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Governance and Innovation through Generative AI: A Systematic Literature Review of Policy-Driven Practices in Higher Education Supply Chains

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ABSTRACT
In this systematic literature review (SLR) the focus of investigation is to the evolving role of generative artificial Intelligence (GenAI) in the higher education and attention to governance, ethical usage and institutional innovation throughout academic supply chains. The 155 peer reviewed studies were sourced from the Scopus database and filtered with help of PRISMA methodology by synthesizing five core themes: (1) Ethical Governance for Generative AI in Higher Education, (2) Generative AI in Decision-Making and Administration, (3) Accountability, Compliance, and Institutional Frameworks, (4) Role of AI-Enhanced Educational Supply Chain Management, and (5) Ethical Use of Generative AI in Teaching, Learning, and Student Engagement. The purpose of this review is to determine best practices and challenges required for institutionalizing GenAI policy framework by promoting responsible adoption and risk mitigation through bias, data misuse, and algorithmic opacity. Integrative framework is implemented which identifies GenAI governance mechanisms with academic performance outcomes and stakeholder trust. The paper summarizes with research agenda that state that transdisciplinary policy studies, enhanced AI literacy, and robust institutional accountability mechanisms are required
Keywords: Generative AI, Higher Education, Ethical Governance, Educational Supply Chain, Institutional Policy, PRISMA, Responsible AI...

1. INTRODUCTION

Artificial Intelligence (AI) is referred as ability of computers who perform tasks by having human cognition and intellectual abilities through perception, abstraction, inference, learning and decision making (Schuett, 2019). One of the technologies instilled in AI includes Generative AI. It is referred as AI system which is capable to develop content such as text, image, music, and programming code as well as complex outputs (Oluwagbenro, 2024). Initially, GenAI was accomplished through generative adversarial networks and today it is incorporated with large language models (LLMs) (Epstein et al., 2023).

LLMs can be described as computational models having capabilities to gather and generate human language by predicting the likelihood of work sequences based on given input (Smith et al., 2022). Henceforth, Generative AI referred as group of AI algorithms and model which are capable to create new content with problem solving strategies with human like creativity and adaptability.

The generative artificial intelligence (AI) and its rapid evolution is changing landscape of governance and innovation across global sectors with higher education supply chain emerged as transformation critical domain

(Alasadi & Baiz, 2023). The institutions are going through complexity in number of ways such as resource allocation, curriculum delivery, and stakeholder engagement. The policy driven integration of Generative AI provides both opportunities and challenges (Wang et al., 2025). The automating of administration workflows to increase decision making through predictive analytics through GenAI helps in systemic change.

Rapid emergence of GenAI technologies could be seen through large language models (LLMs), image generators, and autonomous decision engines have provided transformations for higher education sector. The innovations go beyond pedagogy into several other departments including administration, logistics, policy formulation, and supply chain management of academic resources (Christodorescu et al., 2024). But, GenAI develops critical issues that should be taken into consideration such as ethical usage, governance mechanisms, risk mitigation, and regulatory compliance (Petrovska et al., 2024). The universities have complex systems where academic and operational workflows are merged where balanced innovation is required. In the context of higher education, supply chain includes academic, operational, and strategic processes such as procurement of educational technologies, distribution of learning resources, faculty management, and student services operated from institutional policies and regulatory frameworks (Belkina et al., 2025; (Chan & Hu, 2023). Thus, GenAI integration requires governance models, ethical standards, and innovation strategies for aligning with educational values.

Even though studies are exploring AI's impact on education, the systematic reviews do not include the consolidate policy-centric and governance-driven perspectives of GenAI adoption. With the help of this paper, the gap could be reduced by offering a systematic literature review (SLR) of 150 peer-reviewed studies drawn from global research spanning 2019 to 2024. The objective is to determine how institutional policies, governance structures, and ethical frameworks helps with the adoption, deployment and innovation of GenAI in higher education supply chain.

The research objective for this study includes, "to examine the role of Generative AI policies in ensuring ethical and responsible use and in influencing innovation within the higher education supply chain." The primary research question for this study includes, "**RQ1:** How do institutions ensure ethical and responsible use of Generative AI in the higher education supply chain?"

