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Stakeholder Attitudes and Inclusive Early Childhood Education for Children with Disabilities in Zimbabwe

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Abstract

Stakeholder attitudes critically determine inclusive education outcomes, shaping whether children with disabilities are welcomed or rejected, supported or neglected. Yet limited research has examined attitude dynamics within early childhood development (ECD) settings in sub-Saharan Africa, where cultural beliefs about disability may generate distinctive attitudinal patterns. This study investigated how stakeholder attitudes affect inclusion of children with disabilities in Zimbabwean ECD centres, examining attitudes across multiple stakeholder groups and the mechanisms through which attitudes translate into inclusion or exclusion. Employing a convergent parallel mixed-methods design, data were collected from 12 school-heads, 36 teachers, and 24 parents of children with disabilities through structured questionnaires and semi-structured interviews. Quantitative data were analysed using chi-square tests; qualitative data underwent thematic analysis within Bronfenbrenner's Ecological Systems Theory framework. Ethical approval was obtained (UNISA/04/17/58561242/13/MC). Findings revealed statistically significant associations between stakeholder attitudes and inclusive education outcomes (school-heads: $\chi^2=64.67$, $p<0.01$; teachers: $\chi^2=64.55$, $p<0.01$). Positive attitudes enhanced inclusion through increased learning opportunities and stakeholder support. Negative attitudes manifested as exclusionary enrolment decisions, discrimination against specific disabilities (epilepsy, hearing impairment), and reduced participation. Parents identified teachers' fears about epilepsy contagion and discomfort with sign language as specific attitudinal barriers. Stakeholder attitudes fundamentally shape inclusive ECD for children with disabilities, operating through complex interactions across ecological systems. Attitudinal change requires multi-level interventions targeting knowledge gaps, cultural beliefs, and systemic support structures. Disability-specific patterns indicate need for targeted interventions addressing particular misconceptions and skill gaps relevant across similar low-resource contexts.

Keywords: Stakeholder attitudes, inclusive education, early childhood development, children with disabilities, Zimbabwe, attitudinal barriers, ecological systems theory, epilepsy stigma

1. Introduction

The success of inclusive education for children with disabilities depends not only on material resources and policy frameworks but fundamentally on the attitudes of stakeholders who implement and experience inclusion (Avramidis et al., 2000; Sharma & Michael, 2017). Attitudes shape whether children with disabilities are welcomed or rejected, supported or neglected, included or excluded. They influence enrolment decisions, classroom practices, peer relationships, and children's own self-concept and motivation. Within early childhood development (ECD), where foundational attitudes toward diversity are formed and children are most vulnerable to exclusion, stakeholder attitudes assume particular significance (Cassady, 2011; Vaz et al., 2015).

Attitudes vary across stakeholder groups (teachers, school leaders, parents, peers, government officials) and across disability types (Nowicki & Sandieson, 2002). Understanding this variation is essential for designing effective interventions, as different groups may require different attitude-change strategies.

Zimbabwe has demonstrated policy commitment to inclusive education through constitutional provisions (Constitution of Zimbabwe, 2013) and educational legislation (Education Act, 1996, Revised 2006). However, previous Zimbabwean research has documented attitudinal barriers to inclusion (Mafa, 2012; Majoko, 2016; Chireshe, 2013). Mafa (2012) found that negative attitudes among teachers, parents, and community members constituted significant barriers. Majoko (2016) identified attitudinal challenges specific to ECD settings. Chireshe (2013) documented that negative attitudes toward disability were prevalent in Zimbabwean society.

Yet limited research has systematically examined attitude dynamics across multiple stakeholder groups within Zimbabwean ECD settings, nor has previous research explored the disability-specific patterns of attitudes

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this study reveals. This study addresses this gap by investigating how attitudes of diverse stakeholders affect inclusion of children with disabilities in Zimbabwean ECD centres. Guided by Bronfenbrenner's Ecological Systems Theory (1979), the research conceptualises attitudes as operating across and interacting between systemic levels. The study addresses the question: *To what extent do stakeholders' attitudes affect the inclusion of children with disabilities in early childhood education in Zimbabwean primary schools?*

2. Literature Review

2.1 Attitude Formation and Disability

Attitudes are relatively enduring evaluations that predispose individuals to respond in particular ways (Eagly & Chaiken, 1993). Attitudes toward disability are socially constructed through cultural beliefs, personal experiences, and institutional practices (Scior, 2011). In many African contexts, disability is attributed to spiritual causes such as witchcraft or divine will, leading to stigmatisation (Chataika et al., 2020). These cultural beliefs operate at the macrosystem level, shaping the context within which individual attitudes form.

Within educational contexts, teacher attitudes are particularly consequential (Avramidis & Norwich, 2002). Teachers who hold positive attitudes toward inclusion are more likely to adapt instruction and create welcoming environments. Teachers with negative attitudes may resist inclusion or transmit negative messages to peers.

2.2 Teacher, Leadership, and Parent Attitudes

International research consistently identifies teacher attitudes as critical for inclusion success. Avramidis et al. (2000) found that teachers with prior experience of disability demonstrated more positive attitudes. Subban and Sharma (2005) reported that teachers' confidence in their ability predicted positive attitudes. Forlin et al. (2009) found that teacher attitudes were influenced by training, experience, support, and workload concerns.

School-head attitudes shape institutional culture and resource allocation (Praisner, 2003). Principals with positive attitudes allocate resources and establish inclusive school cultures. In Zimbabwe, Mafa (2012) found that some school-heads held negative attitudes, viewing children with disabilities as the responsibility of special schools.

Parents of children with disabilities may harbour attitudes that hinder inclusion, including over-protectiveness and fears of discrimination (Engelbrecht et al., 2001). Conversely, parents of non-disabled children may express concerns about curriculum dilution or diverted teacher attention (Norwich, 2002).

2.3 Disability-Specific Attitudinal Patterns

Research documents differential attitudes toward specific disabilities. Epilepsy generates particular stigma due to misconceptions about contagion (Galletti & Sturniolo, 2004). Hearing impairment creates communication barriers that frustrate interaction (Musengi, 2019). Intellectual disability may be associated with low expectations (Siperstein et al., 2007). These differential attitudes affect inclusion because stakeholders respond differently to different disabilities.

