



Pedagogical integration of AI: Strategies of effective classroom implementation

22/01/2025 | CIET-NCERT, New Delhi

Learning Objective: Teachers will be able to design and justify a subject-specific instructional plan that integrates AI-driven inquiry strategies.



Session content

01

NEP 2020 – Policy Direction

What NEP 2020 says about integrating AI in teaching and learning?

02

The Core Philosophy: “Human-in-the-loop”

Improving overall efficiency of the ecosystem

03

Pedagogy: From theory to practice

Subject wise and grade wise strategies

04

Ethical integration

Safeguards to be considered for integration

NEP 2020 and AI Mandate

The National Education Policy (NEP) 2020 provides the philosophical and structural scaffolding for this transformation. It is the first education policy in India's history to explicitly articulate the intersection of technology, pedagogy, and employability in the context of AI. It acknowledges that the global ecosystem is moving towards an era where Artificial Intelligence, Machine Learning (ML), and data science will be ubiquitous.

Para 23.8

Para 4.24

Para 4.25

Intersection of Policy and curricular goals aligned to AI

NEP 2020

NCF-SE 2023

Technology-Enabled Classroom

Coding & Computation Thinking

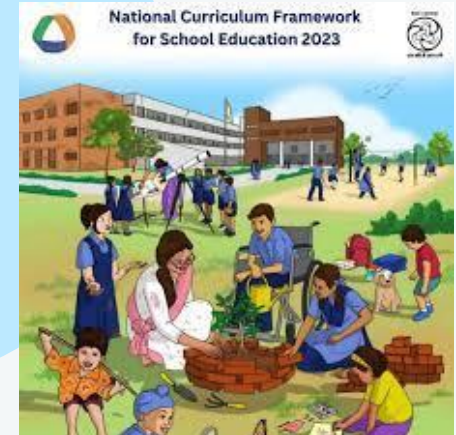
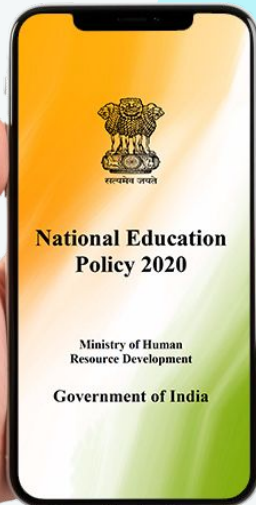
Multilingual, Inclusive Content