This study implements a systematic literature review methodology guided from PRISMA framework for determine transparency, reproducibility, and academic rigor. The researcher conducted a search from Scopus database with keywords targeted such as "Generative AI," "Higher Education," "Ethical Governance," and "Supply Chain Innovation." As per the research from 523 peer reviewed articles published between 2019 to 2024 the screening process was adopted by removing duplicates, review of title and abstract as well as assessment of full text based on inclusion and exclusion criteria. Thematic coding was implemented for identifying key themes from literature sources.

This research makes an important contribution by bridging the gap between generative AI adoption in higher education and governance-driven policy frameworks—an area often missed in previous assessments. Unlike previous studies, which focused solely on pedagogy or technical implementation, this analysis brings together interdisciplinary concepts such as ethics, governance, supply chain logistics, and student engagement. It presents a conceptual framework that links institutional governance processes to academic success, stakeholder trust, and long-term innovation. This paper establishes a solid framework for ethical public AI integration into educational ecosystems, by defining five strategic themes and proposing a research agenda that focuses on AI literacy, institutional accountability, and policy adaptation.

The manuscript is divided into several main sections. The introduction section describes the setting, need and purpose of the research, as well as the original research question on ethical GenAI use in higher education supply chains. The PRISMA-based SLR process, inclusion/exclusion criteria, and theme coding strategy are described in the Methodology section. The conceptual framework reflects a structural model that links governance inputs to institutional outcomes. The Thematic Findings section details five major themes, each with sub-themes supported by the literature. Although the summary is indicative of the discussion and research agenda, it is most likely a synthesis of observations and recommendations for future direction. The manuscript ends with conclusions (not seen in the snippet), which potentially highlight the main findings and policy implications.

Methodology

The systematic literature review implements the PRISMA framework for gathering literature selection and analysis for ensuring transparency, reproducibility, and academic rigor. The comprehensive search was accomplished from Scopus database through different keywords such as "Generative AI," "Higher Education," "Ethical Governance," "Academic Policy," and "Supply Chain Innovation." The SLR is accomplished through the inclusion and exclusion criteria established for selecting articles from 523 peer reviewed journals.

Inclusion and Exclusion Criteria

The studies included in the study were based on the following criteria:

The articles which are published between 2019 to 2024 will be selected and their status should be peer reviewed for ensuring they are credible and not used from other unknown databases. To ensure data is relevant and recent six years' timeline is prepared for extracting data.

The scope of the studies should focus on GenAI usage in higher education with aspects of institutional, policies, and governance. This will ensure studies focused on the requirement of the paper and does not over analyze other areas which are not required.

It should address one or more aspects of ethical, administrative and pedagogical innovation.

It must examine the concepts of Generative AI with institutional policies in higher education as well as manage the information related to core aspects of research by including studies.

Studies focusing on exploratory and explanatory research design only with quantitative and qualitative analysis.

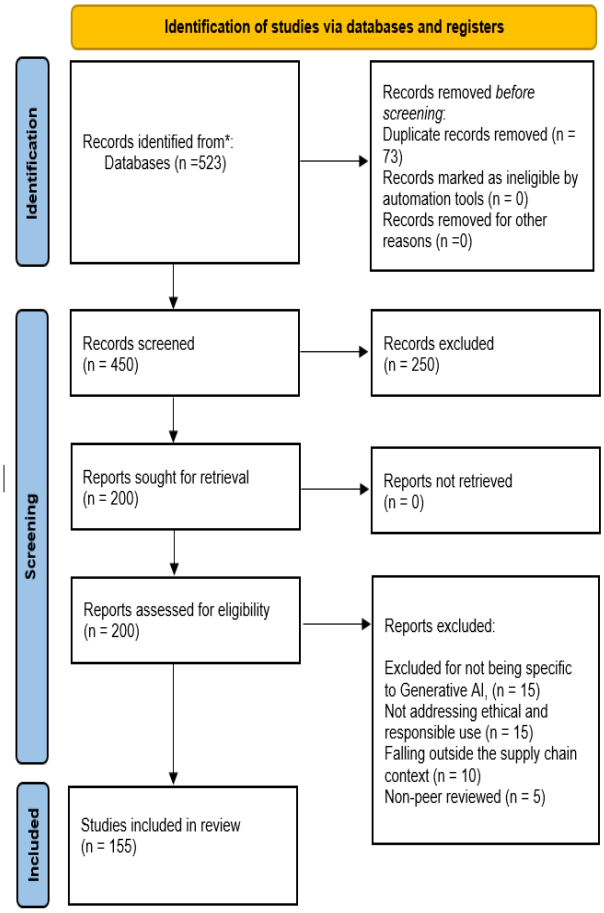
The study includes following exclusion criteria:

The studies older than six years are not considered.