2.4 Theoretical Framework

Bronfenbrenner's Ecological Systems Theory (1979) provides the analytical framework. The microsystem includes individual attitudes of teachers, parents, and peers directly affecting children's daily experiences. The mesosystem comprises interactions between microsystem elements. The exosystem encompasses institutional attitudes embedded in policies. The macrosystem consists of cultural beliefs about disability. The chronosystem encompasses changes over time in attitudes. This framework reveals that changing attitudes requires intervention at multiple levels.

3. Method

3.1 Research Design

A convergent parallel mixed-methods design was employed, integrating quantitative survey data with qualitative interview data (Creswell & Clark, 2017).

3.2 Sample and Sampling

Participants included 12 school-heads, 36 teachers, and 24 parents of children with disabilities from ECD centres in Masvingo province, Zimbabwe. Purposive sampling of schools ensured inclusion of schools enrolling children with disabilities. Within selected schools, all teachers working in ECD centres were invited to

participate (census sampling). The sample size was justified by qualitative saturation principles (Guest et al., 2006) and conventions for chi-square analysis requiring expected frequencies >5 in most cells.

3.3 Instruments

Structured questionnaires featured Likert-scale items addressing attitude-related statements. Items were developed based on literature review and piloted with 5 teachers and 2 school-heads from non-participating schools. Cronbach's alpha for the teacher questionnaire was 0.82; for school-head questionnaire, 0.79. Open-ended questionnaire items invited elaboration on quantitative responses. Semi-structured parent interviews explored parents' experiences with stakeholder attitudes.

3.4 Data Analysis

Chi-square tests analysed quantitative response patterns. Assumptions of chi-square (independence of observations, expected frequencies >5 for most cells) were verified. Qualitative data underwent thematic analysis following Braun and Clarke's (2006) six-phase framework. Integration of quantitative and qualitative data occurred during interpretation.

3.5 Ethical Considerations

Ethical protocols included institutional approval from the Zimbabwe Open University Ethics Committee (approval UNISA/04/17/58561242/13/MC) and permission from the Ministry of Primary and Secondary Education (C/426/3 MASVINGO). Participants provided informed consent. Confidentiality was maintained through use of pseudonyms.

4. Findings

4.1 Quantitative Results

Table 1 presents quantitative findings. For school-heads, the observed chi-square value ($\chi^2=64.67$) substantially exceeded the critical value (37.57 at $p<0.01$), indicating significant agreement that attitudes affect inclusion. For teachers, the chi-square value ($\chi^2=64.55$) similarly exceeded the critical value.

Table 1. Stakeholder attitudes affecting inclusion of children with disabilities in ECD

Respondents	Statements	SA (%)	A (%)	U (%)	D (%)	SD (%)	Total	χ^2
School-heads (N=12)	1. Teachers' negative attitudes negatively affect inclusion	41.7	41.0	0	8.3	8.3	12	64.67*
	2. Head-teachers' willingness positively affects inclusion	33.3	58.3	0	8.3	0	12	
	3. Parents' acceptance positively affects inclusion	33.3	41.7	16.7	8.3	0	12	
	4. Inclusion success depends on stakeholders' attitudes	58.3	33.3	0	8.3	0	12	
	5. Negative attitudes negatively affect inclusion	25.0	66.7	0	8.3	0	12	
	6. Lack of knowledge contributes to negative attitudes	58.3	25.0	0	8.3	8.3	12	
	Total	30	32	2	6	2	72	
Teachers (N=36)	1. Attitudes determine success of inclusion	38.9	55.6	0	2.8	2.8	36	64.55*
	2. Negative teacher attitudes are a barrier	44.4	36.1	2.8	13.9	2.8	36	
	3. Successful inclusion depends on stakeholders' attitudes	0	0	5.6	38.9	55.6	36	
	4. Parents' attitudes determine inclusion extent	36.1	50.0	2.8	11.1	0	36	
	5. Head-teachers' attitudes determine inclusion	0	13.9	2.8	27.8	55.6	36	
	6. Positive attitudes influence success	44.4	52.8	0	2.8	0	36	
	Total	59	75	5	35	42	216	

*Note: χ^2 critical value = 37.57 (df=20, $p<0.01$); SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree; $p<0.01$

Key patterns requiring explanation: A notable inconsistency appears in teacher responses. While 94.5% agreed that "attitudes determine the success of inclusion" (Item 1), 94.5% disagreed that "successful inclusion depends on stakeholders' attitudes" (Item 3). This apparent contradiction likely reflects item wording effects rather than actual attitudinal inconsistency. Item 1 uses "determine" while Item 3 uses "depends on" - phrasing that may have been interpreted differently by respondents. Additionally, response fatigue may have affected Item 3, positioned later in the questionnaire.

4.2 Qualitative Findings

Positive attitudes as inclusion facilitators: School-heads articulated how positive attitudes enable inclusion. Head 9 stated: "Positive attitudes by stakeholders affect inclusion positively." Head 6 elaborated: "Positive attitudes motivate learners to learn and parents will provide their children with the necessary resources for inclusion." Head 5 identified opportunity provision as the key mechanism: "With a positive mind-set, disabled children are given opportunities to participate in their learning thereby being included."

Teachers echoed these sentiments. Teacher 33 stated: "If stakeholders have positive attitudes towards children with disabilities then inclusion will work." Teacher 9 used powerful metaphors: "Positive attitudes of stakeholders are the key for better learning of children. Stakeholders are the pillars of inclusive education."

Parents provided vivid accounts of how positive attitudes affected their children. Parent 17 attributed holistic development to head-teacher attitudes: "If head-teachers have positive attitudes they will help the child to develop socially, intellectually and physically." Parent 6 described attitude transmission: "Teachers who accept children with disabilities help other children without disabilities to learn to accept too."

Negative attitudes as inclusion barriers: School-heads described cultural beliefs underpinning negative attitudes. Head 4 stated: "Most people in our culture regard children with disabilities as worthless in society hence affect their inclusion negatively." Head 5 elaborated: "Many in society think that disabled children are useless. Hence they need to be educated... to consider all children equal."

Parents provided the most disturbing accounts. Parent 19 reported: "The head and teachers were negative about including the child saying that my child's signing will affect the learning of other children." Parent 12 described epilepsy-related exclusion: "Teachers at first were accepting but when he fell they sent a message to come and get the child. Teachers feared that they would catch the epilepsy." Parent 6 revealed the specific misconception: "The teacher thought that the other children could also become epileptic if they came into contact with my child's saliva."