Personalized learning pathways

Competency-based education

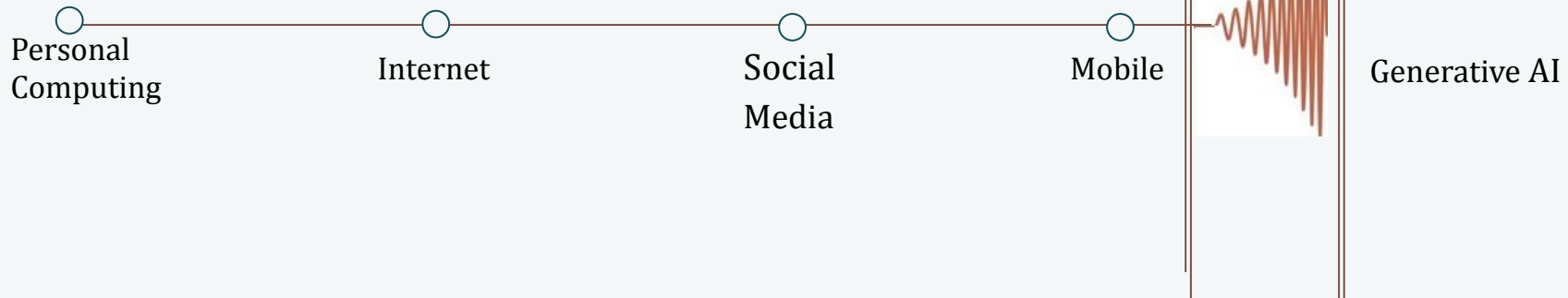
Cross-Curricular Integration

Teacher Professional Development



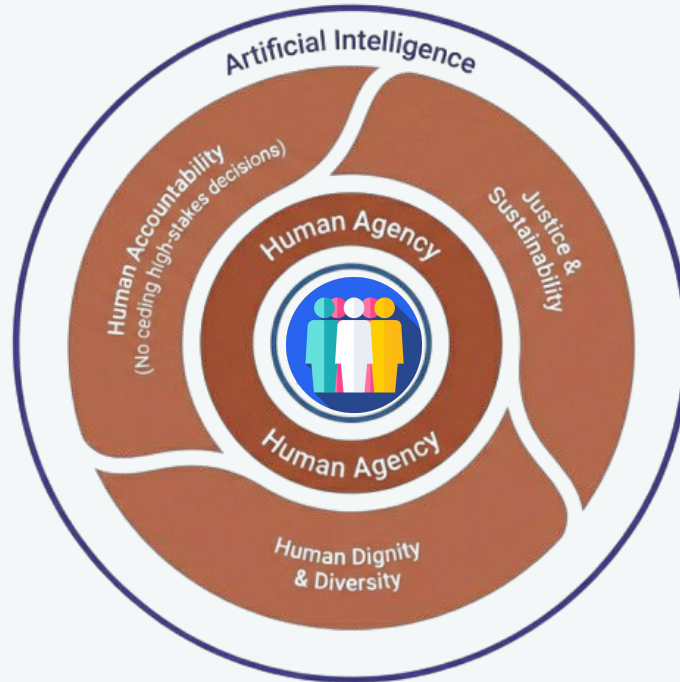
The unrelenting pace of AI revolution

We have witnessed four digital revolutions in rapid succession: Personal Computing, the Internet, Social Media, and Mobile. However, the AI revolution is distinct. It challenges the “linchpin of civilization”—language. AI functions as an “oracle,” simulating conversation and knowledge production.



The Core Philosophy: A Human Centred Approach

Before defining curriculum, we must establish the purpose. AI education is not just about coding; it is about protecting human dignity, agency, and accountability.





AI As an Education Ally

Strategy 1

Adaptive & Inclusive Learning

Strategy 2

Enhancing Teacher Capacity

Strategy 3



SI: AI as an “Educational Ally”

Reflective Approach	Shift in Mindset	Actionable Strategy	Reciprocal Nature
Assign students to write reflective papers on AI usage to connect technology to ethical concerns like plagiarism	Move from fear to viewing AI as a companion that guides tasks and enhances critical thinking	<ul style="list-style-type: none">• Facilitate Critical Discussions: Use readings to frame AI ethics.• Collaborative Learning: Group projects where students share strategies for incorporating AI	Teachers must step into students' shoes to understand how they interact with AI tools

S2: Adaptive & Inclusive Learning

Personalization	Inclusivity	Asset Oriented Adaptivity	Intelligent Tutoring Systems (ITS)
AI enabled learning platforms analyze behavior to customize content delivery.	Moving beyond "teaching to the middle." AI can adapt to the diverse needs of neurodiverse learners and students with disabilities.	Shifting from a deficit model (fixing what is lacking) to building on student strengths and community assets.	Providing step-by-step feedback during problem-solving, similar to human tutors.

S3: Enhancing Teacher Capacity

- Three Loops of Teacher Engagement:
 - **Doing Teaching:** Moment-to-moment decisions in the classroom.
 - **Planning & Reflecting:** Using AI to reduce administrative burden (record keeping, resource finding),.
 - **Designing & Evaluating:** Teachers participating in the selection and evaluation of AI tools.
- **Reducing Burden:** Using AI assistants to handle low-level details allows teachers to focus on student relationships.
- **Professional Development:** Training must combine technical know-how with pedagogical application

From Passive Consumption to Active Co-Creation

Traditional Education	Future Ready Education
Rigid, exam oriented structures	Adaptive, interdisciplinary pathways
Passive consumption of technology	Active co-creation of knowledge
Tool-based literacy (TARA, e-Jaadui Pitara)	Ethical & critical literacy
The Risk: Without this shift, the AI models will become the “revered sources of authority”, causing human knowledge production to atrophy.	

50% of all employees will need
reskilling by 2025 (WEF)



Pedagogy: From theory to practice

Unplugged Activities



Teaching logic and algorithms without screens.
Focus on concepts.

Project-Based Learning



Real-world problem solving.
Ex: Designing a tool for a grandparent.

Ethics Labs



Simulating high-stakes scenarios.
Example: "AI Act Courtroom Debate" — Jury evaluates prohibited AI systems.

Empowering students through active, hands-on learning and ethical consideration.

Mathematics: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Copying to understanding	Don't just assign problems. Assign a "Chat with AI" task. Tell students: "Ask the AI to explain the concept of 'Linear Equations' to you like you are 10 years old. Then, ask it to give you a real-life example involving cricket or shopping."	Students engage in a dialogue. They don't copy the output; they read, synthesize, and rewrite the explanation in their own notebooks in their native language or simple English.
Error Detective	Generate a math solution using an AI tool (like ChatGPT or Gemini) that intentionally contains a common subtle error (e.g., a sign error in algebra or a wrong formula in mensuration). Project this on the board.	Students work in pairs to find the bug in the AI's reasoning. They must solve the problem themselves to prove the AI wrong and "grade" the AI's work.