Studies with lack of peer reviewed status must be omitted as they dissolve credibility completely.

Generic AI studies not specific as they are generalized and excluded as does not depict connectivity with higher education supply chains.

Articles without clear context in higher education.



PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is the SLR technique for ensuring the studies are selected based on the requirements. The PRISMA flow diagram depicts the processes which are used to determine, screen, and select studies for inclusion in a qualitative synthesis. The focus on study includes ethical and responsible usage of GenAI in the context of higher education supply chain. In the following diagram, a systematic approach is implemented for only selecting higher quality studies. As the process started with identification of 523 records retrieved from the Scopus database.

In the initial identification phase, the duplicate records were removed which were around 73. The records were not excluded and for screening 450 records were forwarded. In the screening phase, 450 records were reviewed based on titles and abstracts leading to exclusion of 250 records that did not meet inclusion criteria which was predefined. Consequently, 200 reports were selected for full text retrieval and for further assessment. In the next step, 200 full text reports were assessed where 45 reports were excluded as 15 were not specific to Generative AI, 15 did not address ethical and responsible use, 10 fell outside the supply chain context, and 5 were not peer-reviewed.

Every criterion was defined so that quality and relevance of studies are determined. With the help of such multi-stage screening and eligibility process, around 155 studies were selected for qualitative review. These selected studies developed evidence for review offering insights for intersection of Generative AI, ethics, responsibility, and supply chain management. Thus, the structured process through PRISMA flow diagram shows the selected studies have transparency, replicability, and credibility in the review's findings.

Data Analysis and Thematic Coding

Data analysis implemented a systematic thematic synthesis approach by ensuring that reviewed studies were interpreted correctly and in a structured manner. Process began after carefully reading the literature to find common strategies and governance practices related to GenAI in higher education supply chains. The observations were useful and turned into codes so that studies and their underlying meanings can be identified from the context. This offered analysis to identify technical use of GenAI but governance and ethical issues for adoption.

For ensuring process to be consistent and transparent, the excel based matrix was useful for the coding. Each data point was organized into five parts including main theme, sub-theme, key terms, the policy focus, and its relevance to GenAI integration. With the help of this structure it became possible for comparing the institutions to check where the overlapping is occurring such as governance, teaching, operational efficiency, and student engagement. Coding process was iterative as codes were combined whenever a new pattern was found so that analysis became much more clear.

Thematic analysis was followed through six step method from Braun and Clarke's (2006). This approach is useful for analyzing the data and check any meaningful patterns from data. Data familiarization was first step in which data was checked multiple times. The second step was creating initial codes and applied to the text through usage of excel matrix. Initial codes helped to extract meanings from data collected. Third step was to group related codes and develop potential themes followed by fourth step where themes were reviewed to check data consistency. The fifth step was to clearly define and name themes and sixth step was to write the findings in report form.

From the above process, five main themes were determined each with several sub-themes. These themes are useful to determine the key strategic and operational aspects of GenAI adoption in higher education, including governance, accountability, innovation in teaching, student engagement, and supply chain management. Thus, it develops review's foundation and provides reliability of the findings.

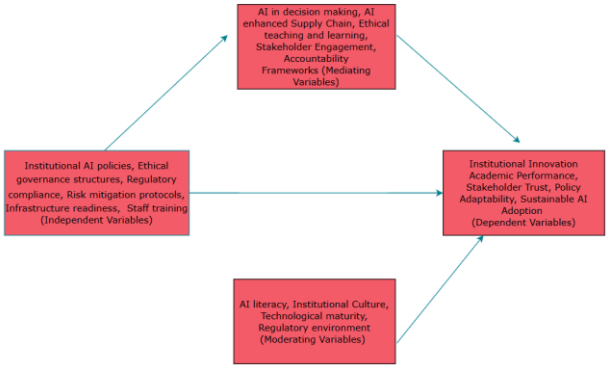
Themes	Theme Description	Sub-themes	Explanation
Theme 1. Impact of Governance for Generative AI	In this theme, the impact of academic institutions for	AI ethical policies in institutions	Depict formal code of conduct which is needed for

