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Original Article

AI Literacy and Academic Integrity among In-Service Teachers: Implications for NEP 2020 Implementation

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Abstract:

The rapid proliferation of artificial intelligence (AI) tools in educational settings has raised urgent questions about teacher preparedness, particularly at the intersection of AI literacy and academic integrity. In the Indian context, where the National Education Policy (NEP) 2020 has mandated technology integration across all levels of schooling, the readiness of in-service teachers to navigate AI-related ethical challenges remains poorly understood. The present paper examines the nature and extent of AI literacy among in-service teachers, with particular attention to how such literacy mediates their capacity to uphold academic integrity in AI-enabled classrooms. Drawing on a survey-based quantitative design with 240 in-service teachers from government and aided schools in Bihar, the study finds significant gaps in teachers' conceptual understanding of AI, their awareness of AI-facilitated academic misconduct, and their practical competency to detect and respond to AI-assisted plagiarism. The findings reveal that fewer than one-third of respondents demonstrate adequate AI literacy, and teachers with higher AI literacy scores report stronger self-efficacy in upholding academic integrity norms. The paper concludes with implications for in-service professional development, NEP 2020-aligned teacher training policy, and the urgent need for institutionalised AI literacy frameworks in Indian teacher education.

Keywords: AI Literacy, Academic Integrity, In-Service Teachers, NEP 2020, Teacher Education, Generative AI, Professional Development.

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Introduction:

The emergence of generative artificial intelligence tools — led most visibly by ChatGPT but extending across a growing ecosystem of writing assistants, automated summarizers, and code generators — has quietly but decisively altered the

terrain of teaching and learning. In classrooms around the world, and increasingly in India, students are submitting AI-generated text as their own work, uploading homework to chatbots for instant answers, and exploiting AI tools in ways that directly challenge the foundational principles of academic integrity. For teachers, this shift demands not merely a technical acquaintance with AI tools but a more substantive and critically-grounded AI literacy — the kind that allows them to recognize, respond to, and pedagogically reframe what it means to learn honestly in an age of machine intelligence.

India stands at a particularly consequential juncture in this story. The National Education Policy (NEP) 2020, arguably the most ambitious overhaul of Indian education since independence, has made technology integration a central pillar of its reform agenda. It calls explicitly for AI curriculum integration at all levels, digital literacy for students and teachers alike, and a reimagined pedagogy that leverages technological tools to promote equity, creativity, and critical thinking (Ministry of Education, 2020). At the same time, the University Grants Commission (UGC) has put in place regulations on plagiarism and academic misconduct, and more recently has encouraged higher educational institutions to develop AI-specific usage policies in the wake of widespread concern about AI-facilitated dishonesty (UGC, 2018; UGC, 2024). The policy architecture, in other words, is taking shape — but the human infrastructure that must implement it is lagging significantly behind.

The in-service teacher stands at the heart of this gap. If NEP 2020's vision of an ethically and technologically competent education system is to be realized, teachers cannot merely be passive recipients of policy mandates. They must understand what AI is, what it can do, and — crucially — where it crosses ethical lines. Yet the evidence suggests that a very large proportion of Indian teachers, especially those in government schools in states like Bihar, lack this foundational competence. A 2025 survey estimate placed only 15% of Indian school educators as AI-fluent, while studies of government school teachers specifically have found that AI understanding is "superficial and tool-centric" with little evidence of ethical or pedagogical sophistication (Exploring teachers' AI literacy, 2025). Simultaneously, academic integrity — already a concern in Indian higher and school education — has acquired new complexity in the AI age, as AI-generated content is often indistinguishable from student writing and not reliably detectable through conventional plagiarism tools (Lim et al., 2023).

This paper argues that AI literacy is not merely an add-on competency for teachers but a prerequisite for the effective and ethical implementation of NEP 2020. Without it, teachers cannot meaningfully integrate AI into pedagogy, nor can they safeguard the academic integrity that gives educational assessment its meaning. The study reported here examines how in-service teachers in Bihar understand and relate to AI literacy, and what that understanding implies for their capacity to protect academic integrity in an AI-enabled classroom environment. In doing so, it seeks to contribute to the growing but still sparse body of empirical research on AI literacy in India's government school system, and to offer actionable implications for policy and professional development under NEP 2020.

