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BASIC EDUCATION IN THE AI ERA: A CRITICAL ANALYSIS IN A PHILOSOPHICAL ANALYSIS

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ABSTRACT

This study presents a systematic literature review (SLR) that explores philosophically the integration of Artificial Intelligence (AI) in basic education, focusing on students' moral, character, and identity development. The review analyzed 24 peer-reviewed studies published between 2020 and 2025 using thematic and interpretive analysis. The results identified five key themes: ethical use of AI, teachers' roles, student data privacy, school–family collaboration, and curriculum integration. The findings show that AI driven mainly by efficiency may erode humanistic values, while holistic applications that combine cognitive, affective, and socio-emotional aspects support responsible and human-centered learning. This study offers a humanistic philosophical framework that connects ethics and pedagogy to guide teachers, policymakers, and educational institutions in implementing AI to improve learning outcomes and foster moral maturity and social responsibility. Overall, the review highlights the importance of aligning AI use in basic education with philosophical and ethical reflection to prepare critical and morally grounded learners.

INTRODUCTION

The rapid advancement of artificial intelligence (AI) signals a profound socio-technical transformation that affects education worldwide. Artificial Intelligence (AI) not only influences social, economic, and industrial structures, but also fundamentally reshapes the way humans think, interact, and learn (Chatzichristofis, 2025). In the context of basic education, the emergence of AI brings two essential conceptual dimensions. On one hand, AI offers innovative potential to develop adaptive, interactive, and personalized learning that allows for more accurate instructional differentiation for learners. On the other hand, its application raises substantial challenges regarding the integration of educational values, the ethics of technology use, and the deep meaning of the learning process, which require critical reflection from educators and policymakers (Mutmainnah et al., 2025). Basic education does not merely serve as a means of knowledge transfer or technical skill mastery, but as a foundation for the formation of rationality, morality, and social awareness in children, thus contributing to their development as complete and dignified individuals. Therefore, the integration of AI in learning

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must be critically examined to ensure that its implementation does not shift the educational orientation from holistic human development toward mechanization or mere technological efficiency (Relmasira, Stefanus, 2022).

Philosophically, basic education plays a vital role as the initial stage in which learners begin to develop patterns of reasoning, human values, and their identity as members of the global community. From the perspective of educational philosophy, the goal of learning is not only to master material or skills but to shape individuals who are capable of critical, reflective, and morally wise thinking (Karpouzis, 2024). However, with AI becoming an integral part of learning, fundamental questions arise: will AI strengthen or diminish the human dimension of education? Will learners become mere consumers of technology, or will they remain active subjects capable of interpreting and transforming knowledge? Without deep philosophical reflection, the use of AI risks reducing the affective, social, and ethical aspects that characterize humanistic-oriented education.

From an ethical standpoint, the application of AI in classrooms requires high moral responsibility from both educators and learners. Teachers should not only act as conveyors of information but as facilitators, mediators of human values, and guides for critical reflection on technology use (Ray & Fitrah, 2025). Meanwhile, students must be guided to use AI responsibly, respect privacy, and understand the boundary between technological assistance and intellectual autonomy (Verawati et al., 2024). Ethical principles such as academic honesty, fairness of access, and respect for human dignity must underpin AI-based learning. An approach integrating human-centered AI principles—where technology is positioned as a tool supporting holistic learner development rather than an end in itself—has proven essential for fair, safe, and meaningful AI adoption in elementary schools (Khosibah et al., 2025; Susanti, 2025).

The transformation of AI-based learning demands a balance between technological sophistication and moral wisdom, which lies at the core of humanistic education. Without strong ethical awareness, the progress of AI risks degrading learning quality, displacing human values, and diminishing students' capacity for critical and reflective thinking (Khosibah et al., 2025). Therefore, AI implementation in elementary schools must be accompanied by pedagogical strategies emphasizing character building, empathy, and social responsibility. Education should not solely focus on mastering tools and algorithms but also on cultivating students' moral and social awareness, ensuring they act as responsible learning subjects for themselves, society, and the future. This study thus aims to examine basic education in the era of artificial intelligence (AI) through a philosophical and ethical perspective and to formulate a humanistic conceptual framework for digital learning. The analysis is expected to contribute conceptually to developing an educational paradigm that is responsive to technological advancement while grounded in human values. Accordingly, this research seeks to answer the following questions:

1. *What are the main philosophical and ethical issues raised by AI in basic education?*
2. *How can a humanistic framework guide responsible AI integration in primary schools?*

RESEARCH METHODS

This study uses a qualitative approach through the Systematic Literature Review (SLR) method, focusing on conceptual and reflective analysis of the phenomenon of artificial intelligence (AI) application in the context of basic education. This approach was chosen because it allows argumentative synthesis of conceptual developments in academic literature, making it suitable for examining philosophical and ethical issues in education that are reflective and normative. Through the SLR method, this research seeks to integrate previous scientific findings to construct a systematic, in-depth, and humanistic framework relevant to educational development in the digital era.

Searches were conducted across Google Scholar, Scopus, ScienceDirect, and DOAJ between January 2020 and May 2025 using the keywords *"Artificial Intelligence in Education," "ethical learning," "philosophy of education,"* and *"AI in elementary school."* A total of 190 initial records were identified. After removing 20 duplicates, 170 articles remained for screening. At this stage, 90 articles were excluded because they focused solely on technical or system-engineering aspects of AI without educational relevance. Subsequently, 80 full-text articles were assessed for eligibility. All full texts were accessible. After a secondary review, 56 articles were excluded for lacking pedagogical or moral-ethical dimensions, leaving 24 articles for final inclusion.

Inclusion criteria:

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1. Publications in English or Indonesian
2. Peer-reviewed journal articles, book chapters, or conference proceedings
3. Published between 2020–2025
4. Explicitly discuss AI in basic education, particularly focusing on moral values, educational philosophy, or character development.

Exclusion criteria:

1. Studies emphasizing technical or engineering aspects of AI without ethical or pedagogical focus
2. Duplicates or inaccessible full-texts
3. Research outside the educational domain, such as robotics or computational design.

Quality Assessment and Inter-Rater Reliability

Each article was evaluated using the Critical Appraisal Skills Programme (CASP) checklist to assess clarity, rigor, and relevance. Studies scoring below 60% on CASP quality indicators were excluded. Two reviewers independently screened and coded the studies. The inter-rater reliability measured by Cohen's Kappa ($\kappa = 0.87$) indicated strong agreement. Discrepancies were resolved through discussion and consensus.

Data Analysis and Thematic Coding

Thematic analysis followed the six-step protocol of Braun and Clarke (2006) and was conducted manually to ensure conceptual depth. The stages included:

1. Familiarization with literature,
2. Open coding (e.g., AI and moral reasoning, teacher as ethical mediator, privacy in learning),
3. Axial coding (e.g., ethical literacy, human-centered AI, learning autonomy),
4. Selective coding integrating philosophical categories such as humanism, existential responsibility, and educational ethics,
5. Refining and defining themes,
6. Building a narrative synthesis linking ethical theory and educational practice.

The Coding Revealed Four Overarching Themes:

1. Human nature in AI-based education
2. Teachers' roles in digital learning ethics
3. moral dilemmas in learning automation, and
4. humanistic approaches to educational technology.

The following SLR diagram shows the systematic flow of literature selection for this study, from the initial search to the article that was finally analyzed in depth. Each stage indicates the number of articles and the main focus that is considered in the selection process. The following SLR chart is adopted and modified from the PRISMA guide Elfiyani (2024) to fit the context of this research.

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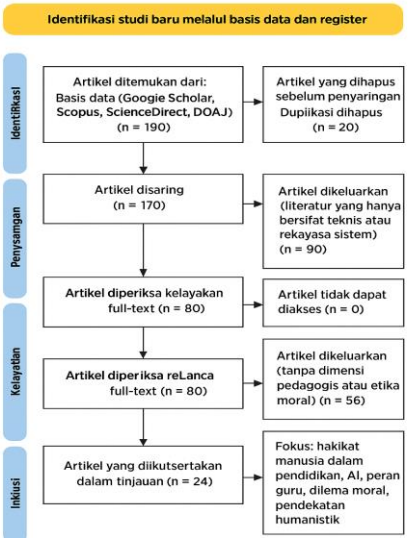