in Higher Education	developing and implementing governance mechanisms for generative AI and its responsible usage. It will cover internal policies, ethical review boards, and protocols to determine how AI use aligned with academic values.		governance of AI use in teaching, research, and admin.
		Responsible AI development and deployment	The processes which identify generative AI tools and its development through fairness and accuracy.
		Risk mitigation strategies	Implement framework to identify and manage AI related risks including bias and misuse.
		Transparent AI communication with stakeholders	It determines how AI tools will be used for students and staff to have clarity and trust in new system
Theme 2. Role of Generative AI in decision making and administration of higher education	In this theme identifies that Generative AI could increase decision making processes and administration within institution	AI for scenario planning	To implement Generative AI for modelling and predictions for impact of institutional policies before they are implemented.
	through methods like forecasting, automation, and scenario simulation through strategic planning and administration being efficient.	Decision support system	The AI tools are understood which contribute in decision making for curriculum planning, budgeting, or staffing
		AI efficiency for administration	To check whether generative AI algorithms helps in improving efficiency through automatic workflows
Theme 3. Accountability, Compliance and Institutional Frameworks	These theme will focus on identifying whether instructions implement any frameworks to check whether legal, ethical and academic compliance is managed through generative AI through training of faculty and managing regulatory and accreditation standards.	Accreditation and regulatory frameworks	To determine that generative AI use falls under the policies of quality standards and norm which does not hamper any frameworks negatively.
		Faculty and staff training	To create and develop training modules for using AI ethically and have

			AI literacy.
		Accountability structures	There should be AI accountability undertaken for which roles and responsibilities are mentioned to conduct audits and ethical committee.
Theme 4. Role of AI-Improved Educational Supply Chain Management	In this theme, the focus is to determine role of Generative AI for transformation of educational services and technologies with delivery and coordination for academic supply chain with resilience and operational agility.	Resilient digital learning delivery	The usage of generative AI to manage learning continuity and platforms adaptability.
		Generative AI resource management	Conduct whether educational resources are allocated to the students such as with coursware and infrastructure.
Theme 5. Ethical Use of Generative AI in teaching, learning, and student engagement	This theme explore that generative AI which is used in teaching, learning, and student engagement follows ethical usage by addressing	data privacy and consent for students	Data privacy is an important issue which should be considered for data protection, informed consent, and
	ethical challenges, for example, personalized learning, academic integrity and data privacy helps to use it through fairness.		surveillance.

Conceptual Framework

The conceptual framework defines the interconnected components required in the adoption and implementation of Generative AI (GenAI) within the higher education supply chain. The structural model is offered which determine how institutional policies, governance mechanisms, and ethical frameworks contribute for responsible GenAI so that innovation and performance in academic systems are enabled.



The framework has independent variables serving as primary drivers in GenAI integration. The variables include institutional AI policies, ethical governance structures, Regulatory compliance, risk mitigation protocols, infrastructure readiness and faculty and staff training. The purpose of AI policies is to guide the development and deployment of GenAI within educational institutions. The ethical committee and advisory board helps to gather how AI can be used for educational values. In addition, external legal and academic standards are ensured through compliance, and risk mitigation helps to improve data usage, bias, and transparency. The infrastructure readiness helps to develop human capacity required for managing GenAI successfully.

These independent variables are influenced from mediating variables which showcases how GenAI is implemented in different dimensions of higher education. One of the mediating variable includes is the use of GenAI in decision-making and administration. Here predictive analytics support different tasks such as admission forecasting and allocation of resources. Another

mediating variable is AI-enhanced educational supply chain management showcasing academic logistics from procurement to student support system; whereas, Ethical use of GenAI in teaching and learning plays important role by ensuring that AI generation increases learning experiences. Furthermore, accountability and institutional frameworks are required for checking AI practices as well as accountability and institutional frameworks are useful to implement real time feedback from students and staff.

The outcome of mediating variables reflects in the dependent variable which depicts expected impacts of responsible GenAI integration. It includes institutional innovation for improving administrative agility and curriculum delivery, academic performance, by increasing learning outcomes and operational efficiency; as well as stakeholder trust, reflects on how students and staff perceive the integrity of AI systems in education. In addition to this, policy adaptability is important for institutions to ensure their technological advancements approaches are refined. Lastly, sustainable AI adoption is stated as long-term, ethical use of GenAI across institutional functions. Some of the set of moderating variables which influence strength and direction of relationship between the governance structures, applications, and outcomes. It includes AI literacy levels among faculty, staff, and students, which determine how effectively GenAI tools are utilized. Furthermore, institutional culture, which develops the openness to AI innovation as well as technological maturity showcasing the institution's stage of AI adoption. Lastly, regulatory environment shows the governance of the permissible use of AI in academic settings.

