The Sixth Study

**Using the Application of Artificial Intelligence in Developing the Business Organization
By**

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Abstract:

The role of artificial intelligence in creativity and development in academic education. The purpose aim of this study is to assess the impact of Artificial Intelligence (AI) on education. Premised on a narrative and framework for assessing AI identified from a preliminary analysis, the scope of the study was limited to the application and effects of AI in administration, instruction, and learning. The artificial intelligence (AI) is reshaping higher education by enhancing creativity and refining academic programs. Additionally, AI analyzes educational data, informing tailored academic programs. Predictive analytics optimize course offerings and curriculum design, aligning education with industry needs.

keywords: are Education, leaner artificial intelligence, and development.

الملخص:

دور الذكاء الاصطناعي في الإبداع والتطوير في التعليم الأكاديمي. الهدف من هذه الدراسة هو تقييم تأثير الذكاء الاصطناعي على التعليم. بناءً على سرد وإطار لتقييم الذكاء الاصطناعي تم تحديده من خلال تحليل أولي، اقتصر نطاق الدراسة على تطبيق وتأثيرات الذكاء الاصطناعي في الإدارة والتعليم والتعلم. يعيد الذكاء الاصطناعي تشكيل التعليم العالي من خلال تعزيز الإبداع وصقل البرامج الأكاديمية. بالإضافة إلى ذلك، يحلل الذكاء الاصطناعي البيانات التعليمية، ويزود البرامج الأكاديمية المصممة خصيصًا. تعمل التحليلات التنبؤية على تحسين عروض الدورات وتصميم المناهج، ومواءمة التعليم مع احتياجات الصناعة.

الكلمات المفتاحية: التعليم، والذكاء الاصطناعي الأكثر رشاقة، والتطوير.

1- Introduction:

Artificial Intelligence (AI) has become increasingly integrated into various facets of society, including higher education. In this context, its role in fostering creativity and shaping academic programs has garnered significant attention. Circumnavigating the confluence of artificial intelligence and education for sustainable development in the era of manufacture 4.0 challenges, opportunities, and ethical scopes. As illustrated by Henry Ford in the analogy, innovation does not mean working that the society should work only with what has been the norm, such as finding ways of making horses faster. Sometimes, it is necessary to search beyond the norm, develop new ways of doing things.

This paper seeks to offer a thorough and evaluative examination of the incorporation of AI tools in education, particularly within the framework of ESD. By shedding light on its transformative potential, addressing ethical considerations,

A- The Artificial Intelligence in Education Progresses and challenges.

The Artificial intelligence (AI) has become one of the most powerful tools in shaping the future of education. The Artificial Intelligence in Education Stressing the importance of ongoing learning, and underlining the value of industry collaborations, this paper contributes to the continuing discourse on the changing educational landscape in a worldwide connected and technologically advanced environment. Through a detailed investigation of research outcomes, this paper aims to equip academic institutions with the knowledge and strategies necessary for fruitfully navigating the challenges and prospects stemming from these advancements.
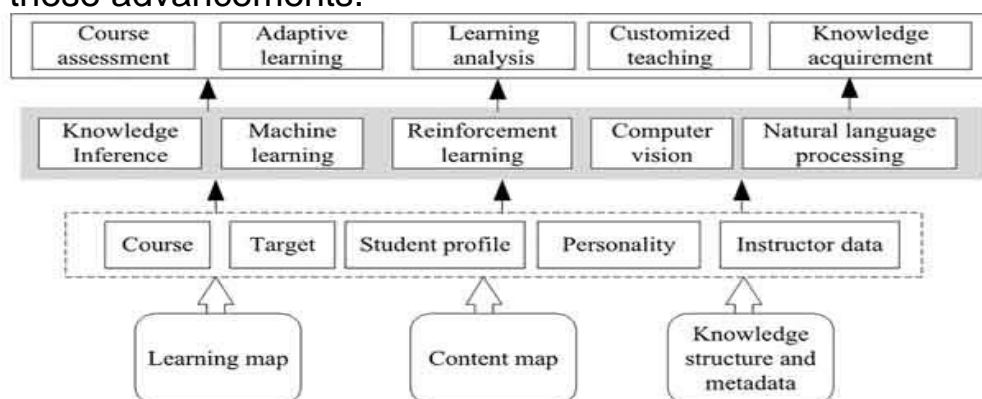

FIGURE 1.

