IMPACT OF AI ON ARCHITECTURE EDUCATION WITH RESPECT TO NEP 2020

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Abstract

Artificial Intelligence implementation in India in architectural education is compliant with the national education policy (NEP) 2020 and is innovative, accurate, and sustainable in terms of design. IIT Roorkee, SPA Delhi, and CEPT University are among the leading institutions that have embraced AI in computational design, sustainability simulations and urban analytics. In spite of this, problems like inadequate infrastructure, faculty expertise and redesigning curriculums to name a few prevent mass adoption. This NEP 2020 opens up a possibility to incorporate the use of AI into the educational process in India allowing to shape the training program in which cross-disciplinary training will be undertaken, and sustainable actions maintained. To make AI maximize its potential in teaching architecture, the government, schools, and the private sector should collaborate. It should also aim at its adaptation to India culture or environment, ethical issues, and interaction with industry, among others. The effective application of AI will contribute to redesigning architectural education, which will become innovative, sustainable, and open.

Keywords: *AI in architecture, NEP 2020, interdisciplinary learning, sustainability, curriculum redesign.*

1. INTRODUCTION

Artificial Intelligence is a tremendous opportunity and challenge included in architecture education. Artificial intelligence is transforming architecture through changes in the way things are designed, tested and verified, making the process of designing buildings faster and more creative. The NEP 2020 provides an interdisciplinary approach to learning by introducing technology and innovative methods of pedagogy (Kalyani, 2020). AI is in line with the aims of the NEP due to the fact that it has served to advance the prospects of the conventional architecture education as the students have been able to tap into the latest technologies and tools.

Architectural education is already incorporating AI at Indian institutes such as IIT (Indian Institute of Technology) Roorkee, SPA (School of Planning and Architecture) Delhi, and CEPT (Centre for Environmental Planning and Technology) University in such aspects as computational design or sustainability simulations (Waghmare et al., 2024; Jose & Kumar, 2025). AI is not only helping to automate routine tasks but also analyze better and provide individual learning experiences. Since the NEP 2020 demands education in general to be redesigned to allow preparing students to navigate in the digital world, AI is going to be a pivotal factor in transforming the architectural study in India (Korada, 2023; Aithal & Aithal, 2020). Thus, advancing architecture education in India also requires the introduction of AI, which represents the overall NEP 2020 agenda (Mandavkar, 2025).

Also, the NEP discusses the need to redress the value education and the education of teachers, which are also influenced by the application of AI in teaching (Dar & Jan, 2023; Gupta, 2024). In that regard, the use of AI is not only an automation tool but also an instrument of overall educational framework improvement (Aithal & Aithal, 2020; Varma & Jafri, 2021).

Review objectives:
- To improve understanding of the situation with AI integration in architecture in India.
- To review documentation of the issue of Indian institutions in implementing AI in architecture education, and offer solutions to the problems.
- To investigate the AI relevance in the pursuance of NEP 2020 visions in innovation, sustainability, and research-based architectural education.

2. National Education Policy (NEP) 2020: An Overview
2.1 Key Provisions and Focus on Technology

The NEP 2020 is concerned with involvement of technology in educational sector safeguarding cultural values (Mohanty, 2020). It promotes the AI and new technologies that can advance the creativity, particularly in architecture. Multidisciplinary approach will be proposed within the policy, which requires combining the past knowledge with digital technologies to become innovative and sustainable (Mohanty et al., 2024).

2.2 Impact on Teacher Education

NEP 2020 focuses on the development of teachers, and universities should prepare educators with the digital capabilities needed to provide AI in the field of architecture learning. This endorses the use of AI to bring new modes of teaching that improve performance in teaching and learning (Das, 2025; Kadam et al., 2024).

3. AI in Architecture Education: A Global Perspective
3.1 Global Trends in AI and Architecture

The domain of architectural education uses AI to enhance the advanced simulation, creativity, and automate tasks. Architectural processes have been redefined with the help of such tools as generative design, parametric modeling, and BIM. These tools have been implemented in the curriculum in global institutions that foster data-driven design and planning of cities (Goswami & Sharma, 2024). Table 1 demonstrates a comparison of these AI tools and their application.

