ISSN: 2393-8048
International Advance Journal of Engineering, Science and Management (IAJESM)
Multidisciplinary, Multilingual, Indexed, Double Blind, Open Access, Peer-Reviewed, Refereed-International Journal.
SJIF Impact Factor = 8.35, January-June 2026, Published on 28th February 2026

Artificial Intelligence–Driven Quality Assurance in Indian Higher Education: A Human-Centred Framework for Strengthening NAAC Accreditation

Shalu Rani, Department of Computer Science, Dayanand College, Hisar, Haryana, India shalunarang@dnc.ac.in
Dr. Neeru Bala, Department of Mathematics, Dayanand College, Hisar, Haryana, India neerubala@dnc.ac.in

Abstract

The accreditation system of Higher education governance has gone under a great transition in this digital World. The revolutionary shift of NAAC accreditation to the digitally verifiable metric-based data driven approach improves transparency and comparability but they also introduce substantial administrative and data management complexity. The present paper is an effort to create a Human- Centred AI Quality Assurance Model(HCAI-QAM), which will allow the integration of artificial Intelligence into the accreditation procedures without reducing the academic sovereignty. The framework is based on five interconnected layers: data integrity, predictive analytics, expalinability, participatory error and continuous quality improvement, which are stuck in the sociotechnical systems theory and human-in loop principles. The research links AI interventions to the seven accreditation criteria of NAAC directly and suggests measures to be taken to deploy AI responsibly. The results suggest that through the implementation of AI, accreditation can be transformed into an ongoing institutional education rather than periodic compliance in case it is integrated into the governance-based systems.

Keywords: AI, NAAC, accreditation, human-centred AI, higher education governance, quality assurance

1. Introduction

Accreditation is like a quality check for colleges and universities. It helps make sure that institutions are doing their job properly. It builds trust, ensures transparency and makes institutions accountable for their performance. Earlier Accreditation was mainly dependent on peer review i.e experts vising the institutions used to observe things and write reports based on their perception but this approach was highly dependent on personal opinions so sometimes it could be biased. Though now the system has changed, system is dependent on facts and data. Measurable data evaluation is there which makes the whole process clear and fair.

In India, NAAC has updated its system and uses both qualitative and quantitative data for evaluation. Data Validation and Verification (DVV) was introduced by NAAC to check the authenticity of data other than this one important step to standardize the evaluation system for all institutions taken by NAAC is multi-indicator Institutional Quality Audit(MIIQA) which evaluates the digital proofs. However, still many colleges face issues related while handling large sum of data, huge documentation and managing a lot of paper work, due to this reason many colleges start their preparation when accreditation is near instead of updating records regularly. Which defies the main purpose of accreditation which is continuous effort for improving the quality instead accreditation becomes a last minute activity.

This is where AI can really help. AI can make the whole process smoother and more efficient. Instead of checking quality only once in a while, AI systems can monitor performance continuously throughout the year. They can automatically organize data, verify documents and keep track of whether the institution is meeting the accreditation standards. This not only reduces the stress of last minute preparation but also helps college maintain consistent quality all the time. But AI for accreditation needs to be used very carefully to make the system transparent and fair. Also the privacy and integrityshould be taken care of while sharing the data.AI should be used as supportive system only, we should not let it control the system.

As a whole it can be said that the latest AI enabled system can bring a major revolution in Higher education governance and accreditation as it can monitor the quality or performance continuously and can help to check whether the institutions meet the accreditation standard in

a continue manner. In response to this AI transition, here we present a Human Centred AI Quality Assurance Model(HCAI- QAM) in Indian context.