As shown in Fig. 1, the model helps build a data map that is crucial for improving learning and establishes structures and association rules for collected education data. The model works as a core in AI system, with technologies providing power for a system.

1- Technological structure of AI education.

How Artificial Intelligence is transforming Learning? Perception through which future generations acquire knowledge and skills to thrive in an ever-evolving AI is defined as the ability of machines to simulate human intelligence and learn from the experience. In world. However, the world is

changing dizzily, and education must also be a fundamental support to society.

Throughout history, it has been the means to adapt. In the educational context, this means machines can assist students in learning way more efficiently and personally.

Let us explore how AI is transforming education and its role in shaping the future classroom.

	The work AI can do in education
Administration	• Perform the administrative tasks faster that consume much of instructors' time, such as grading exams and providing feedback. • Identify the learning styles and preferences of each of their students, helping them build personalized learning plan. • Assist instructors in decision support and data-driven work. • Give feedback and work with student timely and directly.
Instruction	• Anticipate how well a student exceed expectations in projects and exercises and the odds of dropping out of school. • Analyze the syllabus and course material to propose customized content. • Allow instruction beyond the classroom and into the higher-level education, supporting collaboration. • Tailor teaching method for each student based on their personal data. • Help instructors create personalized learning plans for each student.
Learning	• Uncover learning shortcomings of student and address them early in education. • Customize the university course selection for students. • Predict the career path for each student by gathering studying data • Detect learning state and apply intelligent adaptive intervention to students.

2- Personalized Learning: Adapting Education to Individual Needs; Automation of Administrative Tasks.

- Personalized Educational Content.
- Virtual Tutoring and Online Interaction.
- Data Analysis and Educational Predictions.
- Access to Education Anytime, Anywhere.
- Development of 21st Century Skills.
- Challenges and Ethics of AI in Education.

3- Personalized Learning:

Adapting Education to Individual Needs; Automation of Administrative Tasks. - Personalized Educational Content. - Virtual Tutoring and Online Interaction. - Data Analysis and Educational Predictions. - Access to Education Anytime, Anywhere. - Development of 21st Century Skills. - Challenges and Ethics of AI in Education. The application of AI algorithms and systems in education are gaining increased interest year by year. Fig. 2 shows the rising number of papers published in the topics "AI" and "Education" from Web of Science and Google scholar since 2010. Note that the papers published in

2015–2019 accounted for a large proportion, i.e., 70% of all the papers indexed. As education evolves, researchers are trying to apply advanced AI techniques, i.e., deep.
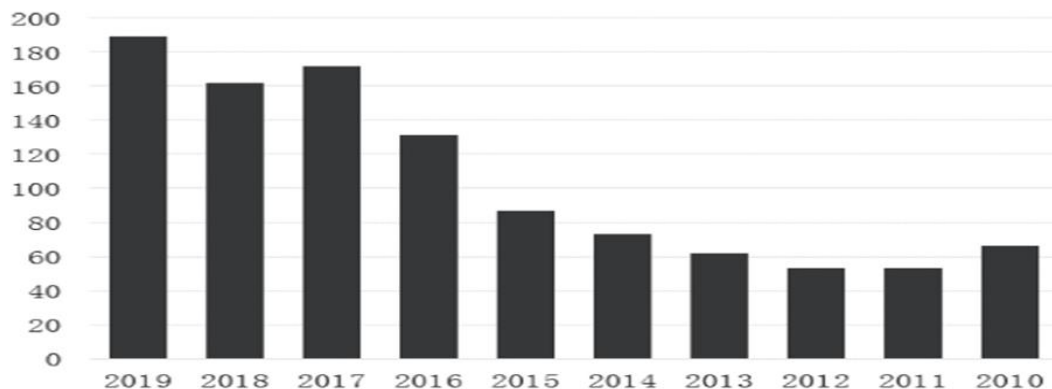

FIGURE 2.
Papers in Web of Science and Google Scholar in the last ten year with key words "AI" and "Education".

B- Artificial Intelligence in Education Developments and challenges.