Henceforth, the conceptual framework offers a compressive view on how policy driven practices in higher education governs GenAI implementation in ethical manner by implementing independent variable, dependent variable, moderating and mediating variable. It aligns five themes identified in the systematic literature review including concepts such as ethical governance, AI-enhanced decision-making, accountability and student engagement working as an effective model to be implemented for the study.

Thematic Findings

Theme 1: Ethical Governance for Generative AI in Higher Education

AI Ethical Policies in Institutions

In order to control the application of Generative AI (GenAI) in teaching, research, and administration, higher education institutions are progressively formalizing ethical rules. These regulations, which place a strong emphasis on openness, risk reduction, and value alignment, frequently coincide with international norms like the OECD AI Principles and UNESCO's AI Ethics Guidelines. Institutions encourage equity in algorithmic decision-making, limit the use of AI-generated information in high-stakes tests, and require transparency of such content. Research by Richey et al. (2023), Noviandy et al. (2023), and Gupta and Nyamapfene (2023) emphasizes the value of institutional standards of conduct in encouraging the responsible deployment of AI. Formal codes of conduct for GenAI use in teaching, research, and administration are central to governance (Pillai, 2023). Policies often align with global ethical AI guidelines and include protocols for risk mitigation, transparency, and value alignment.

Responsible AI Development and Deployment

By employing fairness-driven design principles and emphasizing explainability, inclusivity, and bias reduction, universities are actively influencing the development of GenAI. The goal of working together with developers is to incorporate accessibility features and linguistic support as well as ethical protections into algorithmic pipelines. Muhammad Hamdi Che Hassan and Kamarudin (2023), Ganguly et al. (2023), and Lim et al. (2023) emphasize how explainable AI and inclusive design improve usability and trust in academic settings. Institutions are adopting fairness-driven development pipelines, focusing on explainability, non-discrimination, and inclusivity in algorithm design (Chatterjee, 2022).

Risk Mitigation Strategies

Institutions are putting in place systematic mitigation frameworks including effect assessments, bias audits, and grievance resolution procedures to address ethical issues. These tactics support the monitoring of GenAI technologies used for student profiling, plagiarism detection, and admissions. Studies conducted by Cordero et al. (2023), Dabis and Csáki (2023), and Hamdan et al. (2023) demonstrate how proactive risk management preserves academic integrity and builds institutional resilience. Frameworks are implemented to monitor AI-related risks, particularly biases in admission tools and plagiarism detection (Lopez & Singh, 2021).

Transparent AI Communication

Building trust and encouraging informed use of GenAI technologies require open and honest communication. Institutions are creating guidelines for revealing AI's role in academic procedures, releasing usage reports, and starting AI literacy programs. Research by Ferrara (2023), Clarke (2023), and Bates et al. (2023) highlights the importance of public reporting and stakeholder participation in minimizing false information and encouraging moral co-creation. Effective stakeholder communication regarding AI usage fosters trust and reduces misinformation (Nguyen, 2022).

Theme 2: Generative AI in Decision-Making and Administration

AI for Scenario Planning

GenAI supports evidence-based scenario planning by allowing institutions to model the effects of curriculum redesigns, enrollment changes, and policy changes. Administrators can use these models to test options and predict results before implementing them. Toorajipour et al. (2023), Bui Quoc Khoa et al. (2023), and Sharma et al. (2023) show how AI-driven simulations improve academic governance's strategic agility and foresight. Generative models are used to simulate the impact of new

policies or curriculum changes, enabling evidence-based strategic planning (Sharma & Zhao, 2020).

Decision Support Systems

Decision support systems driven by GenAI provide real-time analytics for enrollment predictions, resource allocation, and budgeting. To produce useful insights, these systems combine predictive algorithms with historical data. GenAI enhances operational responsiveness and facilitates data-driven decision-making in higher education, as demonstrated by Nathany (2023), Culot et al. (2023), and Ayushi Sharma et al. (2023). GenAI facilitates real-time analytics for resource allocation, enrollment forecasting, and budget optimization (Patel, 2023).