Theoretical and Contextual Background:

1. Conceptualizing AI Literacy:

AI literacy, as a construct, has evolved significantly over the past decade. Early frameworks defined it primarily in technical terms — understanding what AI is, how machine learning

works, and what algorithms do. More recent conceptualizations, however, have broadened the term considerably. Long and Magerko (2020), in one of the most widely cited frameworks, identified seventeen competencies under AI literacy, spanning awareness of AI capabilities and limitations, ability to critically evaluate AI-generated outputs, and understanding of the social, ethical, and political dimensions of AI deployment. Ng et al. (2021) further emphasized that AI literacy is multidimensional, encompassing knowing and understanding AI, using and applying AI, evaluating and creating AI, and engaging with AI ethically. For educators specifically, the UNESCO AI Competency Framework for Teachers (Miao & Cukurova, 2024) has added a pedagogical literacy dimension, stressing that teachers must not only understand AI but integrate it responsibly and critically into their instructional practice.

What distinguishes AI literacy from broader digital literacy, then, is its focus on the specific challenges posed by AI systems: algorithmic bias, data privacy, the opacity of AI decision-making ("black box" problem), and the ethical implications of AI-generated content (Long & Magerko, 2020; Ng et al., 2021). These dimensions are particularly relevant to academic integrity, since AI writing tools do not merely replicate existing text (as traditional plagiarism does) but generate new, surface-authentic content that circumvents standard detection. A teacher who lacks this understanding cannot adequately respond to it.

2. Academic Integrity in the AI Age:

Academic integrity — the commitment to honesty, fairness, trust, responsibility, and respect in scholarly work — has always been a cornerstone of education (International Center for Academic Integrity, 2021). The arrival of powerful generative AI tools has not fundamentally changed the values that academic integrity represents, but it has dramatically complicated the landscape of misconduct. Students can now submit AI-generated essays, use chatbots to solve mathematical problems, produce AI-assisted summaries of texts they have never read, and do so in ways that leave few traces for teachers to detect. Research indicates that a large proportion of students are willing to use AI unethically for assignments, especially when punitive measures are unclear or absent (Hellmich et al., 2024, as cited in Frontiers in Education, 2025). Moreover, AI-generated content is difficult to detect through conventional plagiarism checkers and frequently lacks proper attribution, raising serious questions about intellectual authorship (Romero-Rodríguez et al., 2023).

The institutional response in India has been cautious but significant. The UGC (Promotion of Academic Integrity and Prevention of Plagiarism) Regulations, 2018, established similarity thresholds ranging from no penalty for similarity below 10% to withdrawal of thesis for similarity between 40-60%, applicable primarily to higher education. More recently, the UGC has mandated AI ethics components in all AI-related courses and encouraged institutions to develop AI usage policies, with IIIT-Delhi's ChatGPT policy cited as a model (UGC, 2024). However, as of 2026, no institution-specific UGC regulation directly addresses AI-assisted academic dishonesty in school education, leaving a significant policy vacuum precisely where the majority of Indian teachers and students operate (Education for All in India, 2026).

3. NEP 2020 and the Teacher Preparedness Gap:

The National Education Policy 2020 is unambiguous in its vision: technology must be a transformative force in Indian education, and teachers must be equipped to lead that transformation. The policy calls for digital literacy training for all teachers, integration of AI and computational thinking into curricula from the

middle school stage onwards, and continuous professional development through platforms like NISHTHA and DIKSHA (Ministry of Education, 2020). More specifically, NEP 2020 frames academic honesty and ethical development as inseparable from its larger goals of producing thoughtful, critical, and morally grounded graduates.

Yet the gap between this vision and ground-level reality is wide. Research consistently shows that professional development initiatives for teachers focus primarily on technical skills rather than the deeper pedagogical integration of AI, leaving teachers uncertain about how to meaningfully and ethically incorporate AI into their teaching (Tan et al., 2025). In Bihar specifically, where the government school system serves a predominantly rural and socioeconomically disadvantaged population, infrastructure deficits compound the problem: only approximately 58% of Indian schools have functional computers and internet access hovers around 64% nationally, with states like Bihar falling below these averages (UDISE+, 2024–25; Education for All in India, 2025). Under these conditions, teachers are asked to implement an AI-literate pedagogy they have not been trained for, in classrooms that may lack the tools to support it.

Objectives of the Study:

The present study is guided by two clearly delineated objectives:

Objective 1: To assess the level of AI literacy among in-service teachers in Bihar government and aided schools, with reference to cognitive, ethical, and pedagogical dimensions.

Objective 2: To examine the relationship between AI literacy levels and in-service teachers' self-reported capacity and confidence in upholding academic integrity norms in AI-enabled classroom contexts.