1-The rise of Industry 4.0 heralds a significant shift in business and industry dynamics, propelled by advanced technologies such as automation, the Internet of Things (IoT), artificial intelligence (AI), smart factories, and cyber-physical systems. This paradigm promises substantial benefits, including increased productivity, sustainable growth, and improved resilience. However, the adoption of Industry 4.0 faces challenges, particularly in the demand for a skilled workforce adept in information technology and data analytics. Higher education institutions (HEIs) play a pivotal role in addressing this need by updating curricula and enhancing infrastructure. Concurrently, the significance of education for sustainable development (ESD) has been underscored by global initiatives like the Sustainable Development Goals (SDGs), fostering accountability for economic, environmental, and equitable well-being. As digital technologies blur industry boundaries, education must adapt to evolving demands. The integration of AI tools in education has emerged as a catalyst for reshaping learning paradigms, driving innovation, and preparing individuals for the digital era. AI chatbots, such as ChatGPT, have garnered attention for their potential to revolutionize education. However, their integration raises

ethical concerns, necessitates curriculum redesign, requires strategies for ongoing learning, and demands alignment with industry standards.

Despite the promising potential of AI in education, there exists a gap in the literature regarding ethical implications, the influence of AI on ESD, the restructuring of Bloom's Taxonomy, collaboration between academia and industry, strategies for continuous learning, and effective AI tool integration for personalized learning. This paper critically examines the integration of AI tools, particularly ChatGPT, in education within the context of ESD. It explores transformative potential, ethical considerations, the imperative for continuous learning, and the role of industry partnerships. By offering insights and strategies, this paper contributes to the discourse on the evolving nature of education in a technologically driven world, empowering academic institutions to navigate the complexities and opportunities of AI integration in education more adeptly.

As digital technologies blur industry boundaries, education must adapt to evolving demands. The incorporation of AI tools into education has emerged as a transformative force, reshaping learning experiences, fostering innovation, and preparing individuals for the digital era. AI chatbots like ChatGPT have garnered widespread attention for their potential to revolutionize education. However, their integration raises ethical concerns, necessitates curriculum redesign, and requires strategies for continuous learning aligned with industry standards.Despite the promising potential of AI integration in education, there exists a notable gap in the literature regarding ethical implications, the influence of AI on ESD, the impact on Bloom's Taxonomy, collaboration between academia and industry, strategies for continuous learning, and effective integration for personalized learning. This paper critically examines the integration of AI tools, particularly ChatGPT, in education within the context of ESD. It explores transformative potential, ethical considerations, imperatives for continuous learning, and the role of industry partnerships. By offering insights and strategies, this paper contributes to the ongoing discourse on the evolving nature of education in a

technologically driven world, empowering academic institutions to navigate AI integration more effectively.

The onset of the fourth industrial revolution, Industry 4.0, has sparked significant transformations in the operational landscape of businesses and industries. This revolution is characterized by cutting-edge technologies such as automation, system integration, decentralization, the Internet of Things (IoT), Artificial Intelligence (AI), smart factories, simulation, data analytics, cloud manufacturing, big data, and cyber-physical systems. These technologies offer numerous advantages, including accelerated enterprise growth, enhanced productivity, improved process management, sustainable progress, and increased resilience. The transition from Industry 3.0 to Industry 4.0 is focused on achieving digitalization, integrating digital, physical, and biological systems to create a seamless virtual domain.