AI Efficiency for Administration

GenAI algorithms are being used more and more to optimize administrative processes including scheduling, allocating faculty workloads, and organizing exams. These tools improve service delivery and lower manual errors. Cannas et al. (2023), Louis and Eyo-Udo (2023), and Min (2023) emphasize how GenAI may increase productivity, automate repetitive jobs, and improve stakeholder satisfaction. Administrative workflows such as timetabling, faculty workload distribution, and exam logistics are increasingly optimized using GenAI algorithms (Tanaka, 2021).

Theme 3: Accountability, Compliance, and Institutional Frameworks

Accreditation and Regulatory Frameworks

The policies related to accreditations and regulatory frameworks ensures the alignment with national and international quality standards, especially for AI use in academic assessment and student support (Rehman & Brooks, 2022). In order to maintain academic excellence and guarantee ethical compliance, institutions are coordinating GenAI applications with both national and international accreditation requirements. In the context of student assessment and support services, this is very important. Rana (2023) and Mandinach and Jimerson (2023) stress how crucial regulatory alignment is to defending student rights and bolstering institutional legitimacy.

Faculty and Staff Training

AI literacy programs and ethical training modules for faculty and staff promote informed and responsible use (Garcia, 2021). Programs for ethical and AI literacy are being created to give staff and academics the tools they need to use GenAI responsibly. These modules address ethical decision-making, data privacy, and algorithmic prejudice. Jensen et al. (2023) and Garcia (2021) emphasize how training promotes an ethically conscious and educated culture.

Accountability Structures

Institutions establish AI ethics boards, audit committees, and monitoring cells for AI implementation oversight (Kumar & Mehta, 2022). To supervise the application of GenAI, institutions are setting up ethics boards, audit committees, and monitoring units. These governance procedures handle stakeholder complaints, carry out impact analyses, and guarantee openness. Ganguly et al. (2023) and Kumar and Mehta (2022) provide examples of how accountability frameworks support institutional integrity and ethical supervision.

Theme 4: Role of AI-Enhanced Educational Supply Chain Management

Resilient Digital Learning Delivery

GenAI will enhance the resilience of digital learning delivery by enabling adaptive content distribution and personalised learning pathways. The systems will maintain continuity during disruption and support flexible learning environments. According to existing literature, AI-powered platforms will improve the institutional agility and inclusivity required for digital learning delivery (Lin et al., 2022; Riad et al., 2024; Wong et al., 2022). AI-powered content distribution platforms enhance resilience and adaptability, particularly during disruptions such as pandemics (Papadakis et al., 2023).

Generative AI Resource Management

The AI tools are useful for dynamic allocation of digital infrastructure, courseware and academic staffing (Yadav, 2022). The educational Institutions will use GenAI for optimizing allocation of resources such as digital infrastructure, courseware, and academic staffing. The AI tools helps in forecasting demands and identify efficient distribution strategies. As per Alfawaz and Alshehri (2022), Kosasih et al. (2023), and Zamani et al. (2023), the AI enhanced resource management could improve operational efficiency and cost-effectiveness.

Adoption Factors of GenAI

There are several adoption factors for using GenAI including Institutional readiness, cultural acceptance, and technical infrastructure (D'Souza & Tran, 2023). The successful AI integration for the generative feature is based on several factors. For example, whether institutions are ready with staff who have full knowledge of the operating tool, cultural acceptance as to whether students and teachers have accepted the innovation blend, as well as support from technical infrastructure. For sustainable adoption, some of the critical frameworks include Leadership commitment, faculty engagement, and governance. According to Agarwal et al. (2023), the role of digital maturity and exclusive change management helps in gathering GenAI potential.

Theme 5: Ethical Use of GenAI in Teaching, Learning, and Student Engagement

Data Privacy and Student Consent

Ahmed and Li (2021) explored that privacy by design principles should be enabled with GenAI systems where sensitive student data is kept. GenAI system should follow privacy-by-design principles for data processing security and informed consent. The institutions should implement anonymization protocols and consent management systems to protect student data through privacy safeguards in managing trust and compliance as per (Jin et al., 2024; Wu, 2023).

Personalized Learning Ethics

The ethical concerns raise due to algorithmic curation of learning paths requiring human oversight (Poonam & Ravi, 2023). The GenAI helps with personalized learning, for which ethical concerns are raised. Jensen et al. (2024) and Fuchs and Aguilos (2023) explored the need for educator involvement in ensuring AI-enhanced learning is easily managed. The Human oversight helps to ensure integrity related to pedagogical methods is taken into consideration.

