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INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881(Print); IMPACT FACTOR :10.16(2026); IC VALUE:5.16; ISI VALUE:2.286
PEER REVIEWED AND REFEREED INTERNATIONAL JOURNAL
(Fulfilled Suggests Parameters of UGC by IJMER)
Volume:15, Issue:1(5), January 2026
Scopus Review ID: A2B96D3ACF3FEA2A
Article Received: Reviewed: Accepted
Publisher: Sucharitha Publication, India
Online Copy of Article Publication Available: www.ijmer.in

AUTOMATION-DRIVEN ARTIFICIAL INTELLIGENCE AND HUMAN-CENTRED ARTIFICIAL INTELLIGENCE IN EDUCATION: IMPLICATIONS FOR TEACHING AND PEDAGOGY

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Abstract:

The use of Artificial Intelligence (AI) in Education has heightened the discussion regarding automation's role, teacher agency and ethical responsibility. Two primary paradigms have emerged from these discussions; Automation-driven AI and Human-centred AI. Automated AI is focused on maximising efficiency, scalability and replacing workers or tasks with algorithms making decisions for them, whereas Human-centred AI focuses primarily on augmenting human intelligence, transparency and ethical governance. This study will use a conceptual and systematic literature review methodology to synthesise both peer-reviewed research and policy documents from 2015 to 2024. Through this examination, the two Paradigms will be compared based on how they relate to pedagogy, teacher's roles, learner's agency, assessment and ethical dimensions [8][14]. The results indicate that while automation-driven AI improves administrative efficiency and promotes instructional standardisation throughout the education system, it has the potential to de-skill teachers and dehumanise the teaching profession [9][18]. Conversely, human-centric AI enables reflective teaching along with the development of inclusive teaching methodologies and professional independence [11]. Furthermore, this study advocates for a joint human-AI approach that protects pedagogically based values while integrating new technological advancements, in accordance with both India's National Education Policy 2020 as well as UNESCO guidelines [10][16]. This article provides both conceptual contributions to the discourse surrounding AI in education and also provides policy-oriented insights regarding continuing on-going teacher development transformations through pedagogical innovation.

Keywords: Artificial Intelligence in Education, Automation-Driven AI, Human-Centred AI, Teaching and Pedagogy, Teacher Education

1. Introduction:

The introduction of Artificial Intelligence (AI) into educational systems is a growing trend that is changing how we may design curricula, conduct assessments, process learning analytics, as well as govern institutions [1][6]. As institutions grapple with massive-scale problems including learners with different backgrounds, constraints on learning resource availability, and tracking learner performance, many institutions are beginning to utilize innovations in AI [14].Historically, AI was being utilized within education in ways that were automated; AI-driven systems are designed to take the place of people (or at least decrease their role) in performing mundane repetitive tasks such as grading assignments, recording student attendance, and conducting predictive analysis on student performance [5]. While these systems can enhance operational efficiency, there are several criticisms about these systems including biases inherent within the algorithms used by them, a lack of transparency regarding how algorithms operate, a diminished sense of autonomy felt by teachers, and a tendency to reduce the educational experience to a series of quantifiable performance indicators [8][9].

The emergence of HCAI has prompted both officials and academics to call for an increased emphasis on developing systems that are designed with human users in mind through ethical design, transparency, collaboration, and oversight [3][10]. Human-centred approaches are consistent with learner-centred pedagogies and the professional ethics of Teaching. Although there is increasing interest in these approaches, there are few studies to provide a systematic comparison of HCAI and automation-driven Artificial Intelligence in terms of how they are used within educational policy, particularly in India, where the NEP 2020 is currently in effect. By exploring the impact of HCAI and automation on the pedagogical practice and the professional identity of teachers, this investigation will help fill this void.

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2. Methodology:

The literature review in this study is a conceptual and systematic review method used to analyse theoretical and policy-oriented research in education [14] based on work done before October 2023.

2.1 Data Sources

The Sources used are Scopus, Web of Science, ERIC, Google Scholar and official publications from UNESCO, OEDC and the Government of India.

2.2 Selection Criteria

Included studies met the following criteria:

- Published between 2015–2024
- Focused on AI in education, automation, ethical AI, or human-centred AI
- Peer-reviewed or policy-based
- Relevant to pedagogy, assessment, teacher roles, or governance

2.3 Analytical Framework

The literature was coded thematically under:

1. Conceptual foundations
2. Pedagogical implications
3. Teacher professional identity
4. Ethical and policy considerations

This enabled structured comparison between automation-driven AI and human-centred AI.

3. Conceptual Framework

3.1 Automation-Driven Artificial Intelligence

The philosophy of software development and automation-driven artificial intelligence (AI) is based on an instrumentalist philosophy that views software and AI tools as ways to reduce costs through automation and to increase the effectiveness of processes through automation. This philosophy is dominant in the majority of automation-driven systems.[5] The use of automation-driven AI in education includes the use of:• Automatic grading• Learning management analytics• Adaptive testing• Institute monitoring systems [6][14].Automation-driven AI is often viewed as a black box, making it difficult for people who use these systems to understand how they function and what they provide,[7] leading to the lack of an adequate understanding of automation-driven AI.[8][16].