The UN Conference on Environment and Development in 1992 highlighted higher education's vital role in promoting sustainability, further emphasized by the Decade of Education for Sustainable Development from 2005 to 2014. Terms like "sustainable education" focus on fostering economic, ecological, and equitable well-being. ESD offers a framework for instilling responsibility across all ages, encouraging proactive participation in achieving SDGs. It equips individuals to make informed choices for environmental resilience, economic prosperity, and a secure future.
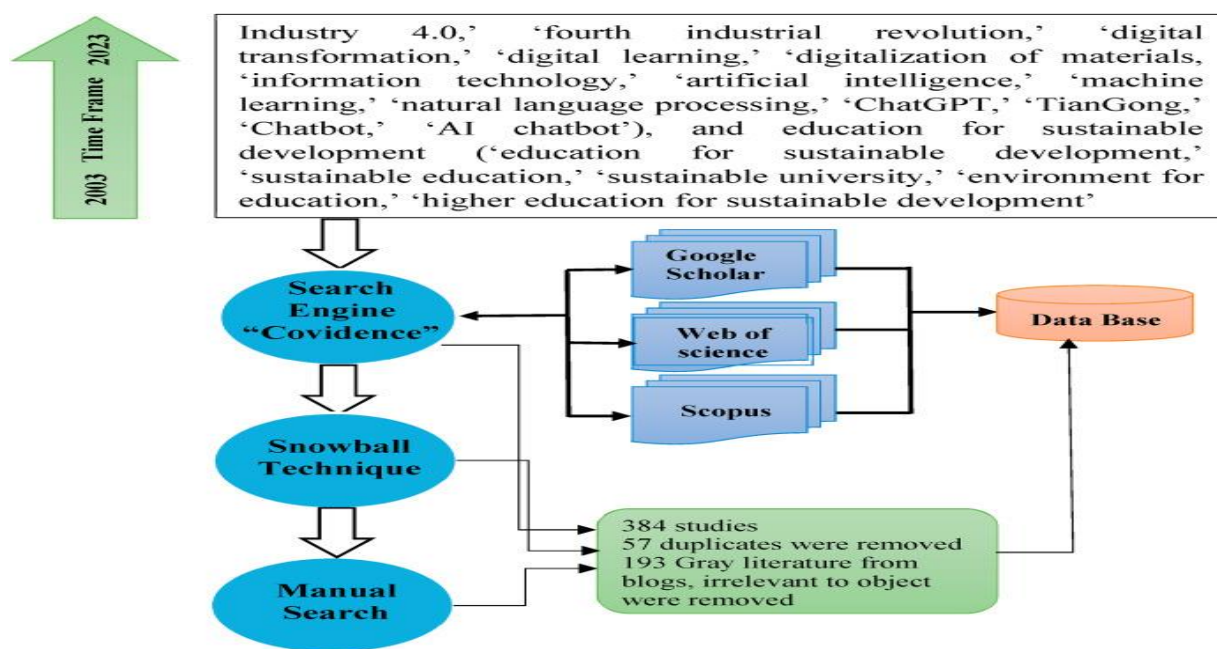
Fig. 1. Flowchart of literature search for scoping review on the intersection of AI and ESD in the era of industry 4.0.

As digital technologies merge with physical systems, redefining industry boundaries, education faces a pivotal moment. Traditional educational models must adapt to changing demands and opportunities. In this dynamic environment, integrating AI tools into education is pivotal, reshaping learning, fostering innovation, and preparing individuals for the digital era. The convergence of AI and education signifies a significant shift, offering both promises and complexities. Tools like ChatGPT and advanced language models show potential to revolutionize education, from content creation to interactive engagement.

ChatGPT, an AI chatbot utilizing natural language processing, has rapidly gained widespread attention in contemporary culture. Its emergence has sparked extensive discussions across scientific and societal realms. As the first significant large language model (LLM) to achieve such recognition among the general population, ChatGPT represents a milestone. LLMs, like Elicit, Med-PaLM, and Tiangong AI, exhibit proficiency in generating text responses to prompts, albeit with limitations. The latest version, GPT-4, can also analyze information from images, expanding its potential applications, particularly in education, healthcare,

and research. However, as these tools become more prevalent in education, ethical considerations, curriculum design, continuous learning, and industry alignment become paramount concerns.

2- Methodology

Employed in this study was a scoping review focusing on the integration of AI tools in education within the context of ESD. Unlike systematic reviews, which focus on specific research questions, scoping reviews take a broader approach (Peters et al., 2015; Pham et al., 2014) to provide a comprehensive overview of existing literature (Thomas et al., 2019).. They aim to map out key concepts, sources, and types of evidence available in a research area, helping identify gaps in the literature. Scoping reviews are particularly suitable for emerging or evolving topics as they offer a comprehensive overview of evidence rather than a quantitative or qualitative synthesis of data.