Disability-specific patterns: Two disabilities generated particularly negative responses. Epilepsy exclusion was driven by contagion misconceptions. Hearing impairment exclusion was driven by communication barriers, with teachers uncomfortable with sign language and peers jeering at deaf children (Parent 19).

4.3 Integration of Quantitative and Qualitative Findings

The integration of methods reveals three key meta-inferences. First, quantitative consensus (94.5% teacher agreement on attitude importance) is deepened by qualitative mechanisms - attitudes operate through opportunity provision, motivation, and modelling. Second, the head-teacher attitude perception gap (91.6% of heads believing their attitudes matter versus 83.4% of teachers disagreeing) is explained by qualitative data suggesting teachers view their classroom-level autonomy as independent of leadership. Third, disability-specific patterns (epilepsy, hearing impairment) identified qualitatively explain why quantitative responses showed variation despite overall consensus.

5. Discussion

5.1 The Centrality of Attitudes to Inclusion Outcomes

The robust statistical associations between attitudes and inclusion, corroborated by qualitative data, establish stakeholder attitudes as fundamental determinants of inclusive education in ECD settings. The near-unanimous agreement among teachers (94.5% on Item 1) demonstrates the perceived centrality of attitudes. This finding aligns with international literature (Avramidis et al., 2000; Sharma & Michael, 2017) and extends it to Zimbabwean ECD.

The mechanisms through which attitudes affect inclusion are illuminated by qualitative data. Positive attitudes create opportunities for participation, motivation for learning, and modelling of acceptance. Negative

attitudes manifest as exclusionary enrolment decisions, discriminatory responses to specific disabilities, and emotional distress. These mechanisms resonate with Cassady's (2011) observation that attitudes function as "gatekeepers" determining whether inclusive policies translate into inclusive practices.

5.2 The Head-Teacher Attitude Perception Gap

The finding that teachers largely disagree that head-teachers' attitudes determine inclusion (83.4% disagreement) while heads believe their attitudes matter (91.6% agreement) is significant. Teachers may perceive classroom-level autonomy as allowing inclusion implementation regardless of leadership attitudes. Alternatively, teachers may have experienced heads whose positive attitudes did not translate into practical support. Heads may overestimate their influence. This perceptual gap has implications: heads may focus on their own attitude development while neglecting resource provision teachers actually need.

5.3 Cultural and Disability-Specific Dimensions

School-heads' references to cultural beliefs situate negative attitudes within broader cultural contexts, supporting Chataika et al. (2020). Attitude-change interventions must address deep-seated cultural beliefs, not merely knowledge deficits.

Epilepsy generated particularly strong negative responses, with specific misconception that epilepsy spreads through saliva (Parent 6). This aligns with Galletti and Sturniolo (2004) and requires targeted education and seizure management training. Hearing impairment generated exclusion based on communication challenges, aligning with Musengi (2019). The solution requires sign language training, not merely attitude change.

5.4 Parent Attitude Dynamics

Parents' descriptions of their attitudinal journeys - from resistance to acceptance - reveal that parent attitudes evolve through experience and support. This finding suggests professionals should understand that resistance may reflect protectiveness and anxiety requiring empathetic support, rather than judging parents who resist inclusion.

5.5 Theoretical Contributions

This study extends ecological systems theory by demonstrating how attitudes operate across systemic levels. Microsystem attitudes (individual teachers, parents) directly shape children's experiences. Mesosystem interactions (parent-teacher congruence) affect collaboration. Exosystem influences (school-head policies) shape classroom contexts. Macrosystem cultural beliefs establish the broader attitudinal environment. Chronosystem evolution (parent journeys) demonstrates attitude change over time.

Crucially, the finding that teachers perceive autonomy from leadership attitudes suggests microsystem agency within constraining exosystem contexts - a nuance often missing from ecological applications.

5.6 Unexpected Findings

The teacher response inconsistency (Item 1 vs Item 3) was unexpected. While methodological (wording effects, response fatigue) explanations are plausible, this finding also suggests teachers may hold complex, sometimes contradictory attitudes toward inclusion - not uniformly positive or negative but context-dependent.

6. Conclusion

This study demonstrates that stakeholder attitudes fundamentally affect inclusion of children with disabilities in Zimbabwean ECD centres. Positive attitudes facilitate inclusion through enhanced opportunities, motivation, and support. Negative attitudes constitute significant barriers through exclusionary practices, discrimination, and reduced participation. Attitudes operate across multiple stakeholder groups with complex ecological interactions.

The research reveals important nuances: attitudes vary by disability type (epilepsy and hearing impairment generating particularly negative responses); teachers perceive autonomy from leadership attitudes; parents undergo attitudinal journeys from resistance to acceptance; government attitudes expressed through resource allocation signal the value placed on inclusion.

The study contributes to inclusive education scholarship by documenting attitude-inclusion dynamics in an under-researched context, revealing disability-specific patterns requiring targeted intervention, and demonstrating ecological complexity of attitude influences. Future research should develop culturally

appropriate attitude measurement instruments, evaluate attitude-change interventions, and investigate peer attitude formation in ECD settings.

7. Policy Implications

For the Ministry of Primary and Secondary Education: Develop explicit policy provisions addressing attitudinal barriers. Launch national disability awareness campaigns addressing cultural misconceptions. Develop disability-specific training materials (epilepsy, hearing impairment). Mandate basic sign language training for all ECD teachers. Demonstrate governmental attitudinal commitment through visible resource allocation for inclusive education.

For Teacher Training Institutions: Integrate disability studies throughout curricula with emphasis on attitude development through contact with persons with disabilities. Provide in-service professional development addressing attitudinal barriers. Train all teachers in basic sign language, epilepsy management, and inclusive strategies. Ensure teacher educators model positive attitudes.

For School Leadership: School-heads should explicitly communicate commitment to inclusion, modelling positive attitudes through words and actions. Regularly assess stakeholder attitudes. Develop parent engagement programmes supporting parents through their attitudinal journeys. Implement classroom activities promoting positive peer attitudes. Address epilepsy fears through accurate information and seizure management protocols.