Table 1: AI Tools in Architecture Education

AI Tool	Use in Architecture	Institutions Using It	Example Projects
Generative Design	Design optimization and automation	IIT Roorkee, SPA Delhi	Adaptive building design
BIM (Building Information Modeling)	Digital modeling and simulation	CEPT University	Urban development
Parametric Design	Design creation using algorithms	IIT Roorkee	Complex geometry designs

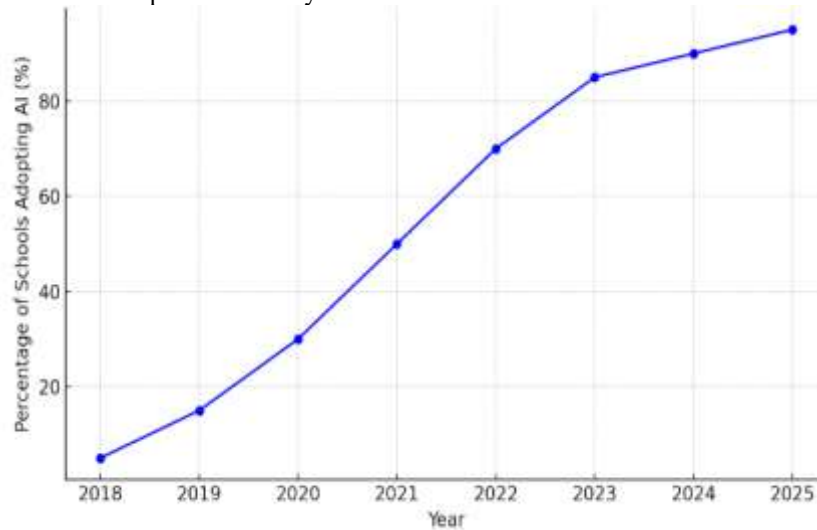Figure 1 shows the trend of AI adoption over the years in Indian institutions.

Figure 1:AI Adoption in Indian Architecture Schools (2018-2025)

3.2 Indian Context

The use of AI in architecture education in India is on the rise and institutions such as IIT Roorkee and SPA Delhi teach courses on computational design and smart cities (Sihag, 2024). Through AI tools, students are able to visualize what they are designing and be able to simulate scenarios that can be adopted in a real-world setting encouraging sustainable and efficient solutions.

4. Review of Indian Literature on AI in Architecture Education

Figure 2 illustrates how AI tools can be integrated into the architecture curriculum at various stages.
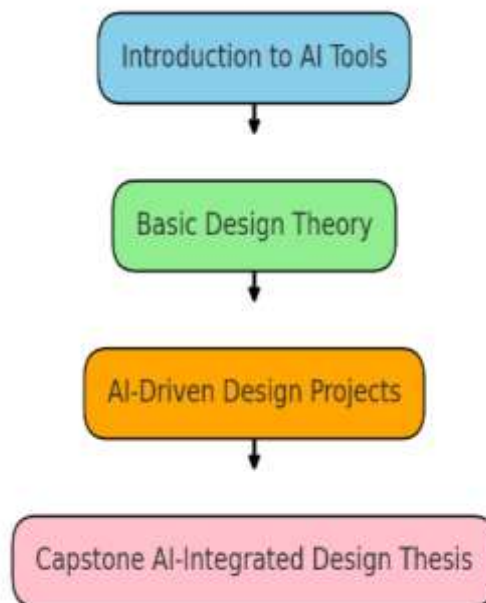

Figure 2:Curriculum Integration Flowchart

4.1 Scholarly Contributions

Researchers, such as Garg et al. (2024), in India have discussed how AI affects the education of architecture students and how AI systems can increase, or even change, the way thoughts are processed, or problems are solved. AI fosters the critical approach and the better knowledge of the environmental variables such as energy efficiency and resource optimization (Adenekan, 2020).