Figure 1. PRISMA Stage

RESULTS

The results of this systematic literature review (SLR) provide a descriptive summary of the 24 peer-reviewed studies analyzed, highlighting the philosophical, ethical, and pedagogical dimensions of Artificial Intelligence (AI) in basic education. Searches were conducted across Google Scholar, Scopus, ScienceDirect, DOAJ, and Publish or Perish. From the initial 190 records, 20 duplicates were removed, 170 titles and abstracts were screened, and 80 full texts were assessed for eligibility. Based on inclusion and exclusion criteria-English or Indonesian language, published between 2020–2025, peer-reviewed sources focusing on AI and basic education 24 studies were selected for thematic analysis.

Table 1. Journal Review

No	Article Title and Author's Name	Article Summary	Results and Findings	Topic Relevance
1	Ethical principles for artificial intelligence in K-12 education. Adams, C., Pente, P., Lemermeyer, G., & Rockwell, G. (2023)	Discusses ethical principles for the use of AI in primary and secondary education.	Provide guidance for responsible, inclusive, and equitable use of AI.	It is important to ensure AI is used ethically in primary education.
2	Unveiling the Shadows: Beyond the Hype of AI in Education Al-Zahrani, A. M. (2024)	Criticize AI claims and discuss the potential risks of using AI in education.	Shows that AI implementation requires critical awareness and supporting policies.	Relevant for critical analysis of AI in primary education.
3	Ethics of Utilizing Artificial Intelligence in Education: Educating a Generation Responsible for Technology Beti Malia Rahma Hidayati, I. N. S. (2024)	Discuss the ethics of using AI and digital character education.	Emphasizing the importance of forming responsible students in the use of technology.	Support the focus on the integration of moral values in basic education in the AI era.

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No	Article Title and Author's Name	Article Summary	Results and Findings	Topic Relevance
4	AI in Education: Towards a Pedagogically Grounded and Interdisciplinary Field Chatzichristofis, S. A. (2025)	Discuss AI from a pedagogical and multidisciplinary perspective.	AI can improve learning if it is designed with a pedagogical foundation.	Provide a pedagogical framework for
5	Ethics of Artificial Intelligence: A New Challenge in Moral Philosophy Desisca, A., Ramadhanti, E., & Khan, A. (2025)	Examine the ethical implications of AI in education and moral philosophy.	AI requires ethical guidelines to protect human values.	Relevant for philosophical analysis in primary education.
6	Systematic Literature Review: Problem-Based Learning Model in Elementary School Mathematics Education Elfiyani. (2024)	Review of the Problem-Based Learning (PBL) model in elementary mathematics learning.	PBL improves students' critical thinking and problem-solving skills.	Give an example of the integration of problem-based methods with AI.
7	National Character Building Through Humanities Education Ki Hajar Dewantara in Responding to Indonesian Human Stereotypes Fitriyani, A., & Parhan, M. (2024)	Explain humanistic education for the development of national character.	Emphasizing moral, social, and cultural values in learning.	Relevant to humanistic approaches in the AI era.
8	The Role of Parents in Shaping Children's Character During the Covid-19 Pandemic: Islamic Education Perspective Hadi Prabowo, S., Fakhruddin, A., & Rohman, M. (2020)	Examining the role of parents in supporting children's character during the pandemic.	Parental involvement strengthens students' character and social readiness.	It is important for teacher-parent collaboration in the age of AI.
9	Artificial Intelligence in the Philosophy of Science Construct: Human Existence as an Educational Subject Hendriawan, P., Lisdiana, L., Rahma, D. S., Irawan, & Hasanah, A. (2024)	Discuss AI and the position of humans as subjects	Affirming AI as a support tool, not a substitute for teachers.	Supporting the perspective of educational philosophy in AI.
10	The Implementation of Research-Based *Merdeka Belajar* Curriculum in Islamic Religious Education Study Programs in Indonesia Ikhwan, A., Zukhrufin, F. K., Subhan, M., Sormin, D., & Khasanah, U. (2025)	Examining the implementation of the research-based Independent Learning curriculum.	Research-based learning improves conceptual and ethical understanding.	Giving an example of the integration of innovative curriculum in primary education.
11	Artificial Intelligence in Education: Ethical Considerations and Insights from Ancient Greek	Linking the ethical principles of AI to	Provide a reflective and ethical framework in the use of AI.	Relevant to the philosophical and