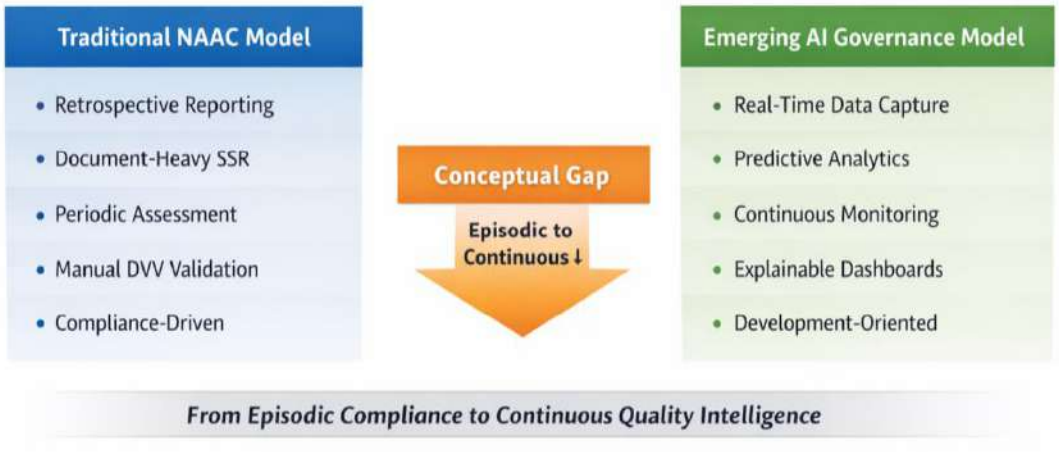

Figure 1 From Episodic Compliance to Continuous Quality Intelligence:

2. Literature Review

2.1 Accreditation System Development and Digital Quality Systems

The accreditation system in higher education has changed a lot in today's digital world. The shift of NAAC accreditation towards a system based on digital records makes it easier to compare across the institutions (Harvey and Williams, 2020). Digital transformation has increased this change because it has made possible centralized documentation platforms and evaluation based on analytics.

The new accreditation structure of NAAC focuses on the performance outcomes, research productivity, the use of infrastructure, and transparency in governance (NAAC, 2023). These reforms are consistent with the overall modernization agenda as desired in the National Education Policy 2020 (Ministry of Education, 2020). Nevertheless, studies show that several institutions do not have integrated data architectures that can be used in real-time monitoring (Kumar & Gupta, 2023).

2.2 Artificial Intelligence within Higher Education Governance

The field of AI use in higher education has grown beyond the instructional technologies to institutional analytics systems (Zawacki-Richter et al., 2020). Student retention forecasting on predictive models is highly prevalent across the student body (Siemens and Baker, 2012), whereas administrative AI tools are being used to optimize budgeting and enrollment planning (Holmes et al., 2020).

Emerging scholarship (2024– 2025) is focused on AI-based accreditation tools. Zhang et al. (2024) prove that natural language processing systems lower the discrepancies of the report in compliance documents. The article by Martin and Reeves (2025) demonstrates that smart dashboards increase accreditation preparedness, yet it is important to avoid over-automation.

These conclusions indicate that AI can be used to enhance institutional governance when implemented in transparent and accountable systems.

2.3 Ethical and Governance Activities

Evaluation systems managed by AI are called into question in terms of algorithmic bias, transparency, and the obscurity of the decision. Reliable AI principles support the idea of human control, fairness, explainability, and robustness (European Commission, 2022; OECD, 2021). Ethical protection is needed in the context of accreditation where the results influence the financial sources as well as the reputation of the institution.

Although the literature has been growing, the conceptual work of direct mapping of AI applications to the criteria of NAAC is very minimal. This disruption creates a necessity to have a context-sensitive and governance-integrated framework.

Research Objectives

This study seeks to:

- Analyze organizational constraints on NAAC accreditation practices.
- Create an all-inclusive AI- based quality assurance system.
- Integrate AI operations to the seven accreditation criteria by NAAC.
- Recommend ethical governance protection.

In spite of the fact that the existing research notes the increasing importance of artificial intelligence in the sphere of higher education management and learning analysis, the literature is still biased in terms of technological, governance, and accreditation lenses. Table 1 provides a systematic synthesis of these studies that charts major themes, contributions, and gaps in the research on AI-enabled accreditation systems.

NAAC Criterion	Traditional Evaluation Focus	AI-Enabled Data Source	Analytical Layer	Governance Output	Strategic Value
Curricular Aspects	Syllabus revision reports, BOS minutes	LMS logs, curriculum repository metadata	NLP-based curriculum gap analysis	Curriculum alignment dashboard	Real-time curriculum relevance monitoring
Teaching–Learning & Evaluation	Result analysis, pass percentage	LMS interaction data, assessment analytics	Predictive learning analytics	At-risk student identification system	Early intervention & adaptive learning
Research, Innovations & Extension	Publication counts, project reports	Scopus/Google Scholar APIs, research databases	Bibliometric & network analysis	Research productivity heatmaps	Evidence-based research strategy
Infrastructure & Learning Resources	Physical inspection reports	IoT-based usage logs, digital library analytics	Utilization optimization models	Resource efficiency dashboard	Data-driven infrastructure planning
Student Support & Progression	Placement records, alumni feedback	ERP, alumni portals, placement data	Career trajectory modeling	Employability index visualization	Outcome-oriented institutional planning
Governance, Leadership & Management	IQAC minutes, policy documents	ERP governance logs, workflow systems	Process mining & compliance analytics	Governance transparency index	Continuous institutional accountability
Institutional Values & Best Practices	Narrative documentation	Event logs, sustainability metrics	Pattern recognition & impact modeling	Sustainability & inclusion scorecard	Measurable value-based governance