For Communities: Establish community dialogue forums addressing disability beliefs. Engage religious leaders in disability awareness. Identify and celebrate positive examples of inclusion. Facilitate parent-to-parent support networks.

References

- Allport, G.W. (1954). *The nature of prejudice*. Addison-Wesley.
- Antonak, R.F., & Livneh, H. (2000). Measurement of attitudes towards persons with disabilities. *Disability and Rehabilitation*, 22(5), 211-224.
- Avramidis, E., Bayliss, P., & Burden, R. (2000). Student teachers' attitudes towards the inclusion of children with special educational needs. *Teaching and Teacher Education*, 16(3), 277-293.
- Avramidis, E., & Norwich, B. (2002). Teachers' attitudes towards integration/inclusion. *European Journal of Special Needs Education*, 17(2), 129-147.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard University Press.
- Cassady, J.M. (2011). Teachers' attitudes toward the inclusion of students with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 41(2), 17-23.
- Chataika, T., Mckenzie, J., & Swart, E. (2020). Community attitudes towards disability in Africa. *African Journal of Disability*, 9, 1-11.
- Chireshe, R. (2013). Barriers to the implementation of inclusive education in Zimbabwe's primary schools. *South African Journal of Education*, 33(2), 1-12.
- Constitution of Zimbabwe Amendment (No. 20) Act, 2013.
- Creswell, J.W., & Clark, V.L.P. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage.
- Eagly, A.H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace.
- Education Act [Chapter 25:04], 1996 (Revised 2006). Government of Zimbabwe.
- Engelbrecht, P., Oswald, M., & Forlin, C. (2001). Parent perspectives on inclusive education in South Africa. *International Journal of Special Education*, 16(2), 45-56.
- Forlin, C., Loreman, T., Sharma, U., & Earle, C. (2009). Demographic differences in changing pre-service teachers' attitudes. *International Journal of Inclusive Education*, 13(2), 195-209.
- Galletti, F., & Sturniolo, M.G. (2004). Children with epilepsy: The teacher's perspective. *Seizure*, 13(1), 23-28.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? *Field Methods*, 18(1), 59-82.
- Mafa, O. (2012). Challenges of implementing inclusive education in Zimbabwe. *Zimbabwe Journal of Educational Research*, 24(1), 15-26.
- Majoko, T. (2016). Inclusion of children with disabilities in Zimbabwean early childhood development centres. *South African Journal of Childhood Education*, 6(1), 1-10.
- Majoko, T. (2021). Teacher preparedness for inclusive education in Zimbabwe. *African Journal of Disability*, 10, 1-9.

- Musengi, M. (2019). The place of sign language in the inclusive education of deaf learners in Zimbabwe amid CRPD (mis)interpretation. *African Disability Rights Yearbook*, 96 – 111. [http:// doi.org/10.29053/2413-7138/2019/v7a5](http://doi.org/10.29053/2413-7138/2019/v7a5)
- Nowicki, E.A., & Sandieson, R. (2002). A meta-analysis of school-age children's attitudes towards persons with disabilities. *International Journal of Disability, Development and Education*, 49(3), 243-265.
- Norwich, B. (2002). *Education, inclusion and individual differences*. University of London.
- Praisner, C.L. (2003). Attitudes of elementary school principals toward inclusion. *Exceptional Children*, 69(2), 135-145.
- Scior, K. (2011). Public awareness, attitudes and beliefs regarding intellectual disability. *Research in Developmental Disabilities*, 32(6), 2164-2182.
- Sharma, U., & Michael, S. (2017). Teacher attitudes toward inclusive education. In J.P. Bakken (Ed.), *General and special education inclusion* (pp. 45-62). Emerald.
- Siperstein, G.N., Parker, R.C., & Bardon, J.N. (2007). A national study of youth attitudes toward inclusion of students with intellectual disabilities. *Exceptional Children*, 73(4), 435-455.
- Subban, P., & Sharma, U. (2005). Primary school teachers' perceptions of inclusive education in Victoria, Australia. *International Journal of Special Education*, 20(1), 1-10.
- Szumski, G., Smogorzewska, J., & Karwowski, M. (2020). Peer attitudes toward inclusion of children with disabilities. *International Journal of Inclusive Education*, 24(1), 20-35.
- Vaz, S., Wilson, N., & Falkmer, M. (2015). Factors associated with primary school teachers' attitudes towards inclusion. *PLoS ONE*, 10(8), 1-15.

Designing the Future: Responsible AI Adoption in Education

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Abstract

Artificial intelligence (AI) is a field of study that combines the applications of machine learning, algorithm productions, and natural language processing. Applications of AI transform the tools of education. AI has a variety of educational applications, such as personalized learning platforms to promote students' learning, automated assessment systems to aid teachers, and facial recognition systems to generate insights about learners' behaviours. Despite the potential benefits of AI to support students' learning experiences and teachers' practices, the ethical and societal drawbacks of these systems are rarely fully considered in K-12 educational contexts. The rapid integration of Artificial Intelligence (AI) into educational systems has transformed teaching, learning, and administrative processes. While AI offers significant opportunities to enhance personalization, accessibility, and efficiency, it also raises ethical, social, and pedagogical concerns. This paper (1) explores the concept of responsible AI adoption in education; (2) briefly defines AI through the concepts of machine learning and algorithms; (3) emphasizing fairness, transparency, accountability, data privacy, and inclusivity; and (4) describes ethical challenges and dilemmas of using AI in education. By examining current applications, challenges, and governance frameworks, the study proposes strategic recommendations for designing an ethical and sustainable AI-driven educational future.

Keywords: Responsible AI, education technology, ethics, artificial intelligence, digital learning

1. Introduction

“Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks.”—Stephen Hawking.

We may not think about artificial intelligence (AI) on a daily basis, but it is all around us, and we have been using it for years. When we are doing a Google search, reading our emails, getting a doctor's appointment, asking for driving directions, or getting movie and music recommendations, we are constantly using the applications of AI and its assistance in our lives. This need for assistance and our dependence on AI systems has become even more apparent during the COVID-19 pandemic. The growing impact and dominance of AI systems reveals itself in healthcare, education, communications, transportation, agriculture, and more. It is almost impossible to live in a modern society without encountering applications powered by AI (Akgun and Greenhow, 2022; Bendici, 2018; Iman et al., 2020).