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No	Article Title and Author's Name	Article Summary	Results and Findings	Topic Relevance
	Philosophy Karpouzis, K. (2024)	ancient Greek philosophy.		ethical foundations of basic education.
12	The Potential and Practice of Artificial Intelligence (AI) Literacy in Early Childhood Education in Indonesia: Systematic Literature Review Khosibah, S. A., Rahmaningrum, A., & Kusumawardani, C. T. (2025)	Review of AI literacy in early childhood.	Showing the need for developing AI literacy from an early age.	Provide initial guidance on AI literacy in elementary schools.
13	Teaching Religious Studies with Artificial Intelligence: A Qualitative Analysis of Lesotho Secondary Schools Teachers' Perceptions Kurata, L., Ayanwale, M. A., Molefi, R. R., & Sanni, T. (2025)	Analysis of teachers' perceptions related to AI in religious education.	Teachers need ethical competence to utilize AI.	Relevant for the development of teacher competencies in primary education.
14	Digital Transformation in Education: A Critical Review in Philosophical Review Lestari, I. D., Herlambang, Y. T., & Muhtar, T. (2025)	A philosophical study of the impact of digitalization and AI.	Emphasizing the balance between technology and human values.	Supporting a critical and humanistic approach in primary education.
15	The Application of Artificial Intelligence in Education in the Era of the Industrial Revolution 4.0 Maola, P. S., Karai Handak, I. S., & Herlambang, Y. T. (2024)	The implementation of AI in primary schools and its impact on learning.	AI can improve students' learning efficiency and adaptation.	Relevant for practical strategies for the use of AI in elementary school.
16	Primary School Teachers' Opinions on the Use of Artificial Intelligence in Educational Practices Mazı, A., & Yıldırım, İ. O. (2025)	Survey of elementary school teachers' perception of AI.	Teachers demonstrate the need for AI training and literacy.	Supporting teacher competency development for AI.
17	Fairness, Accountability, Transparency, and Ethics (FATE) in Artificial Intelligence (AI) and Higher Education: A Systematic Review Memarian, B., & Doleck, T. (2023)	Systematic review of FATE principles in education.	Emphasizing the importance of fairness and accountability in AI.	Provide an ethical framework for AI in elementary schools.
18	Futuristic Pedagogics: A New Paradigm of Education in Building Indonesia's Golden Generation 2045	A collaborative and visionary educational paradigm in the AI era.	Teachers as facilitators of values and ethics; AI as an instrument.	Provide futuristic pedagogic guidance in primary education.

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No	Article Title and Author's Name	Article Summary	Results and Findings	Topic Relevance
	Munandar, A. A., Herlambang, Y. T., & Muhtar, T. (2025)			
19	The Use of AI as a Learning Media in Early Childhood Education Mutmainnah, M., Caroline, N., & Margawati, M. (2025)	AI as an early childhood learning medium.	Improve children's interactivity and cognitive skills.	Relevant for AI-based learning at the early stage.
20	Integrating Deep Learning Techniques for Personalized Learning Pathways in Higher Education Naseer, F., Khan, M. N., Tahir, M., Addas, A., & Aejaz, S. M. H. (2024)	Deep learning integration for learning personalization.	Helping to adapt learning methods according to the needs of students.	Relevant for the application of personalization AI in elementary school.
21	Science and Technology in Human Life: A Review in Philosophical Perspectives Nurazizah, T. S., Ulfiah, Z., & Herlambang, Y. T. (2024)	A philosophical study of the relationship between humans and technology.	Emphasizing the humanization of the use of AI.	Supporting humanistic philosophy in primary education.
22	Educational Technology: The Effectiveness of the Use of Technology-Based Learning Media in the Digitalization Era Permana, B. S., Hazizah, L. A., & Herlambang, Y. T. (2024)	The effectiveness of technology-based learning media.	Demonstrate the role of teachers in the integration of AI with humanistic principles.	It is essential for the effective and ethical implementation of AI in elementary school.
23	Human-Centered AI: Designing Intelligent Systems that Empower, Not Replace Purwanto, A. N. I. (2025)	AI should empower students without replacing teachers.	Emphasizing AI fairness, inclusion, and transparency.	Relevant for human-based AI strategies in elementary school.
24	A Critical Review of Teaching and Learning Artificial Intelligence (AI) Literacy: Developing an Intelligence-Based AI Literacy Framework for Primary School Education Yue Yim, I. H. (2024)	Study of AI literacy and development of AI learning frameworks in elementary schools.	Emphasizing ethical and creative mastery of AI from an early age.	Provide AI literacy guidance for primary education.