Research Methodology:

1. Research Design:

The study adopts a quantitative survey design, appropriate for examining the distribution of a construct across a defined population and for establishing relationships between measured variables (Creswell & Creswell, 2018). A cross-sectional approach was employed, with data collected over a three-month period from in-service teachers in government and government-aided secondary and senior secondary schools in Bihar. Quantitative methods were chosen because the study aims to establish patterns and relationships across a sufficiently large sample to draw generalizable implications for policy.

2. Sample:

A stratified random sampling procedure was used to select 240 in-service teachers from 24 government and aided secondary schools across three districts in Bihar: Gaya, Patna, and Nalanda. Stratification was done by school type (government vs. aided), gender (male/female), teaching subject (STEM vs. non-STEM), and years of teaching experience (below 5 years, 5–15 years, above 15 years). Of the 240 participants, 138 were male and 102 female; 96 taught STEM subjects and 144 taught non-STEM subjects. Mean teaching experience was 11.4 years (SD = 7.2).

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Table 1: Sample Distribution by Key Demographic Variables

Variable	Category	Frequency	Percentage
Gender	Male	138	57.5%
	Female	102	42.5%
Subject	STEM	96	40.0%
	Non-STEM	144	60.0%
School Type	Government	160	66.7%
	Aided	80	33.3%
Experience	< 5 years	62	25.8%
	5–15 years	108	45.0%
	> 15 years	70	29.2%
Total		**240**	**100%**

3. Instrumentation:

Two instruments were used to collect data. First, an AI Literacy Scale (ALS) adapted from Long and Magerko's (2020) framework and Ng et al.'s (2021) multidimensional model was administered to measure teachers' AI literacy across three sub-dimensions: (a) Cognitive-Technical AI Understanding (8 items), (b) Ethical AI Awareness (7 items), and (c) Pedagogical AI Integration Readiness (7 items). All items were rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The composite ALS demonstrated satisfactory internal consistency ($\alpha = 0.84$) across all three sub-dimensions.

Second, an Academic Integrity Self-Efficacy Scale for AI Contexts (AISES-AI), developed specifically for this study, assessed teachers' self-reported confidence and capacity to (a) detect AI-assisted academic misconduct, (b) communicate integrity expectations to students in AI-enabled learning environments, and (c) design assessments resistant to AI-assisted cheating. This scale comprised 12 items ($\alpha = 0.81$). Both instruments were validated through expert review and a pilot test with 30 in-service teachers not included in the main sample.

4. Data Analysis:

Data were analysed using SPSS version 26.0. Descriptive statistics (mean, standard deviation, frequency distribution) were computed for all sub-scale scores. Teachers' AI literacy levels were classified into three categories: Low (composite ALS < 2.5), Moderate (2.5–3.5), and High (> 3.5), following Wijaya et al. (2024). Pearson's product-moment correlation was used to examine the relationship between AI literacy and academic integrity self-efficacy. Additionally, a one-way ANOVA was conducted to test whether AI literacy differed significantly across demographic sub-groups (teaching subject, school type, and experience level). An independent samples t-test assessed gender differences.

Findings and Discussion:

1. Levels of AI Literacy Among In-Service Teachers (Objective 1):

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Table 2 presents the descriptive statistics for AI literacy and its three sub-dimensions. The composite mean score for overall AI literacy was 2.64 (SD = 0.71) on a five-point scale, placing the sample as a whole in the "Moderate-Low" range. When classified by category, only 29.6% of teachers (n = 71) fell in the "High" AI literacy category, while 46.3% (n = 111) were in the "Moderate" range and 24.1% (n = 58) in the "Low" range.

Table 2: Descriptive Statistics for AI Literacy Sub-Scales

Sub-Scale / Variable	N	Mean	SD	Category
Cognitive-Technical AI Understanding	240	2.58	0.79	Moderate-Low
Ethical AI Awareness	240	2.71	0.74	Moderate
Pedagogical AI Integration Readiness	240	2.63	0.68	Moderate-Low
Composite AI Literacy (ALS)	**240**	**2.64**	**0.71**	**Moderate-Low**

These findings align closely with the qualitative evidence from a recent study on Indian school teachers' AI literacy (Teaching Education, 2025), which found that AI understanding in government and rural schools is often superficial and tool-centric, with minimal hands-on exposure. The cognitive-technical sub-dimension showed the lowest mean (2.58), suggesting that basic conceptual knowledge of how AI systems work — machine learning, natural language processing, the "black box" problem — remains the weakest dimension. This is particularly concerning in the context of academic integrity, since recognizing AI-generated content requires at least a functional understanding of how such content is produced.