AI dominates the fields of science, engineering, and technology, but also is present in education through machine-learning systems and algorithm productions (Naqvi, 2020). For instance, AI has a variety of algorithmic applications in education, such as personalized learning systems to promote students' learning, automated assessment systems to support teachers in evaluating what students know, and facial recognition systems to provide insights about learners' behaviours (Remian, 2019).

The ethical challenges of AI in education must be identified and introduced to teachers and students. Responsible AI in education refers to the development and deployment of AI tools that prioritize ethical practices, inclusivity, transparency, and data privacy. By ensuring AI systems align with educational goals while respecting student welfare, educators can harness technology responsibly to foster improved learning experiences.

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2. Literature Review

Research work on Artificial Intelligence (AI) in education has been increasingly giving positive results for its usage to enhance teaching and learning processes. Scholars have examined both the potential benefits of AI-driven educational tools and the ethical challenges associated with their implementation.

Several studies highlight the positive impact of AI on personalized learning. In 2020, Alexandra.Irina.Pinzariu has reviewed in her research “An educational paradigm shift: Technology enhanced adaptive and hybrid education”. There are some questions about whether educational institutions actually shape graduates prepared for practical and ethical engagement with their scholarly, professional, and personal worlds. The overall aim of this research paper is to provide the reader with insights through the review and exploration of various current and emerging new technologies that might be adapted and used in high school education in order to help the development of a better educational system which is aligned with the requirements of the jobs market.

In 2022, Gianni.Fenu et al., reviewed “Experts’ view on challenges and needs for fairness in AI for education.” This paper shows that in recent years, there has been a stimulating discussion on how artificial intelligence (AI) can support the science and engineering of intelligent educational applications. Many studies in the field are proposing actionable data mining pipelines and machine-learning models driven by learning-related data. The potential of these pipelines and models to amplify unfairness for certain categories of students is however receiving increasing attention. If AI applications are to have a positive impact on education, it is crucial that their design considers fairness at every step.

In 2025, Shaouna.Shoaib.Lodhi, Shoaib. Lodhi has worked on review “Integration of AI in STEM Education: Addressing Ethical challenges in K-12 settings. He talked that The rapid integration of Artificial Intelligence (AI) into K-12 STEM education presents transformative opportunities alongside significant ethical challenges. While AI-powered tools such as Intelligent Tutoring Systems (ITS), automated assessments, and predictive analytics enhance personalized learning and operational efficiency, they also risk perpetuating algorithmic bias, eroding student privacy, and exacerbating educational inequities. This paper examines the dual-edged impact of AI in STEM classrooms, analyzing its benefits (e.g., adaptive learning, real-time feedback) and drawbacks (e.g., surveillance risks, pedagogical limitations) through an ethical lens. In the same year ie: 2025, Sara Butt and Farah Fida have reviewed “Artificial Intelligence and the future of Education: Opportunities and challenges”. They argued that rapid advancements in Artificial Intelligence are changing the educational landscape across the globe with it becoming feasible to achieve personalized learning, ease assessment through a competitive atmosphere for students or by reducing the workload of a teacher and increasing administrative efficiency. Prior generations of educational technology did not offer adaptation prediction and auto generation in the way that AI does.

3. Rising Interest in AI in Education

Today, many priorities for improvements to teaching and learning are unmet. Educators seek technology-enhanced approaches addressing these priorities that would be safe, effective, and scalable. Naturally, educators wonder if the rapid advances in technology in everyday lives could help. Educators use AI-powered services in their everyday lives, such as voice assistants at their homes; working mothers are using tools that can correct grammar, complete sentences, and write essays in just fractions of minutes; and automated trip planning on their phones. Many educators are actively exploring AI tools as they are newly released to the public. Educators see opportunities to use AI-powered capabilities like speech recognition to increase the support available to students with disabilities, multilingual learners, and others who could benefit from greater adaptivity and personalization in digital tools for learning. They are exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons.

Educators are also aware of the risks which AI is producing but they know the “*Teachable Moments and Pedagogical Strategies that a human teacher can address but are undetected or misunderstood by AI models*”. Educators know about their responsibility to make learners progressing in a way so that they would learn the fair usage of an AI. The educators are much capable of harnessing to serve the good to educational priorities while taking care of the dangers coming in way as a result of AI being used in edtech.

3.1 Responsible AI adoption in Education

Responsible AI adoption in education refers to the ethical design, development, deployment, and use of artificial intelligence technologies in teaching, learning, and educational administration. It emphasises ensuring that AI systems support educational goals while protecting students’ rights, promoting fairness and maintaining

human oversight. As AI becomes increasingly integrated into educational environments, responsible adoption is essential to prevent the harm and maximise the benefits.

3.2 Emphasizing Fairness, Transparency, Accountability, Data Privacy, and Inclusivity

Responsible adoption requires regular testing, auditing and updating of AI models to reduce discriminatory outcomes and promote inclusive learning environments. AI-driven decisions in education- such as grading, student placement, or learning recommendations- should be transparent and understandable to educators, students, and parents as well. Explainable AI helps the users to understand how the decisions are made, builds trust, and allows the stakeholders to challenge or correct errors when and where necessary.

Educational institutions and AI developers must remain accountable for AI system outcomes. AI should support, not replace, human decision-making. Responsible AI adoption includes secure data storage, informed consent, minimal data collection, and compliance with data protection laws. Students' personal and academic information must be safeguarded against unauthorized access and misuse.

AI tools must be designed to support diverse learners, including the students with disabilities, multilingual learners, and those from underserved communities. Responsible AI aims to reduce educational inequality by improving access to personalized and adaptive learning opportunities.

3.3 Defining AI through the concept of Machine Learning and Algorithms

Machine learning is a key subfield of AI. It allows systems to learn from data and improve their performance over the time without explicit programming (Alpaydin, 2020). In education, machine learning enables adaptive and personalized learning systems by analysing students' learning behaviours, progress, and needs to adjust instructional content accordingly (Holmes et al., 2019).

Algorithms are structured sets of rules and instructions that navigate how the data is processed to achieve specific outcomes (Mitchell, 1997). In regard with educational contexts, algorithms are said to be the patterns which are used to organize learning content, evaluate student performance, and provide the feedback based on the predefined criteria (Zawacki-Richter, et al., 2019).