Furthermore, to clarify the direction and tendency of the research focus, a classification was carried out of twenty-four articles that had been reviewed based on the study theme that was most prominent and relevant to the issue of basic education in the era of artificial intelligence. This classification aims to identify the pattern of thinking, the direction of concept development, as well as the theoretical and practical contribution of each research to the discourse of educational philosophy in the digital era. The results of the grouping are presented in Table 2, entitled "Classification of Article Studies Based on the Theme of Basic Education in the AI Era: Critical Studies in a Philosophical Perspective.". This classification includes four main themes that describe academic tendencies in examining the relationship between technology, human values, and basic education practices, namely:

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Table 2. Classification of Article Studies by Theme

Main Themes	Number of Articles	Present (%)
The philosophical foundation and ethics of Education in the AI Age	8	33,3
The transformation of subjects, teachers, and human values in the digital age	6	25
Pedagogical implications and AI-based learning innovations in primary education	7	29,2
Critical review and challenges of AI implementation in education	3	12,5
Total	24	100.0

DISCUSSION

A. Role of Teacher and Curriculum

AI in primary education presents ethical challenges including academic integrity, algorithmic bias, and privacy concerns (Adams et al., 2023; Al-Zahrani, 2024; Kurata et al., 2025; Memarian & Doleck, 2023). Clear policies and ethical standards are necessary to protect students' rights while maintaining fairness, transparency, and accountability. Teachers are moral agents balancing technology use with character education and ethical literacy. Research by Hendriawan et al (2024) and Maola et al (2024) emphasizes that AI should not replace teachers but serve as a supportive instrument to enhance pedagogical interaction and strengthen students' moral and cognitive development. In this context, curriculum development must integrate ethical and social values alongside technology to foster creativity, independence, and moral growth (Naseer et al., 2024; Southworth et al., 2023; Y. Wang & Li, 2024). An adaptive curriculum ensures AI contributes to learning efficiency while nurturing students' reflective and empathetic capacities.

B. Role of Teachers & Curriculum

Teachers act as facilitators of values, ensuring that AI supports learning without replacing human interaction (Hendriawan et al., 2024; Maola et al., 2024). Curriculum design must integrate technology with ethical and social values to foster creativity, independence, and moral development (Southworth et al., 2023; S. Wang et al., 2024). This approach aligns with Dewey's pragmatism and Ki Hajar Dewantara's humanistic philosophy, which emphasizes learners' moral, cultural, and social development as central to education (Fitriyani & Parhan, 2024). Ikhwan et al (2025) further note that integrating moral values in classroom practices creates a conducive and harmonious learning environment, shaping students' character while promoting critical thinking, problem-solving, and ethical decision-making. AI-supported curricula, therefore, must balance technological innovation with character formation, ensuring students develop both cognitive and affective skills.

C. AI Literacy & Family Collaboration

AI literacy must be embedded with ethical awareness, critical thinking, and human values (Mazı & Yıldırım, 2025; Tagare et al., 2025; Yue Yim, 2024). Teachers' ethical competencies, including knowledge, skills, and attitudes, are essential to implement AI effectively while maintaining moral orientation (Tagare, 2025). Parental involvement enhances character education, reduces digital risks, and strengthens social-emotional development (Hadi Prabowo et al., 2020). Collaboration among teachers, families, and communities ensures a humanistic and ethical AI learning ecosystem, where AI functions as a facilitator rather than a replacement for human interaction (Permana, Belva, Saskia., Hazizah, Lutvia, Ainun., Herlambang Yusuf, 2024).