Table 1 Mapping of Accreditation Criteria to AI-Enabled Governance Architecture

The current literature, as it is summarized in Table 1, is rather focused on technological opportunities of AI-based analytics and online surveillance. Nonetheless, little has been put on ensuring the design of human-centered AI architectures integrate transparency, institutional

governance, and regulatory accountability in accreditation ecosystems. This is the gap that prompts the creation of Human-Centered AI Quality Assurance Model that will be proposed in the present paper.

3. Theoretical Foundations

The Human-Centered AI Quality Assurance Model (HCAI-QAM) is theoretically grounded on the crossroads between the socio-technical systems theory, algorithmic governance, and institutional quality legitimacy theory. The framework does not think of artificial intelligence as an instrumental technology but, instead, AI is a governance infrastructure embedded in the higher education quality ecosystems.

As a socio-technical systems theory brings out, technological systems gain their significance and efficacy in interrelation with human actors, organizational norms, and institutional culture. As procedural compliance goes, accreditation is an institutionally constructed legitimacy mechanism that indicates credibility of institutions. The implementation of AI in accreditation, therefore, cannot be seen only as one of the efficiency-enhancing supplements, rather It must be integrated into existing human decision architectures while preserving professional sovereignty and contextual understanding.

Continuing on the theoretical lenses presented above, the change process of making accreditation a formal periodical compliance exercise to an ongoing AI-enhanced quality ecosystem can be modelled in terms of an integrated lifecycle. The lifecycle suggested brings out the way in which artificial intelligence could drive various processes on institutional quality assurance, such as data gathering, assessment, predictive analysis, and enhancement. This AI-enabled accreditation lifecycle has a conceptual structure as shown in Figure 2.