Methodological framework

Studying and investigating how AI affects ESD is a complex endeavor, requiring a comprehensive framework that addresses different aspects of the subject. To conduct this research effectively, it's essential to adopt a structured approach. The proposed framework (refer to Fig. 2) comprises interconnected steps, starting with defining key concepts and objectives.
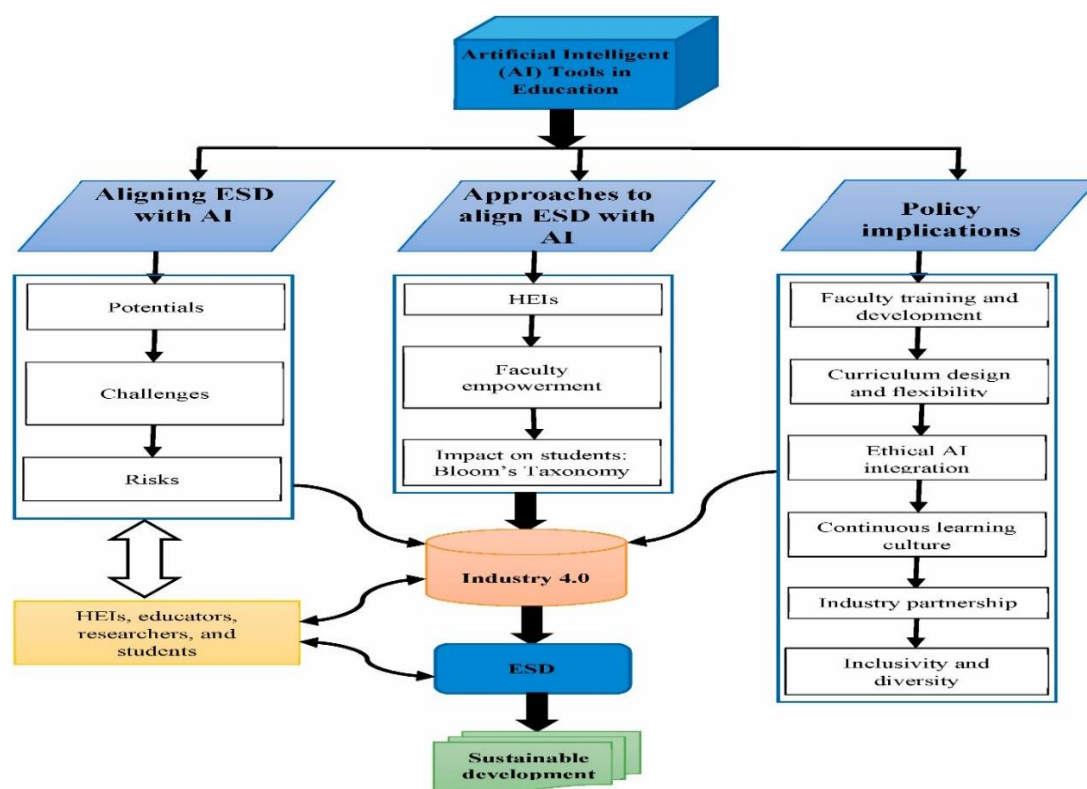
Fig. 2. Framework of the study.

These steps involve grasping the principles of ESD, examining AI's role in education, and considering the involvement of HEIs. A literature review was carried out to identify existing knowledge.

3- Results

Bloom's Taxonomy (Fig. 3a), a framework for categorizing educational objectives, has been a valuable tool for educators for many years. While it provides a structured way to think about educational goals and objectives, it is not a static framework and has seen adaptations and modifications over time to meet the changing needs of education. The introduction of AI, including chatbots like ChatGPT, into education does raise some interesting questions about how we approach teaching and learning. AI can provide new tools and opportunities for personalized learning, instant feedback, and access to vast amounts of information. However, it also raises concerns about the role of human educators, the need for critical thinking skills in an age of readily available information, and the ethical use of AI in education. Modifying Bloom's Taxonomy to address the impact of AI and chatbots

on education is certainly a possibility, but it should be done thoughtfully and with a clear understanding of the implications.

Fig. **3**. Framework of the study.

Adapting Bloom's Taxonomy for AI integration in education can enhance traditional goals but requires careful consideration and collaboration. While it may not explicitly cover AI-related concepts, modifying the taxonomy can ensure alignment with evolving educational needs. Educators may need to adjust teaching methods for effective AI incorporation, emphasizing higher-order thinking, active learning, and student engagement. Collaboration with stakeholders is crucial to ensure a thoughtful and effective adaptation to the changing educational landscape influenced by AI and technology.

4**. Discussion**

In the era of Industry 4.0, Education for Sustainable Development (ESD) is crucial for preparing students for a sustainable and technologically advanced future. It involves creating an institutional ecosystem supporting sustainability principles, aligning curricula with industry demands, and fostering a sustainability mindset among students. While Bloom's Taxonomy remains relevant, adapting it to integrate AI in education requires careful consideration and collaboration with stakeholders. AI offers opportunities for personalized learning, real-time data analysis, and enhanced skills relevant to Industry 4.0, but it also poses challenges such as the digital divide and bias. HEIs must navigate these challenges to harness AI's potential responsibly. Personalized learning, facilitated by AI tools like ChatGPT, tailors education

to individual student needs, enhancing understanding and autonomy. Incorporating AI into personalized learning requires transparent algorithms, collaboration with AI developers, and data-driven approaches to assessment. Interdisciplinary collaboration facilitated by AI can address complex global challenges, while assessment methods should evolve to measure holistic competencies essential for Industry 4.0.