4.2 Curriculum Development and Pedagogical Shifts

In architecture education, Singh & Ozarkar (2025) wrote about how animation and simulation can help make an architectural unit shift in pedagogical approach, especially in design education. This is in tandem with NEPs point of ensuring innovation and imaginative approaches to learning incorporating most advanced technologies.

5. AI and Its Alignment with NEP 2020

The NEP 2020 is focused on interdisciplinary learning, education based on research, and sustainability. AI has been put at the center of facilitating these goals in the field of architecture education as it promotes the inclusion of other disciplines, innovation and sustainable practices.

Table 2 provided below shows the ways AI can fit into the NEP 2020 objectives:

Table 2: NEP 2020 Goals vs AI Applications

NEP 2020 Goal	AI Application in Architecture Education	References
Multidisciplinary Curriculum	AI enables integration across design, engineering, and urban planning, promoting interdisciplinary learning.	Kalyani (2020), Suresh (2024)
Enhancing Research and Innovation	AI drives data-driven design, sustainable architecture, and urban analytics, advancing architectural research.	Aithal & Srinivasan (2024), Goswami & Sharma (2024)
Encouraging Sustainable Practices	AI helps optimize energy-efficient designs and supports sustainable urban planning, aligning with NEP's sustainability goals.	Waghmare et al. (2024), Goswami & Sharma (2024)

5.1 Curricular Flexibility and Multidisciplinary Approach

The NEP 2020 underlines the need to develop multidisciplinary and flexible curriculums. AI perfectly fits in this vision, offering students a set of tools through which they can combine knowledge between engineering, urban planning, and environmental science. Simulation and analysis of architectural designs in AI will fit into the vision of NEP to build a knowledge-based society (Sangeet, 2024; Draft & Cheque, 2024).

5.2 Sustainability and Research-Driven Education

The aspects of sustainability that AI may foster correspond to the NEP vision of developing a sustainable education system based on research and resolving real-life problems. Students can use AI tools to make their design energy-efficient and simulate the effect of architecture choices to the environment (Goswami & Sharma, 2024).

Discussion

There is a great potential of such a development of introducing AI in Indian architecture education, but the problems still exist. In their study, Singh & Ozarkar (2025) emphasize the use of AI in the context of improving problem-solving and contributing to real-time simulations and dynamic feedback. Nevertheless, Gupta et al. (2020) single out infrastructure and faculty training as some major impediments to complete integration. The literature has exposed the discrepancy between the vision of the use of technology envisaged by NEP 2020 and the reality on the ground in the architecture schools. Misra et al. (2024) note that there is a necessity to invest in digital infrastructure and faculty development more. According to Suresh (2024), it is necessary to pay attention to the ethical implications of AI, especially during the construction of buildings in India. Future studies need to be based on ways of aligning AI instruments with the Indian culture and the Indian environments, where AI is not just a replica of the western design patterns. Also, Aithal and Srinivasan (2024) demand that the collaborations between architecture schools and providers of AI-associated technology should be more robust to provide equal access to AI tools to both students and faculty.

Conclusion

Incorporation of AI in architectural education in India is one such game changer that goes in line with NEP 2020. AI contributes to the automation, efficiency and innovation in architectural design and, therefore, it is a tool of the future of architectural learning. The major universities such as IIT Roorkee, SPA Delhi and CEPT University are embracing AI to be used in computational design, sustainability simulations as well as urban analytics. However, the poor infrastructure, untrained faculty and archaic curricula act as a culprit to wide adoption. To resolve these problems, one will need to invest in digital infrastructure, development of faculty, and revision of curriculums. The NEP 2020 will provide a chance to combine AI with the education and culture of India, facilitating the interdisciplinary learning and sustainability. The cooperation between the government, educational institutions and the private sector is rather crucial to make AI reach its potential. The future areas of research look into adapting AI tools to the Indian application into architecture, ethical issues, and opportunities to improve the industry-academia collaborations. With apt investments and work, AI will transform the architecture curriculum in India, making students versed enough to design sustainable and innovative architectural solutions.

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