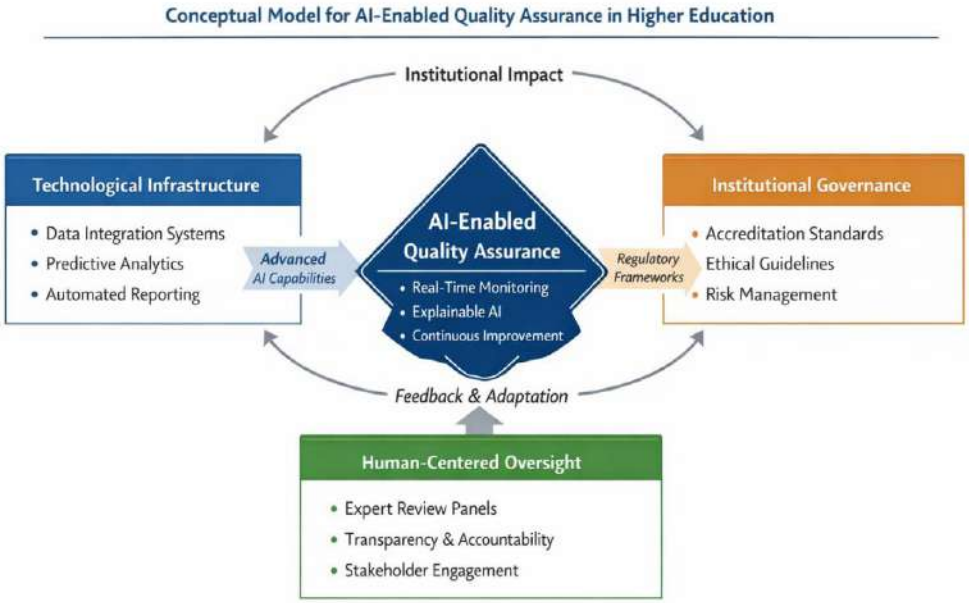

Figure 2 Conceptual Model for AI-Enabled Quality Assurance in Higher Education

4. Conceptual Development Approach

The paper uses a conceptual development method to develop the Human-Centered AI Quality Assurance Model (HCAI-QAM). Instead of using the collection of empirical data, the framework is elicited with the help of an integrative synthesis of three main areas of knowledge, i.e.: the systems of quality assurance in higher education, new applications of artificial intelligence in educational governance, and theoretical views on socio-technical systems, as well as algorithmic governance. The current literature on accreditation practices and AI institutional analytics was analyzed to find structural issues with the current quality assurance systems, especially concerning the upcoming accreditation structure of the Indian National Assessment and Accreditation Council (NAAC).

Conceptual development was done in three phases. To begin with, a policy trajectory analysis has looked at the change in the architecture of accreditation in India, especially the shift in the digital, evidence-based, and AI-assisted evaluation systems. This discussion pointed at institutional conflicts between customary documentation-intensive models of compliance and new data-driven paradigms of governance.

Second, the analysis of the interdisciplinary research on AI-driven governance, educational analytics, and modernization of accreditation took place, and the critical synthesis was conducted. Instead of just describing the existing literature, the synthesis was aimed at deriving the central design principles applicable to trust maintenance, algorithmic impartiality, institutional responsibility, and feasibility in a higher education system.

Third, the construction of abductive models was utilised to transform theoretical knowledge and the identified problems in institutions into a systematic conceptual construction. Systemic constraints and normative principles were mapped through iterative thought to layered structures of architecture that embodied institutional data system, AI analytics mechanisms, governance oversight structures, and decision-support interfaces.

5. Operational Architecture of Proposed Model (HCAI-QAM)

Based on the theoretical basis and conceptual development, this paper will introduce the Human-Centered AI Quality Assurance Model (HCAI-QAM) as a systematic model of implementing AI in a higher education accreditation system. The structure is in response of the growing need of ongoing and evidence-based quality surveillance without sacrificing the critical place of the human judgment, institutional governance, and regulatory accountability.

Contrary to the traditional accreditation measures that majorly depend on the documentation of past and the timely evaluation processes, the HCAI-QAM envisages accreditation as a responsive and data-driven quality ecosphere. In this ecosystem, institutional data streams, AI-based analytics systems, and human control mechanisms work together on a continuous basis to aid evidence-based decision making. The model thus re-defines accreditation as a compliance oriented exercise to a continuous institutional quality intelligence system.

Figure 3 depicts the architecture design of the proposed framework that shows the layered organization of the Human-Centered AI Quality Assurance Model. The framework has an arrangement of several interdependent layers that together facilitate data integration, intelligent analytics, governance management, and strategic decision support as indicated in the figure.

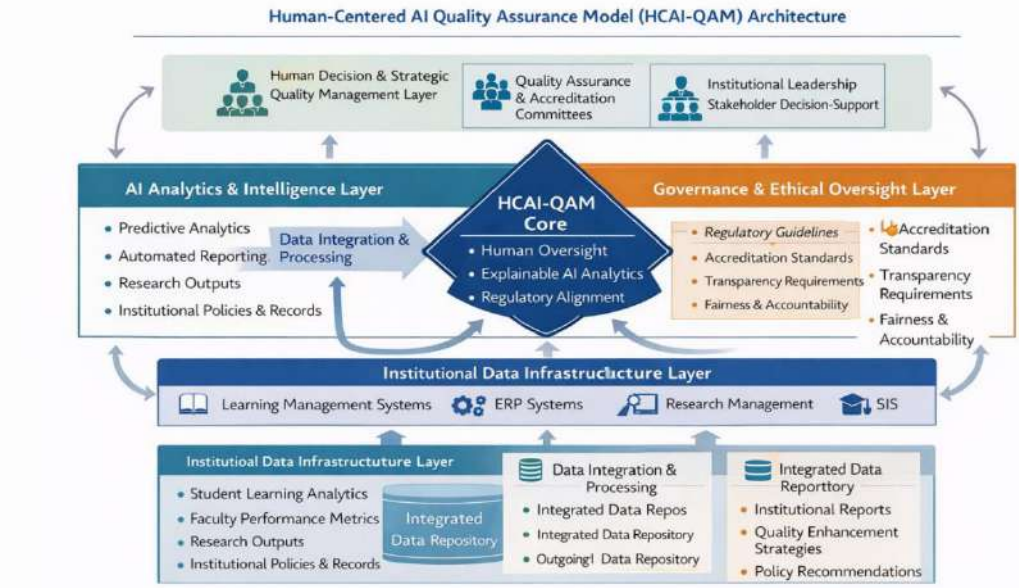

Figure 3. Human-Centered AI-Enabled Quality Assurance Model (HCAI-QAM) for Accreditation and Institutional Evaluation.