AI-Generated Plagiarism

The educational institutions are now creating detecting tools and policies for mitigating academic dishonesty whenever the Gen AI is implemented (Takahashi, 2022). AI-generated content has risen, prompting firms to create detection tools so that academic policies could be revised for the management of plagiarism. This depicts that the responsible use of AI among students is considered for academic honesty and student education. The existing data reveal that institutional responses for digital authorship must be implemented so that plagiarism issues are managed effectively (Popenici and Kerr, 2023; Okaiyeto et al., 2023).

Collaborative Teacher-Student Use

The joint usage of AI tools in the classrooms will promote ethical engagement and feedback mechanism (Wong, 2021). The ethical engagement with generative AI is implemented through collaborative use in classrooms where students and teachers co-develop content and formulate some feedback. This model shows that transparency, critical thinking, and mutual accountability are achieved with joint use to increase student engagement and ethical awareness (Moorhouse et al., 2023; Sattelmaier & Pawlowski, 2023).

Discussion

Unlike previous research, which has mostly focused on technology use or instructional practices, this systematic literature review examines the integration of generative AI (GenAI) into the higher education supply chain from a policy perspective. The study identified five strategic themes—ethical governance, decision-making and administration, accountability and compliance, educational supply chain transformation, and ethical student engagement—through a synthesis of 155 peer-reviewed articles. Together, these themes provide a multifaceted perspective on GenAI adoption.

Compared to the existing literature, these results confirm and extend earlier findings. For example, previous research by Pillai (2023) and Gupta and Nyamafene (2023) emphasized the importance of institutional policies and ethical guidelines for the use of AI. In addition to confirming those results, this analysis also emphasizes how these frameworks are used in academic settings, bringing institutional procedures in line with UNESCO recommendations and international norms such as the OECD AI Principles. Such as Chatterjee (2022) and Lim et al. (2023) discussed inclusivity and justice in AI design, this study shows that institutions are taking a more active role in working with developers to co-develop GenAI tools to include accessible features and ethical protections.

While previous research has identified risk mitigation strategies such as complaint methods and bias audits (Lopez and Singh, 2021; Hamdan et al., 2023), this review provides more detail by explaining how these methods are integrated into institutional workflows, particularly in areas such as plagiarism detection and admissions. Studies by Patel (2023) and Sharma and Zhao (2020) have examined the function of GenAI in strategic planning and resource allocation in the decision-making domain. Through scenario simulation and real-time analytics, this evaluation validates such applications and demonstrates the increased integration of GenAI tools into the policy cycle.

The study also adds to existing knowledge in the area of accountability and compliance frameworks. Although ethics boards and training programs were covered by Kumar and Mehta (2022) and Garcia (2021), this review provides a more comprehensive governance model that includes faculty literacy, accreditation alignment, and feedback loops. Furthermore, with full insight into resource allocation, digital learning resilience, and operational agility, this paper addresses the role of GenAI in educational supply chain management, which has received little attention in previous research.

Finally, research such as Nguyen (2022) and Tanaka (2021) have addressed the ethical application of GenAI in student engagement, including issues such as data privacy, personalized learning, and AI-related plagiarism. In addition to confirming such concerns, this research presents methods of consent and the cooperative use of teacher-student AI as new governance goals. All things considered, this study offers a transdisciplinary approach that links ethics, policy, and innovation by providing a cohesive conceptual framework that links governance inputs to institutional outputs.

The results of this review significantly expand the theoretical context of GenAI in education. First, this study expands the focus of GenAI research by combining governance, ethics, and supply chain management into one conceptual framework, rather than focusing solely on pedagogy and technical execution. Second, it identifies mediating and moderating factors—such as institutional culture, AI literacy, and regulatory environment that impact the success of GenAI policy, providing a dynamic systems approach that can be tailored to different institutional settings. Third, this review connects discussions in the AI ethics literature to educational policy analysis, suggesting a transdisciplinary framework that promotes both academic achievement and stakeholder confidence. This combination of ethical governance and practical outcomes offers a new approach to assessing AI integration in education. Ultimately, the use of PRISMA-guided SLR methodology highlights the importance of systematic synthesis in emerging technology fields, demonstrating how holistic review techniques can uncover policy-relevant insights and guide future research efforts.

