring strict oversight. India, however, has yet to adopt such sector-specific regulation.

Without a regulatory framework, issues such as bias, data misuse, child protection, accountability for errors, and equitable access remain unresolved. The absence of enforceable safeguards undermines the constitutional promise of equality and dignity in education.

[23] Ministry of Education, NEP 2020 Implementation Handbook (2021).

COMPARATIVE ANALYSIS: CHINA, FINLAND, AND THE UNITED STATES

CHINA

China has aggressively deployed AI in classrooms, including facial recognition cameras to monitor student attentiveness and mood. While this demonstrates technological advancement, it has been criticized for violating children's privacy and autonomy. China's centralised governance allows rapid adoption, but at the cost of personal freedoms. India must be cautious not to replicate such surveillance-oriented models.[24]

FINLAND

In contrast, Finland adopts a human-centered AI model, focusing on ethical guidelines, teacher empowerment, and student well-being. AI tools are used as supportive aids rather than surveillance instruments. Finland emphasizes teacher autonomy, ensuring that AI does not replace but complements pedagogy. This offers a valuable model for India's constitutional vision of dignity and inclusivity.[25]

UNITED STATES

The U.S. demonstrates both innovation and challenges. AI-powered tools like Knewton and Coursera have advanced personalized learning. However, the U.S. has also faced lawsuits against EdTech firms for student data breaches and privacy violations. Regulatory oversight is fragmented, with federal and state laws varying in scope. India can learn from these experiences by adopting a uniform, rights-based AI framework for education.[26]

CONCLUSION

Artificial Intelligence has emerged as both a promise and a peril for the Indian education system. On one hand, it holds the potential to democratize education by making learning more accessible, personalized, inclusive, and efficient, directly advancing the constitutional guarantee of free and quality education under Articles 21 and 21A. On the other hand, if introduced without safeguards, AI risks deepening the digital divide, reinforcing social inequalities, infringing upon privacy, and commercializing education at the cost of its character

[24] Human Rights Watch, China: Education Surveillance Raises Rights Concerns (2019).
[25] Finnish Ministry of Education, AI in Education Strategy (2020).
[26] Center for Democracy and Technology (CDT), Student Privacy Lawsuits against EdTech Firms in the U.S. (2022).

as a public good.

The Indian judiciary has repeatedly held that the Right to Education is not merely about access but about meaningful and quality education (Mohini Jain, Unnikrishnan, Society for Unaided Private Schools). In the age of AI, this interpretation must evolve to include equitable access to technology-driven education without compromising constitutional principles of equality, dignity, and inclusivity.

Globally, experiences vary: China's surveillance-heavy AI model raises human rights concerns, while Finland shows how ethical and human-centered AI can complement pedagogy. The United States offers lessons on innovation alongside data privacy challenges. India's path must be a balanced model—harnessing AI's potential while embedding strong legal, ethical, and constitutional safeguards.

Thus, the way forward lies not in rejecting AI, but in regulating, democratizing, and ethically deploying it to ensure that technology enhances, rather than undermines, the constitutional promise of education for every child.

SUGGESTIONS

Here are clear, actionable steps that policymakers, schools, and institutions can adopt right away:

1. **Bridging the Digital Divide**

   Provide low-cost AI-enabled tablets or devices in government schools, preloaded with offline AI learning apps.

   Expand public digital infrastructure under PM eVIDYA, DIKSHA, and BharatNet to guarantee internet access in rural schools.

   Public–Private Partnerships (PPPs) with EdTech firms should be mandated to offer free versions of AI learning tools for low-income students.

2. **Ensuring Inclusive and Bias-Free AI**

   Mandate Indian language datasets in AI training to ensure accessibility across linguistic diversity.

   Introduce regular audits of AI algorithms by independent educational and ethical review

boards to prevent caste, gender, or regional bias.

Promote AI tools tailored for students with disabilities (speech-to-text, braille converters, assistive devices) through government subsidies.

3. **Safeguarding Privacy and Data Protection**

Enforce special child-data protection rules under the Digital Personal Data Protection Act, 2023, specifically for EdTech platforms.

Make informed parental consent mandatory for any AI-based student data collection.

Ban or strictly regulate AI-based surveillance tools (e.g., facial recognition in classrooms) that threaten children's dignity and autonomy.

4. **Preventing Over-Commercialisation of Education**

Require EdTech companies to cap subscription costs for AI learning platforms used in schools.

Introduce government licensing for EdTech firms to ensure compliance with educational and child rights standards.

Strengthen consumer protection laws against exploitative advertising and hidden charges in EdTech subscriptions.

5. **Empowering Teachers alongside AI**

Organize AI-literacy training programs for teachers to integrate technology effectively without replacing human mentorship.

Ensure AI platforms function as supportive tools, not substitutes, keeping the teacher-student relationship central.

Provide incentives for teachers who adopt blended learning models (AI + classroom teaching).

6. **Creating a Legal-Policy Framework for AI in Education**

Draft an AI in Education Code of Ethics under NEP 2020, aligned with UNESCO's 2021 AI Ethics Recommendation.

Designate education-related AI as "high-risk" (similar to EU's AI Act) requiring transparency, accountability, and human oversight.

Establish a National AI-Education Regulatory Authority (NAIERA) to oversee safety, equity, and fairness in EdTech deployment.

AI has the power to transform India's education landscape, but without ethical, legal, and constitutional guardrails, it could just as easily deepen divides and compromise rights. By adopting practical solutions today—bridging the digital divide, protecting data, curbing commercial exploitation, empowering teachers, and introducing robust regulation—India can ensure that AI strengthens rather than undermines the Right to Education.

In doing so, India will not only uphold its constitutional mandate but also set a global example of how technology can be harmonized with justice, dignity, and equality in education.

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