5.1 HCAI-QAM Framework Layered Architecture.

The framework is based on the Institutional Data Infrastructure Layer, which combines different types of data that are produced by different academic, administrative and institutional management systems. These information sources comprise student learning data, faculty performance data, research data, curriculum data, and institutional governance data. Such information is usually spread over disconnected systems in most institutions of higher learning like Learning Management Systems (LMS), Enterprise Resource Planning (ERP) systems, examination databases, and research management portals. HCAI-QAM framework suggests that an integrated institutional data ecosystem should be developed to consolidate such heterogeneous flows of data into a single repository that can be analyzed using AI.

5.2 HCAI-QAM Framework Design Principles.

To start with, the framework focuses on human-centered integration of AI. Instead of substituting human assessors, AI technologies have been placed as decision-support tools that can help increase analytical power without compromising human interpretation and institutional independence. The concept echoes larger issues in the field of educational technology research about the ethical implementation of the system of algorithms in the learning and governance processes.

Second, the model gives importance to the transparency and explainability of algorithmic processes. The reputational and regulatory consequences of accreditation decisions are enormous to the institutions; hence, AI systems to be applied in this case should produce readable outputs that can be interpreted and assessed by the stakeholders. The fact that the governance and audit is implemented in the framework is the guarantee that the outputs of the algorithms are not only responsible, but can also be questioned.

Third, the framework is supposed to ensure regulatory consistency with the accreditation standards, especially the ones made by the national quality assurance agencies. The model also ensures that technological innovation does not ruin the current regulatory systems; therefore, it aligns AI analytics capabilities with the known accreditation indicators.

Fourth, the framework is capable of constant quality monitoring as opposed to infrequent assessment. Conventional accreditation models tend to follow periodic cycles with the reinforcement of documentation practices that are responsive. The HCAI-QAM architecture allows constant monitoring of the institution by conducting real-time data analysis and will make the institution conscious of quality trend.

Lastly, the framework nurtures institution scalability and flexibility. The difference between higher education institutions is huge regarding technical infrastructure, data governance ability, and organizational maturity. The HCAI-QAM model of the layered architecture enables institutions to embrace AI-based quality assurance stepwise, starting with the integration of data and gradually moving into more complex analytics and governance tools.

5.3 Framework Implications for AI-Enabled Accreditation Systems

Having combined these design principles in a layer-based governance model, the HCAI-QAM model outlines a conceptual map of the transformation of accreditation into a strategic institutional intelligence system. Instead of being an exercise of compliance with regulations, accreditation turns out to be an evidence-based practice that improves the ongoing enhancement, sound policy making, and learning within the institution.

Moreover, the proposed architecture is in line with international trends of risk-based accreditation and digital regulatory ecosystems. Adoption should however be a context-specific process. The problem of transitional strain may arise in institutions that lack digital infrastructure. The absence of fair capacity-building solutions is likely to cause further institutional stratification due to technological acceleration.

In this way, the key point that can be identified in this analysis is that AI-based accreditation should be understood as a means of governance expansion as opposed to governance

replacement. The revolutionary possibility of AI is not automation per se, but rather the possibility of reflective data-informed institutional self-regulation.

6. Conclusion

The incorporation of artificial intelligence into India's accreditation ecosystem represents a tactical change from periodic, documentation- heavy assessment toward constant, evidence-driven quality assurance. The Human-Centred AI Quality Assurance Model (HCAI-QAM) proposed in this study establishes how AI can reinforce institutional decision-making when embedded within transparent governance structures and guided by human oversight. By aligning AI analytics with NAAC's principal criteria and highlighting data integrity, explainability and ethical safeguards, the model provides a possible pathway for institutions to improve quality monitoring without conceding autonomy or trust.