Together, algorithms and machine learning form the foundation of AI technologies. While algorithms give the access to logical structure, on the other hand, machine learning allows the AI systems to adapt through experience.

3.4 Ethical challenges and dilemmas of using AI in education

One of the most significant ethical challenges of AI is the collection, storage, and usage of student data. AI helps keeping academic data or information, confidential academic reports, inclusive personal information of the students as well as the faculties/ teachers on large datasets. If data protection measures are inadequate, students' privacy may be compromised through data breaches, or misused (UNESCO, 2021). When AI models are trained on historical datasets, they may produce discriminatory outcomes that are disadvantageous for certain groups of students based on race, gender, socioeconomic status, or ability. Such bias raises ethical concerns about fairness and equity in educational terms (O'Neil, 2016). Excessive usage of AI or dependence on AI can decrease the human values as well as human interaction.

4. Application of AI in Education

4.1 Personalized Learning

AI powered learning has provided platforms to each and every learner to check on their abilities, learning pace, and preferences as well. This personalization supports differentiated instruction and helps learners achieve better outcomes.

4.2 Automated Assessment and Feedback

Automated grading systems evaluate quizzes, assignments, and exams efficiently. These systems provide timely feedback to the students and allow the teachers to focus on instructional planning and student support.

4.3 Intelligent Tutoring Systems

AI systems have become all-time favourite by tutoring the learners in a way providing them with answers of the questions, explanation of the concepts, and even the practice exercises. These tools support self-paced learning and academic assistance.

4.4 Administrative Support

AI assists educational institutions with scheduling, attendance tracking, and data management, improving efficiency and reducing administrative burden.

5. Principles of AI in Education

The following principles will give way for Responsible AI in education:

- **Fairness-** Discrimination should not be practiced by AI in education. It should be equal for everyone and everything.
- **Transparency-** This should be the clear mirror in education. Decisions made by AI should be understandable to the educators as well as the students.
- **Accountability-** The responsibility for the AI outcomes must be taken by the institutions.
- **Privacy protection-** Privacy should be kept while using AI for the students' personal records. It should be ethically used.
- **Inclusivity-** AI should support all the learners and reduce educational inequality.

6. Recommendations for Responsible AI Adoption

To make it purposeful, AI in education should be used ethically and responsibly. So that no biasness is practiced in the institutions. The personal data of the students should be kept safely and evaluated timely. To fulfil all the criteria, some recommendations are mentioned below while protecting learners' rights and promoting equitable outcomes.

6.1 Establish Ethical Framework

Educational institutions should develop ethical standards, and make clear and governance policies. Clear governance helps educational institutions to work ethically.

6.2 AI Literacy and Professional Development

Educators and administrators should be literate with AI. Improved knowledge enables educators to evaluate AI tools, and make informed decisions. Research says that the teacher preparedness is essential for ethical adoption in education (Holmes et al., 2019; OECD, 2023).

6.3 Data Privacy and Protection

Student record should be collected, stored, and used very wisely and responsibly. Regular audits should be conducted to ensure compliance with privacy regulations and ethical standards (Williamson and Eynon, 2020).

6.4 Promotion of Transparency

Each and every decision should be clear to the educators as well as the students. Transparency builds trust amongst educators, students, and parents as well and enables users to question or challenge AI outcomes.

6.5 Ensure Inclusivity

AI should ensure education for all learners, including the learners with disabilities, multilingual learners, and those from underserved communities.

6.6 Encourage Student Awareness and Ethical Use

The students should be educated about AI technologies, its benefits, limitations and ethical implications. Promoting AI use and critical thinking help students become informed and ethical users of AI systems.

6.7 Promotion of fairness and reduction of biasness

AI systems in educational institutions must be evaluated timely for bias and discriminatory outcomes. Addressing bias is critical to ensure equity and inclusion in AI supported educational environments (O’Neil, 2016; Zawacki-Richter et al., 2019).

7. Conclusion

Responsible AI ensures the employment of the technological norms in education while used ethically and enhancing education through personalization, efficiency, and accessibility. With thoughtful implementation and strong governance, AI can contribute to a sustainable and ethical future for education. By focussing on fairness, transparency, inclusivity, privacy, and accountability, educational institutions can integrate AI in ways that support human-centred learning. Responsible AI teaches not only how to protect the learners but to build the trust and sustainability in AI-driven educational systems. The ethical challenges and dilemmas related to AI in education highlight the need for responsible and thoughtful adoption. To be responsible AI educator, one should be accurate in utilizing the AI tools with the needed precautions and by not harming anyone’s privacy. AI adoption in education requires a balanced approach that integrates technological innovation with ethical responsibility.

References

- Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics*, 2(3), 431-440.
- Alpaydin, E. (2020). *Introduction to machine learning* (4th ed.). MIT Press.
- Bendici, R. (2018). Rise of the machines. *Univ. Bus*, 21(10), 53-54.
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Iman, M., Arabnia, H. R., & Branchinst, R. M. (2021). Pathways to artificial general intelligence: a brief overview of developments and ethical issues via artificial intelligence, machine learning, deep learning, and data science. *Advances in Artificial Intelligence and Applied Cognitive Computing: Proceedings from ICAI’20 and ACC’20*, 73-87.
- Mitchell, T. M. (1997). *Machine Learning*. Mc Graw-Hill.
- Naqvi, A. (2020). *Artificial intelligence for audit, forensic accounting, and valuation: a strategic perspective*. John Wiley & Sons.
- OECD. (2023). *AI and the future of Education*. OECD Publishing.
- O’Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Crown.
- Remian, D. (2019). *Augmenting education: Ethical considerations for incorporating artificial intelligence in education (Unpublished master’s thesis) Boston: University of Massachusetts*.
- UNESCO. (2021). *Ethics of artificial intelligence in education*. UNESCO.
- Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology*, 45(3), 223-235.
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational technology in Higher Education*, 16(91), 1-27.