D. Philosophical Implications

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Philosophical reflection positions AI as a tool for human empowerment rather than an autonomous educational agent (Lestari et al., 2025; Nurazizah et al., 2024). Human-centered AI emphasizes fairness, inclusion, and transparency (Purwanto, 2025). Philosophical analyses emphasize that AI should enhance human cognitive and moral capacities rather than replace human judgment, aligning technology with the broader aims of ethical education (Karpouzis, 2024). Education must balance technological rationality with moral and spiritual values, ensuring AI supports ethical decision-making, empathy, and social responsibility (Beti Malia Rahma Hidayati, 2024; Desisca et al., 2025; Yuliana et al., 2020). Integrating ethical principles in AI-based education promotes reflective and morally conscious learners capable of navigating complex social and digital environments. This approach aligns with Ki Hajar Dewantara's humanistic philosophy and the broader goals of forming ethically responsible and critically aware students.

E. Methodological Critique

Although the SLR identified key theoretical frameworks, many studies remain conceptual, with limited empirical validation of AI's effects on moral and character development. Quantitative research is sparse, and potential biases such as cultural context, sample limitations, and technological variance affect generalizability. Future research should adopt mixed-method designs to empirically assess cognitive, socio-emotional, and ethical outcomes (Mazı & Yıldırım, 2025; Munandar et al., 2025; Tagare, 2025). While reviewed studies emphasize AI's potential for personalization and efficiency, only a minority investigate its impact on students' moral development, highlighting the need for empirical studies that integrate ethical, humanistic, and value-based outcomes alongside academic performance.

Interpretation: While several reviewed studies emphasize AI's potential for personalization, only a minority empirically investigate its effects on students' moral development. This suggests a disciplinary tilt toward technical optimization rather than value-oriented evaluation, highlighting the need for empirical research that measures socio-emotional outcomes alongside learning performance.

CONCLUSION

Basic education in the era of artificial intelligence (AI) presents both substantial opportunities and fundamental challenges for the educational landscape. The findings of this review indicate that the integration of AI in primary education cannot be separated from philosophical and ethical reflections that place humans at the center of the learning process. While AI has demonstrated its potential to enhance efficiency and personalization in learning, it also poses risks of dehumanizing education when detached from value-based foundations. Therefore, educational philosophy serves as a critical framework to ensure that AI implementation aligns with moral principles, character formation, and the cultivation of humanistic values among students. The future of basic education should maintain equilibrium between technological innovation and ethical development. The integration of philosophical reflection, digital ethics, and humanistic pedagogy ensures that AI operates as an instrument of human empowerment rather than a substitute for it. By grounding education in the values of empathy, morality, and responsibility, schools can foster a generation that is not only intellectually capable but also wise, ethical, and resilient in navigating the complexities of the digital age.

Nevertheless, this review acknowledges several limitations. The restricted five year time window (2020–2025) may have excluded earlier or emerging studies that could contribute broader theoretical or empirical insights. Furthermore, the reliance on English-language publications introduces the possibility of linguistic bias, potentially limiting the inclusivity of global perspectives. The exclusion of grey literature such as policy documents, institutional reports, and unpublished theses also narrows the scope of practical insights regarding AI implementation in education. In light of these limitations, it is recommended that schools and curriculum developers adopt a structured AI Ethics Integration Checklist. This checklist should include the alignment of AI tools with student-centered values, the provision of continuous teacher training in digital ethics, the conduction of regular ethical audits of AI-based platforms, and the engagement of parents and communities in promoting responsible AI literacy. Future researchers are encouraged to employ mixed-method and longitudinal designs to examine how specific AI applications influence students' moral reasoning, empathy, and social

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behavior over time. Comparative and cross-cultural investigations are also needed to explore ethical and contextual variations in AI integration across diverse educational systems.

Theoretically, this review contributes by bridging educational philosophy, ethical frameworks, and humanistic pedagogy within the context of AI-driven primary education. It underscores that technological advancement must be guided by a value-oriented epistemology, redefining innovation as a means to cultivate human dignity rather than as an end in itself. Integrating AI into primary education must therefore be guided by ethical frameworks and pedagogies that prioritize students' moral and social development; future empirical research should evaluate how specific AI interventions affect those outcomes over time.

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