7. References

1. Alam, A. (2021). Possibilities and challenges of artificial intelligence in education. *International Journal of Emerging Technologies in Learning, 16*(21), 4–18. https://doi.org/10.3991/ijet.v16i21.26247
2. Bearman, M., Dawson, P., Boud, D., Hall, M., Bennett, S., Molloy, E., & Joughin, G. (2020). Reimagining university assessment in a digital world. *Assessment & Evaluation in Higher Education, 45*(6), 939–952. https://doi.org/10.1080/02602938.2019.1697405
3. Bengio, Y. (2024). AI governance and accountability in education systems. *Nature Machine Intelligence, 6*(2), 134–140. https://doi.org/10.1038/s42256-024-00789-1
4. Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to the COVID-19 pandemic. *Asian Journal of Distance Education, 15*(1), i–vi.
5. Brynjolfsson, E., & McAfee, A. (2017). *Machine, platform, crowd: Harnessing our digital future*. W. W. Norton.
6. Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial intelligence trends in education. *Procedia Computer Science, 136*, 16–24. https://doi.org/10.1016/j.procs.2018.08.233
7. Crawford, J., Butler-Henderson, K., Rudolph, J., & Glowatz, M. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching, 3*(1), 1–20.
8. Dwivedi, Y. K., Hughes, D. L., Ismagilova, E., et al. (2023). So what if ChatGPT wrote it? Multidisciplinary perspectives on generative AI in research and practice. *International Journal of Information Management, 71*, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642
9. European Commission. (2023). *Ethical guidelines on the use of artificial intelligence and data in teaching and learning for educators*. Publications Office of the European Union.
10. Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI in society. *Harvard Data Science Review, 1*(1). https://doi.org/10.1162/99608f92.8cd550d1
11. Gamage, K. A. A., Dehideniya, S. C. P., & Ekanayake, S. Y. (2020). The role of personal values in learning approaches and student achievement. *Education Sciences, 10*(5), 123. https://doi.org/10.3390/educsci10050123
12. Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
13. Holmes, W., Porayska-Pomsta, K., & Holstein, K. (2022). Ethics of AI in education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education, 32*, 504–526. https://doi.org/10.1007/s40593-021-00239-1
14. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson Education.
15. National Assessment and Accreditation Council. (2020). *Manual for self-study report (SSR) for affiliated/constituent colleges*. NAAC.

16. National Assessment and Accreditation Council. (2023). *Revised accreditation framework (RAF) 2023 guidelines and key indicators*. NAAC.
17. Nguyen, A., Gardner, L., & Sheridan, D. (2023). Data-driven quality assurance in higher education. *Higher Education Research & Development, 42*(4), 782–796. https://doi.org/10.1080/07294360.2022.2048634
18. OECD. (2021). *OECD digital education outlook 2021: Pushing the frontiers with AI, blockchain and robots*. OECD Publishing. https://doi.org/10.1787/589b283f-en
19. Ouyang, F., & Jiao, P. (2024). AI-supported accreditation analytics in higher education institutions. *Computers & Education: Artificial Intelligence, 5*, 100156. https://doi.org/10.1016/j.caeai.2024.100156
20. Popenici, S., & Kerr, S. (2017). Exploring the impact of AI on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning, 12*(1), 22. https://doi.org/10.1186/s41039-017-0062-8
21. Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Polity Press.
22. Seldon, A., & Abidoye, O. (2018). The fourth education revolution: Will artificial intelligence liberate or infantilise humanity? *The University of Buckingham Press*.
23. Sharma, R., & Mishra, P. (2024). Intelligent dashboards for institutional accreditation: Evidence from Indian higher education. *Journal of Educational Technology Systems, 52*(2), 215–234. https://doi.org/10.1177/00472395241234567
24. UNESCO. (2021). *AI and education: Guidance for policy-makers*. UNESCO Publishing.
25. UNESCO. (2023). *Generative AI and the future of education*. UNESCO Publishing.
26. Zawacki-Richter, O., Marín, V., Bond, M., & Gouverneur, F. (2019). Systematic review of research on AI applications in higher education. *International Journal of Educational Technology in Higher Education, 16*(1), 39. https://doi.org/10.1186/s41239-019-0171-0
27. Zhu, M., Sari, A. R., & Lee, M. M. (2024). Governance challenges of AI-enabled quality assurance in universities. *Educational Technology Research and Development, 72*(1), 85–104. https://doi.org/10.1007/s11423-023-10245-8