Fig. 3a. Bloom's taxonomy.

Fig. 3b. Should Bloom's Taxonomy modified due to the evolution of AI in education?

In the era of Industry 4.0, Education for Sustainable Development (ESD) fosters critical thinking and problem-solving skills essential for addressing global challenges. Integrating sustainability principles into education equips students with interdisciplinary skills needed for Industry 4.0 sectors. ESD emphasizes responsible resource use and ethical considerations, crucial for sustainable implementation of advanced technologies.

While AI offers opportunities for personalized learning and data-driven insights into sustainability, it also poses challenges such as bias and overreliance. Higher education institutions (HEIs) must navigate these challenges to

effectively leverage AI for ESD, ensuring ethical use while shaping the future of education.

The subsequent stages explore AI technologies and their potential, challenges, and risks in education, as well as investigating their impact on teaching and learning, curriculum development, data privacy, and student outcomes. The framework further addresses various strategies to align ESD with AI, including institutional and policy implications, ethical considerations, and bridging the education-industry gap in the Era of Industry 4.0. Ultimately, the research concludes with results and discussion sections, summarizing key findings and their significance for the field. This structured approach ensures a comprehensive examination of AI's role in advancing ESD, covering technological, educational, ethical, and policy perspectives, while also identifying research gaps.

3.1. Reimagining and Rethinking Education for Sustainability in the Era of Industry 4.0: Cultivating Innovators for a Sustainable and Technologically Advanced Future.

ESD centers on establishing an institutional "ecosystem" designed to provide efficient support services capable of promptly addressing the needs of students and employers regarding the application of sustainability principles across various domains and activities (Baker-Shelley et al., 2017; Paletta et al., 2019; Staniˇskis and Katiliute, 2016).

The challenge lies in developing a pedagogical framework that accommodates this specific type of student training and the impartation of relevant competencies (Disterheft et al., 2015).

Universities are thus compelled to reassess their academic curricula, aligning them more closely with the demands of the labor market while remaining responsive to the training needs identified by employers (Plaias et al., 2011).

This involves integrating elements that facilitate the lasting reinforcement of taught material (Jora et al., 2020) and raising public awareness of sustainable development, its

various dimensions, and fundamental principles, thereby fostering a supportive mindset toward the concept.

Reimagining Bloom's Taxonomy: Adapting to AI in Education

In the context of integrating AI, such as ChatGPT, with Bloom's Taxonomy, it is crucial to explore how AI can enhance the educational process. The concept of knowledge co-creation mirrors active engagement within the teaching-learning framework, enhancing the appeal of learning and fostering increased motivation and enthusiasm among students. They demonstrate a heightened interest in digital educational solutions (Blau and Shamir-Inbal, 2017), with co-creation fostering ongoing dialogue between learners and educators (Catherine Bovill, 2014).

3-2 Integrating AI into ESD for Industry 4.0 presents challenges: the digital divide limits access, AI bias raises ethical concerns, rapid tech changes require continuous updates, and institutional resistance hinders adoption. Addressing these challenges is crucial for equitable, effective AI-driven education.

5- **Policy implications:**

In the developing landscape of education in Industry 4.0, policy effects are crucial for adapting to dynamic needs. Education policies should advocate for flexible curricula combination technical information with higher-order skills, maintained by periodic reviews and experiential learning. Comprehensive training programs for educators are essential, concentrating on AI technologies, ethics, and innovative education systems. Integration of AI ethics education throughout the curriculum is vital, through dedicated courses, workshops, and awareness campaigns. These policies ensure students are prepared not only technically but also ethically for the challenges of the modern world.

6- **Conclusion**;

This study establishes the groundwork for examining AI integration in education amidst Industry 4.0, emphasizing the role of Higher Education Institutions (HEIs). Recognizing the significance of Education for Sustainable Development (ESD), AI's transformative potential, and the challenges it presents, including ethical considerations and curriculum design, are highlighted. Bridging existing literature gaps is imperative. The crucial role of ESD in preparing students for Industry 4.0 is emphasized, along with AI's potential benefits and challenges, necessitating comprehensive strategies for effective integration. Ultimately, this synthesis offers a transformative opportunity to equip learners with technical skills, critical thinking, and ethical awareness, requiring collaboration among stakeholders for a sustainable future.

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