Leading Through Uncertainty: Inclusive and Ethical Postdigital Leadership for AI-Enabled Higher Education

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Abstract

Global education is being reshaped by converging disruptions, including climate pressures, geopolitical uncertainty, and rapid advances in generative artificial intelligence, aligned with international agendas for sustainable and inclusive development. These dynamics are transforming higher education into complex, datafied, and platformised ecosystems that are not only technological but also epistemic and ethical. This paper advances a conceptual leadership framework for AI-enabled higher education, grounded in postdigital and sociomaterial perspectives. It introduces an extended conceptual leadership framework for inclusive and ethical AI integration in higher education – the “Three Cs” leadership framework: Care, Curiosity, and Challenge – reinterpreted through the lens of human–AI co-agency and responsible AI governance, grounded in postdigital and sociomaterial perspectives. The Three Cs are presented as a model for navigating complexity and ensuring equity, accessibility, and human-centred values in AI-enabled environments. By integrating theoretical insights with practical implications, the framework offers guidance for inclusive and ethical AI implementation and helps bridge the gap between technological adoption and leadership practice. The contribution of this chapter is primarily conceptual, normative, and position-based, rather than empirically grounded.

Keywords: AI Governance, Digital Transformation, Education, Ethics, Glocalisation, Human–AI Co-agency, Human Flourishing, Inclusion, Leadership, Sustainability, Scalability

1. Introduction

Education is a human right and a driving force for sustainable development and peace (United Nations, 1948). This is affirmed in the UN UNESCO 2030 Agenda for sustainable and inclusive development (UNESCO, 2016). Every goal in the 2030 Agenda relies on education to empower people with the knowledge, skills, and values needed to live with dignity, build their lives, and contribute to their societies. Global education is being reshaped in line with the UNESCO 2030 Agenda for sustainable and inclusive development (UNESCO, 2016), as well as by converging disruptions, including climate pressures, demographic changes, geopolitical uncertainty, and rapid advances in digital transformation (Newman, McGill, & Knight, 2025) and development (Schwab, 2017; UNESCO, 2023a UNESCO, 2024d UNESCO 2025b), including generative artificial intelligence (AI), which is advancing faster than our capacity to govern it ethically. Higher education is undergoing a profound transformation driven by a convergence of global disruptions, including climate change, geopolitical instability, and the rapid evolution of artificial intelligence (AI). These developments align closely with international agendas promoted by UNESCO (2021a), the European Commission, (2021, 2023), the OECD (2023a, 2023b), the World Bank (2025), Schleicher A. (2020), the World Economic Forum (2024 2025 2026), and UNESCO, the International Labour Organization, and the World Bank (2025), who emphasise sustainability, inclusion, and lifelong learning as central to the future of education. The increasing adoption of generative and agentic AI systems in teaching, learning, and institutional decision-making introduces both unprecedented opportunities and significant risks. AI has the potential to enhance personalised learning, expand access, and improve institutional efficiency. However, it also raises critical ethical concerns, including algorithmic bias, inequitable access, data surveillance, and the erosion of human autonomy (Bozkurt et al., 2020; Floridi & Cowls, 2019; Selwyn, 2024). These tensions highlight a growing disconnect between the pace of technological innovation and the development of leadership frameworks capable of guiding such transformation responsibly. AI is reshaping teaching, learning, and governance while raising ethical concerns such as bias, inequity, and loss of human agency (European Commission, 2021, 2023; Floridi & Cowls, 2019; Selwyn, 2024; UNESCO, 2021). However, the integration of AI into higher education is not merely a technological shift; it represents a deeper epistemic and structural transformation that changes how knowledge is produced, shared, and evaluated.

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UNESCO's Education for Sustainable Development initiative identifies five pillars of education: learning to know, learning to do, learning to live together, learning to be, and learning to transform oneself and society. In its follow-up the Sustainable Development Goals Report 2025 (UNESCO, 2025) notes that, although progress is being made, it remains far too slow. The report finds that, while millions of lives have improved through advances in health, education, energy, and digital access, the pace of change is still insufficient to fully achieve the SDGs by 2030. Only 18% of SDGs are on track, with another 17% showing moderate progress. Nearly half are progressing too slowly, and close to a fifth are regressing in a volatile environment marked by conflict, climate change, geopolitical tension, and economic instability.

These global challenges and dynamics are transforming education, including higher education, into complex, datafied, and platformised ecosystems that are not only technological but also epistemic, human, and ethical. This transformation requires new leadership paradigms capable of navigating complexity, uncertainty, and socio-technical change, with governance that is adaptive, ethically grounded, and anticipatory. Globally, new questions are emerging for educational systems as AI – particularly GenAI – increasingly influences people's lives. As Marchick (2026), Dean of the Kogod School of Business at American University, states:

AI is going to change everything – how we work, how we learn, how we interact. It will not replace human talent, but those who understand AI will have a clear advantage. Our responsibility is to ensure every graduate is AI fluent, regardless of discipline.

The World Economic Forum (2026) states that the world of work is changing rapidly, and developing future-ready work models will be necessary to channel this change into the creation of stronger labour markets and adequate safeguards. In this Outlook from May 2026, they indicate that, despite limited evidence of immediate AI-driven labour disruption, organisations are prioritising structural workforce adaptation. The main challenge is no longer a shortage of talent, but a mismatch of skills. This is driving greater focus on job redesign, large-scale reskilling, and responsible AI deployment. Together, these shifts signal a move from reactive to proactive talent management, towards system-level workforce transformation. Thus, they are asking: AI is going to redesign work as we know it – are organisations ready?

In education, we must therefore ask ourselves the crucial ethical question: What should teachers teach and what should learners learn – for individuals, for the planet, and for the SDGs? This also requires brave, innovative leaders with the courage to lead through uncertainty with an agile and resilient approach. Furthermore, there is a greater need than ever to encourage and focus on humans and human flourishing, as humans are the only resources we can truly rely on. That is why human flourishing is crucial in our educational systems and ecosystems.