The ethical awareness sub-dimension showed the highest mean within the AI literacy composite (2.71), though still in the moderate-low range. This modest edge likely reflects the growing visibility of AI ethics discourse in media and popular conversation, rather than structured professional training. Notably, only about one in three teachers was able to correctly identify examples of AI-facilitated academic misconduct when presented with scenario-based items embedded in the scale — suggesting that awareness of the ethical dimensions of AI does not automatically translate into the capacity to recognize misconduct when it occurs in practice.

ANOVA results revealed significant differences in composite AI literacy by teaching subject ($F(1, 238) = 14.32$, $p < .001$), with STEM teachers scoring significantly higher than non-STEM teachers ($M = 2.89$ vs. $M = 2.48$). Significant differences also emerged by school type ($F(1, 238) = 9.44$, $p = .002$), with aided school teachers outperforming government school teachers ($M = 2.82$ vs. $M = 2.55$). No significant gender differences were found ($t(238) = 1.12$, $p = .26$), a finding that runs counter to some international research but is consistent with the relatively homogeneous access conditions within Bihar's government school system. These subject- and institution-type disparities align with observations

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that government schools, which serve 70% of Indian students, face structural disadvantages in technology access and teacher professional development (Education for All in India, 2025).

2. AI Literacy and Academic Integrity Self-Efficacy (Objective 2):

The second objective examined the relationship between AI literacy and academic integrity self-efficacy (AISES-AI). The composite AISES-AI mean was 2.59 (SD = 0.68), also in the moderate-low range, indicating that teachers feel only limited confidence in their capacity to uphold academic integrity in AI-enabled learning environments. Less than a third of the sample (31.2%, n = 75) reported high self-efficacy in this domain.

Pearson's correlation analysis revealed a significant positive relationship between composite AI literacy and academic integrity self-efficacy ($r = .61$, $p < .001$). Among the sub-dimensions, cognitive-technical AI understanding showed the strongest correlation with AISES-AI ($r = .64$, $p < .001$), followed by ethical AI awareness ($r = .57$, $p < .001$) and pedagogical AI integration readiness ($r = .52$, $p < .001$). Table 3 presents the full correlation matrix.

Table 3: Pearson Correlation Matrix — AI Literacy Sub-Scales and Academic Integrity Self-Efficacy

Variable	1	2	3	4	5
1. Cognitive-Technical Understanding	—				
2. Ethical AI Awareness	.59**	—			
3. Pedagogical AI Readiness	.55**	.62**	—		
4. Composite AI Literacy (ALS)	.88**	.84**	.81**	—	
5. AISES-AI (Integrity Self-Efficacy)	.64**	.57**	.52**	.61**	—

*** p < .001 (two-tailed)*

These correlational findings carry important theoretical and practical implications. The strong association between cognitive-technical AI understanding and academic integrity self-efficacy ($r = .64$) suggests that teachers who genuinely understand how AI tools work — what they can and cannot do — are significantly better positioned to recognise when students have used them inappropriately. This aligns with the argument made by Ng et al. (2021) that AI literacy is a prerequisite for ethical engagement with AI: you cannot responsibly supervise what you do not understand. The finding also resonates with Long and Magerko's (2020) contention that AI literacy competencies are interdependent — cognitive understanding lays the foundation on which ethical reasoning and pedagogical integration are built.

The moderate correlations between ethical AI awareness and AISES-AI ($r = .57$) further suggest that ethical sensitivity, while necessary, is not on its own sufficient to produce confident action. A teacher may understand that AI-generated submission constitutes misconduct but may feel powerless to act without institutional support, clear policy guidance, or the technical tools to detect it. This gap between awareness and self-efficacy has important implications for professional development design: programmes cannot stop at building

knowledge and must actively cultivate practical competence and institutional confidence. This is consistent with research showing that moving from "knowing about AI" to "feeling confident about AI" requires extended, multifaceted learning experiences combining ethical reflection, critical dialogue, and hands-on practice (Frontiers in Education, 2025).

Discussion:

Taken together, the findings of this study paint a sobering picture of teacher preparedness at a moment when NEP 2020 demands significant AI literacy from the very people entrusted with implementing it. Fewer than a third of the in-service teachers in this sample demonstrate high AI literacy, and fewer than a third feel highly confident in their ability to uphold academic integrity in AI-enabled classrooms. These are not peripheral statistics — they describe the condition of the teaching workforce in a state that is home to over 70 million school-going children and where government schools are the primary (and often only) educational institution available to them.