Mathematics: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Practice Sets	Prompt an AI tool: "Create 5 word problems on 'Profit and Loss' for Class 7. Make Level A simple direct calculation, Level B involving a slight twist, and Level C a challenging HOTS (Higher Order Thinking Skill) problem suitable for competitive exams.	Students choose their challenge level. Those struggling build confidence with Level A, while advanced students stay engaged with Level C. Everyone works on the same topic but at their own pace.
Visualizing the abstract	Use a free tool like GeoGebra (often integrated with AI features now). Enter an equation or a shape property on the smartboard (or share the link). Ask: "What happens to the area of this rectangle if I double the length but keep the perimeter same?"	Students predict the outcome first, then use the tool to manipulate the shape and verify their hypothesis visually.

Science: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Visual Lab Assistant	When teaching a complex process like "Photosynthesis" or "Digestion," ask the AI to generate a creative analogy. Prompt: "Explain how a plant eats sunlight to a student living in Mumbai. Compare it to a solar-powered kitchen making lunch."	Students sketch this analogy in their notebooks based on the AI's description. They translate the text into a visual diagram, reinforcing the mental model of the process.
Hypothesis Generator	Present a scenario: "We are going to drop a feather and a coin from the same height." Ask the class to predict the result. Then, use AI to simulate the variable change. Prompt: "What would happen if we dropped a feather and a coin on the Moon (in a vacuum)? Explain the physics."	Students debate the AI's prediction against their own. They must identify why the result changes (identifying "Air Resistance" as the hidden variable).

Science: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Local Contextualizer	Take a textbook definition of "Force" or "Friction" and ask AI to rewrite it using a local context. Prompt: "Create 3 examples of 'Friction' using situations from an Indian street market or a cricket match."	Students critique the examples. They discuss: "Is the friction greater on a mud pitch or a grass pitch?" This moves them from memorizing definitions to analyzing their environment.
Scientific Myth Buster	Ask AI to generate a "Two Truths and a Lie" regarding a topic like "The Solar System." Prompt: "Give me 3 statements about Mars. Two should be scientifically accurate, one should be a common myth. Don't tell me which is which yet."	Students use their textbooks or quick research to verify the facts and identify the imposter statement. They then have to explain why the myth is false using scientific evidence.

Social Science: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Time Travel Interview	Instead of lecturing about the Mughal Empire or the Freedom Struggle, tell the class: "Today we are going to interview a farmer living during the reign of Akbar." Prompt: "Roleplay as a wheat farmer in Punjab in the year 1580. Answer my students' questions about your taxes, your family life, and what you think of the Emperor. Keep your language simple."	Students act as "journalists." They ask questions to uncover the difference between then and now (e.g., "Do you have schools?", "How do you pay taxes?"). They then write a diary entry from that perspective.
Comparative Geographer	Use AI to create a "Day in the Life" comparison table. Prompt: "Create a comparison table for a 12-year-old boy living in the Thar Desert versus a boy living in the Sundarbans. Compare their food, clothing, house materials, and daily challenges."	Students analyze the table to find the connection between Climate and Lifestyle. They must explain why the houses are different (e.g., "Why does the desert house have thick walls?").

Language: Implementation Strategies

Strategy	Teacher Action	Expected Student Action
Style Shifter	Take a simple, casual sentence (or a student's own sentence) and ask the AI to rewrite it in 3 distinct "voices." Prompt: "Rewrite the sentence 'I want to play cricket but I forgot my bat' in three styles: 1. A formal letter to a coach. 2. An excited WhatsApp message to a friend. 3. A dramatic commentary style."	Students critique the examples. They discuss: "Is the friction greater on a mud pitch or a grass pitch?" This moves them from memorizing definitions to analyzing their environment.
Unfinished Story	Generate an engaging "Story Starter" with a local twist. Prompt: "Write the first paragraph of a mystery story about a school student in Bangalore who finds an old, glowing coin on the Metro. Stop right at the cliffhanger."	Students must read the paragraph (comprehension) and then write the next paragraph. They have to maintain the tone and solve the problem introduced by the AI.

Summary of the strategies

Subject	Strategy	Skill Targeted
Math	The Error Detective	Critical Thinking & Verification
Science	The Visual Lab Assistant	Visualization of Abstract Concepts
Social Science	The Time Travel Interview	Empathy & Historical Context
Language	The Style Shifter	Vocabulary & Register (Formal/Informal)

Ethical Integration: Bias, Privacy and Safety



- ✔ Do No Harm: Assess risks to privacy and well-being.
- ✔ Proportionality: Balance benefits against risks (e.g., environmental costs).
- ✔ Non-Discrimination: Detect and combat algorithmic bias.
- ✔ Safe Use: Protect personal data from commercial surveillance.

Students must learn to assess the intent behind AI design throughout its life cycle.





Q&A

Thank you!