3.2 Human-Centred Artificial Intelligence

HCAI provides an ethical framework based on augmenting human capabilities, ethical accountability, use of transparent methods, and designing for inclusiveness [3]. In pedagogy, HCAI supports:

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- Teacher-guided learning analytics
- Explainable tutoring systems
- Inclusive and adaptive learning tools
- Formative assessment support [11][12]

Teachers remain central decision-makers, while AI provides cognitive support rather than authoritative control.

4. Review of Related Literature

Zawacki-Richter et al. [14] suggest that the main way in which AI is used in the higher education sector will be for administrative and assessment automation, whereas technological transformation is not one of the major areas supported. Additionally, Selwyn warns that AI is likely to result in the increased technocratic control of education [8].

As stated by Williamson, the application of data-driven governance involves a significant change to the nature of educational accountabilities [9]. In contrast, Schneiderman proposes an application of HCAI to create trustworthy and socially responsible systems [3].

Fluori et al. [4] propose that the use of ethical guidelines for AI governance should include issues related to autonomy (independence), fairness (equity) and explicability (clarity). However, the extent to which these guidelines are currently being used within educational settings is minimal.

5. Comparative Analysis: Teaching and Pedagogy:

Dimension	Automation-Driven AI	Human-Centred AI
Teaching Role	System supervisor	Pedagogical decision-maker
Pedagogical Orientation	Standardized	Personalized and adaptive
Instructional Design	Algorithm-driven	Teacher-guided
Assessment	Automated, summative	Formative, collaborative
Ethical Engagement	Minimal	Embedded
Professional Autonomy	Reduced	Strengthened
Inclusivity	Indirect	Explicit focus

6. Implications for Teaching and Pedagogy

6.1 Implications of Automation-Driven AI for Teaching and Pedagogy

- Reduces teacher workload by automating routine instructional tasks such as grading, attendance, and content sequencing [5][6].
- Repositions teachers as **system supervisors** rather than primary pedagogical decision-makers [8][16].
- Encourages **standardized instructional models** based on algorithmic recommendations and predictive analytics [9][14].
- Limits teachers' ability to adapt instruction to socio-cultural and emotional learning needs of students [8].
- Risks promoting **teacher dependency on AI systems**, leading to potential deskilling over time [15][16].
- Narrows pedagogical focus to measurable learning outcomes, marginalizing creativity and inquiry-based learning [16].
- Increases surveillance-oriented classroom management, raising concerns about student autonomy and trust [9][15].
- May reinforce existing educational inequalities through biased training data and opaque decision rules [4][15].

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6.2 Implications of Human-Centred AI for Teaching and Pedagogy

- Positions AI as a **supportive instructional tool**, enhancing rather than replacing teacher judgment [3].
- Strengthens **reflective teaching practices** through interpretable learning analytics and formative feedback systems [11][12].
- Enables **differentiated and personalized instruction** aligned with diverse learner needs and abilities [12][13].
- Supports inclusive pedagogy by facilitating accommodations for learners with disabilities and varied learning styles [10].
- Encourages collaborative intelligence, combining human empathy and creativity with AI-based data insights [3][11].
- Preserves teacher autonomy in curriculum design, assessment interpretation, and classroom decision-making [13].
- Promotes ethical awareness and critical digital literacy among teachers and students [10].
- Aligns with learner-cantered pedagogical principles emphasized in NEP 2020 and UNESCO AI frameworks [10][18].

6.3 Pedagogical Synthesis

- Automation-driven AI primarily optimizes **instructional efficiency**, while human-centred AI prioritizes **pedagogical quality and ethical responsibility** [3][8].
- Sustainable teaching practices require **human–AI collaboration**, not algorithmic substitution of teacher roles [10][13][18].
- Teacher education programs must therefore emphasize **AI literacy, ethical reasoning, and pedagogical design skills** rather than mere technical operation of AI tools [13][18].

7. Ethical and Policy Considerations

Concerns about surveillance, privacy, and algorithmic bias amplified by automation-driven systems have become more prevalent. There is an increasing emphasis on human-centred AI in accordance with the U.N.E.S.C.O.'s ethical guidelines of promoting transparency, accountability & human oversight.

The National Education Policy (N.E.P.) of India 2020 states that Technology should enable teachers rather than replace them and therefore supports the empowerment of teachers & provision of inclusive education. This is closer aligned to the principles of human-centred A.I.

8. Future Directions

Pedagogical Models in Future Must Utilize a Human–AI Collaborative Framework That Pairs AI Analytics with Teacher Judgement and Empathy [3, 13]. Therefore, Teacher Education Programs Should Include Components of AI Literacy, Ethics, and Pedagogical Design Skills.

Finally, Governments and Policy Makers Need to Create Policies Guiding the Implementation of AI—Including Providing Students, Educators, Stakeholders, and Governments with Transparency and Accountability to Ensure Educational Equity [10, 18]. New Research Studies Following Students Post Graduation and into the Professional Job Market Will Be Required to Assess Learning Outcomes and Professional Identity Development as a Result of Teacher Preparation Programs.

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9. Conclusion

Automation-driven AI enhances the efficiency of teaching; however, it has the potential to convert the teaching process into simply being an algorithm and reduces the teacher's professional autonomy. Human-centred AI supports the pedagogical integrity, ethical responsibility and professional autonomy of teachers. In order to create sustainable transformation in education, more emphasis should be placed on the use of human-centred AI and the use of Automation-driven AI will be supportive rather than directive.

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