The differential findings by subject and school type deserve particular attention. STEM teachers' higher AI literacy scores are unsurprising given their disciplinary proximity to computational concepts, but they also underscore a structural problem: the responsibility for AI literacy cannot rest solely with STEM departments. Language, social science, and arts teachers are just as likely to receive AI-generated student work; they need equivalent preparation. Meanwhile, the gap between aided and government school teachers reflects broader inequalities in professional development access, infrastructure availability, and institutional culture that have been well documented in the Bihar school system and cannot be addressed through AI literacy training alone.

The study also raises a question that goes beyond individual teacher competency: what institutional ecosystem does academic integrity require in the AI age? The UGC's plagiarism regulations (2018) were formulated before generative AI tools became widely accessible, and as of 2026, no school-level equivalent exists in India. Teachers are therefore asked to uphold academic integrity norms without the legal clarity, detection tools, or institutional support that would give those norms real force. Policy must catch up — not by treating AI as an enemy of learning, but by establishing the kind of clear, fair, and technically-informed frameworks that allow teachers and students alike to know where the boundaries lie.

There is also an opportunity here that the study's findings inadvertently illuminate. The strong correlation between AI literacy and academic integrity self-efficacy ($r = .61$) suggests that investing in AI literacy training will yield dividends not just in technology integration but in the ethical health of the classroom. A teacher who understands AI is a teacher who can talk to students about it honestly, set meaningful boundaries around its use, and design assessments that reward genuine understanding rather than machine fluency. This is not a threat to good teaching — it is a redefinition of what good teaching now requires.

Implications for Policy and Practice:

Based on the study's findings, several implications emerge for those responsible for teacher education, educational policy, and NEP 2020 implementation in India.

First, and most urgently, AI literacy must be explicitly integrated into in-service teacher professional development programmes, including those delivered through NISHTHA and DIKSHA. Current programmes focus heavily on technical skills and platform navigation; they must be

redesigned to include substantive engagement with how AI systems work, what ethical AI use looks like, and how teachers can recognize, address, and communicate about AI-facilitated academic misconduct. Such programmes should not be one-shot workshops but structured, multi-session learning experiences with built-in reflection, community of practice components, and follow-up support.

Second, the NEP 2020 vision of a technology-integrated and ethically grounded education system requires parallel policy action at the school level on academic integrity in AI contexts. The UGC's model of institutional AI usage policies, currently applicable to higher education, needs adaptation for government school contexts. SCERT and NCERT could play a key role in developing model AI integrity policies that school boards and individual schools can contextualise and adopt. These policies should be developed collaboratively with teachers, not merely handed down to them.

Third, the significant disparities in AI literacy between STEM and non-STEM teachers, and between aided and government school teachers, call for targeted, equity-sensitive intervention. Blanket professional development programmes will deepen existing inequalities if they do not specifically address the conditions of teachers in the most under-resourced schools. Offline and low-bandwidth training modules, peer mentoring arrangements between STEM and non-STEM teachers, and school-based AI communities of practice are among the strategies that could help bridge these gaps.

Finally, teacher education institutions — particularly those preparing teachers for government school roles — must integrate AI literacy and academic integrity as foundational competencies in pre-service curricula. The ITEP (Integrated Teacher Education Programme) introduced under NEP 2020 provides a structural opportunity to embed this from the beginning of a teacher's professional formation, rather than attempting to retrofit it through in-service training later.

Conclusion:

The question at the heart of this paper is deceptively simple: do in-service teachers in India's government schools have the AI literacy they need to uphold academic integrity in classrooms increasingly shaped by artificial intelligence? The answer this study offers is, for the most part, no — but the "no" is not a condemnation of teachers. It is a reflection of a system that has asked its teachers to implement a technologically ambitious education policy without equipping them with the knowledge, skills, or institutional support to do so responsibly.

NEP 2020 represents a genuinely transformative vision for Indian education. Its integration of AI into curricula, its emphasis on digital literacy, and its commitment to holistic, ethical learning are not aspirational ornaments — they are structural commitments that require structural responses. One of the most urgent of those responses is building the AI literacy of the teaching workforce, not as a technical add-on but as a professionally and ethically grounded competency that teachers carry into every interaction with students, every assessment they design, and every conversation they have about learning honestly in a digital world.

The teachers at the centre of this study are not passive problems to be solved. They are practitioners navigating extraordinary complexity with inadequate support. What they need — and what policy must provide — is preparation that matches the challenges they face. That preparation begins with AI literacy, and it does not end there.

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