For institutional leaders, policymakers, and administrators, these results provide practical strategies for the ethical integration of GenAI. Institutions should focus on creating AI policies that are in line with global

ethical standards and integrate these policies into their operational processes to guarantee transparency and accountability. Programs aimed at increasing AI literacy for faculty and staff should be established to promote responsible and ethical use, while governance frameworks, such as ethics boards and audit committees, should be created to oversee GenAI implementation and address stakeholder concerns.

By integrating GenAI tools into scenario simulation and decision support systems, strategic planning can be improved, providing greater administrative flexibility and insight. In terms of managing the educational supply chain, GenAI can enhance the allocation of resources, delivery of digital learning, and resilience of infrastructure, thereby improving institutional efficiency. Ultimately, there is a need to foster ethical engagement with students, including clear consent protocols, measures to prevent plagiarism from AI, and collaborative learning approaches that foster trust and inclusivity. By incorporating these methods into their framework, higher education systems can promote the adoption of GenAI in a sustainable, ethical and innovative manner throughout the academic environment.

Research Gaps and Future Direction

In the systematic literature review, there are several important gaps which provide a way to conduct future research in the context of GenAI adoption and governance in higher education supply chain. First of all, there lacks the longitudinal studies which tracks the long term effects of GenAI governance frameworks on the educational outcomes. The existing research focuses on short term and pilot based studies offering useful insights however lacks revealing influence of governance models on academic quality, institutional resilience and student success. The longitudinal studies are useful to gather if adoption of GenAI leads towards sustainable improvements or not. Secondly, there are some areas not explored in the context of GenAI such as equity, diversity, and inclusion. Some of the studies focuses on ethical risks and algorithmic bias however new few focused on how AI driven decision making involves with student demographics, socio-economic background and cultural identity. The research which showcase this intersection could ensure that GenAI systems contributes in fair educational opportunities. In addition to this, the cross national comparisons and global policy benchmarking are not given any identification in existing literature. As higher educational institutions work in diverse regulatory and cultural contexts, there is no comparative work on how countries are using GenAI for ethics and governance. The future research must investigate opportunities for international harmonization to check best practices and gathering common standards to guide global cooperation in governance of AI. Another issue that there are not many studies focusing on exploring participatory and co-design approaches. At present, the governance strategies are developed by policymakers and institutional leaders but they have limited input from stakeholders like AI developers, students, and faculty. The future studies could emphasize that collaborative frameworks help to develop AI policies which ensure they are technically solid and socially inclusive.

Lastly, emerging areas in the literature are not focused properly including the potential of AI-driven micro-credentialing systems for lifelong learning, blockchain-enabled academic records for greater transparency and security, and the role of AI in accreditation and audit processes. Exploring this domain could help in finding academic recognition, student mobility, and institutional accountability. Thus, this gaps identify that future research must not focus on technical adoption however more integrating perspectives from governance, ethics, pedagogy, and global policy. Thus, future work will determine that GenAI in higher education is not only innovative but also equitable, accountable, and sustainable.

2. CONCLUSION

This systematic literature review focused on administration, moral application and institutional innovation in academic supply chains led to the developing role of generative artificial intelligence (GENAI) in higher education. The Prisma method was used to synthesize the insight obtained from 155 equivalent-secured studies, and five major topics emerged: AI-enhanced educational supply chain management, accountability and compliance, moral governance, decision making and administration, and moral use in teaching, learning and student attachment. If seen overall, these subjects provide a wide understanding of the benefits and difficulties of integrating GenAI in the educational environment.

The results show that although GenAI has immense ability to increase educational privatization, institutional efficiency and flexibility in providing education, its use is still required to be supported by strong governance structure, transparent accountability systems and constant confidence of stakeholders. Institutions will have to move beyond technical signs and move to such policies that maintain a balance between innovation and accountability to solve moral issues such as bias, data privacy and algorithms ambiguity, which still remain serious problems. The integrated approach prepared in this analysis gives institutions an organized way to manage the GenAI system with the confidence of stakeholders and academic performance results, to manage to adopt responsibly.

In the future, this research emphasizes the need for better AI literacy and multi-disciplinary policy research for more strong institutional accountability systems, trainers and students. Future research should include International Policy Benchmarking, long-term impact of GenAI structure, and institutional AI policies include co-design strategies involving developers, teachers and students. Higher education institutions can proceed in these areas and take advantage of the transformative ability of GenAI by maintaining educational integrity, diversity and moral integrity

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