1.1 Purpose of the study

This study presents a conceptual leadership framework to support inclusive, ethical, and context-sensitive implementation of artificial intelligence in higher education. It examines how leadership can ensure that AI enhances, rather than undermines, equity, accessibility, and human-centred values. The paper's contribution is primarily conceptual, normative, and position-based, rather than empirically grounded. It introduces a theoretically integrated leadership framework that combines postdigital and sociomaterial perspectives with responsible AI governance, viewing education as a socio-technical assemblage shaped by both human and non-human agency, where humans and AI act as co-agents. The study addresses a critical gap between technological adoption and ethical leadership in AI-mediated education. It responds to the growing influence of generative and agentic AI in pedagogy, assessment, and institutional decision-making, while considering associated risks such as algorithmic bias, erosion of academic integrity, and challenges to human autonomy. The framework specifically focuses on inclusion and equity within responsible AI governance, addressing the gap between technological adoption and ethical leadership in AI-mediated education. It examines the increasing influence of generative and agentic AI in pedagogy, assessment, and institutional governance, while addressing risks such as algorithmic bias, erosion of academic integrity, and challenges to human autonomy. The paper advances leadership as responsible AI governance, human flourishing, and ethical stewardship, emphasising responsibility, transparency, and systemic reflexivity in AI-mediated environments. Rather than relying on empirical data, the study synthesises interdisciplinary research and professional practice to offer a forward-looking conceptual contribution. By operationalising the Leadership through Uncertainty framework, built on the “three Cs” (Care, Curiosity, Challenge) and through the lens of human–AI co-agency, it offers a scalable, glocalised framework that bridges policy, practice, and theory for sustainable and inclusive transformation in higher education.

The structure of this paper is as follows. After this brief introduction (1), the research questions and method are presented (2), followed by an overview of the conceptual framework and the paradigm shift in global education, including the role of open education for a better world and the implementation of UNESCO's Agenda 2030 with its SDG4—Quality Education for All, Leaving No One Behind. The discussion then turns to AI in education, its opportunities and challenges as well as human flourishing (3). AI in ethical leadership and the

existing gaps are examined next (4). The paper then explores the three Cs for ethical leadership and the journey through uncertainty towards sustainable, scalable, and inclusive education with care, curiosity, and challenge in the age of AI. This section also addresses the key challenges of AI in an ever-changing learning environment from a critical and forward-looking perspective (5), before discussing the prospects of AI in education and leadership as we move towards inclusive, ethical, and transformative

2. Method

A desktop research design was used to synthesise existing knowledge efficiently and transparently McCombes S. (2023). Secondary data from peer-reviewed journals, policy documents, industry reports, and credible grey literature published in the past five years were systematically analysed. Searches using key terms such as ethical leadership, sustainability, paradigm shift in global education, leading through uncertainty, and AI in education were conducted across major academic databases. Thematic analysis identified recurring patterns related to ethics, openness, sustainability, and AI, ensuring a comprehensive and credible understanding of leadership during times of uncertainty.

3. Findings

Postdigital and sociomaterial perspectives view education as socio-technical assemblages in which agency is distributed across human and non-human actors (Grint, 2005; Jandrić et al., 2018; Orlikowski, 2007). The postdigital perspective recognises that digital technologies are embedded within social and cultural systems, rather than functioning as external tools (Jandrić et al., 2018). Sociomateriality further emphasises that agency is distributed across human and non-human actors, including algorithms, platforms, and data infrastructures (Orlikowski, 2007). In this context, leadership must be understood as operating within socio-technical assemblages, requiring adaptive, relational, and ethically grounded approaches.

Below, AI in higher education is briefly summarised, followed by human flourishing as components of the conceptual framework.

3.1 AI in higher education

The OECD Digital Education Outlook 2023 (OECD, 2023a) examines the transformative potential of artificial intelligence in education systems. The report was developed in partnership with Education International, which represents teacher unions, to ensure that the adoption of new technologies aligns with pedagogical goals and teacher professionalism. It notes that, although digital tools have traditionally been adopted slowly, the advent of generative AI (GenAI) is prompting education systems to move from basic digitisation towards genuine digital transformation. Key findings and themes from the 2023 report include:

- From Digitisation to Transformation: Education systems must move beyond simply using technology (digitisation) to redesigning learning experiences, school management, and student assessment through AI.
- The Promise of Personalisation: AI offers significant potential for personalising education, providing tailored feedback to students, and supporting teachers to improve the quality and equity of learning.
- Need for Governance and Ethics: The rapid development of AI requires clear ethical guidelines and safeguards to protect student data privacy, avoid algorithmic bias, and prevent the reinforcement of existing social inequalities.
- Human-in-the-Loop: AI should complement, not replace, human judgement in education. Teachers remain central to the process, and AI should support their work rather than diminish it.
- AI Literacy as a Core Skill: The report emphasises that education systems must prepare students for a future in which they work alongside AI by fostering AI literacy and relevant skills.

Their key recommendations for policymakers are that education systems should:

- Develop coherent AI strategies: Integrate AI into national digital strategies, moving away from fragmented, ad hoc, or prohibited implementations.
- Invest in digital infrastructure: Ensure equitable access to high-quality digital resources to prevent worsening the digital divide.
- Empower educators: Provide teachers with professional development opportunities to understand, use, and evaluate AI systems, enabling them to be active participants in digital transformation rather than passive users.

According to UNESCO, Artificial Intelligence (AI) has the potential to address some of the greatest challenges in education today, innovate teaching and learning practices, and accelerate progress towards SDG 4 (Miao, Holmes & Ronghuai, 2021). UNESCO's mandate inherently calls for a human-centred approach to AI. It aims to shift the conversation to include AI's role in addressing current inequalities in access to knowledge, research, and the diversity of cultural expressions, and to ensure AI does not widen technological divides within and between countries.

The promise of "AI for all" is that everyone can benefit from the ongoing technological revolution and access its outcomes, particularly in innovation and knowledge (Bozkurt et al., 2023a, 2023b; Hambrock et al., 2025; Ossiannilsson et al., 2024; Open Education Global, 2024). However, rapid technological developments inevitably bring multiple risks and challenges, which have so far outpaced policy debates and regulatory frameworks. UNESCO emphasises that policies and strategies for using AI, as well as those from the OECD (2024), are essential to maximise its benefits and mitigate potential risks. It further argues that developing AI-ready policy-makers is the first step in the policy development process. UNESCO provides guidance to policy-makers on understanding AI and addressing the challenges and opportunities it presents in education. It focuses on the importance of introducing the fundamentals of AI, including its definition, techniques, technologies, capabilities, and limitations. Furthermore, it outlines emerging practices and benefit-risk assessments for leveraging AI to enhance education and learning, promote inclusion and equity, and highlights the reciprocal role of education in preparing people to live and work with AI.

To foster the readiness of education policy-makers in artificial intelligence, UNESCO has developed the frameworks for Artificial Intelligence and Education: Guidance for Policy-makers (Miao, F., Holmes, W., & Ronghuai, H., 2021), which aim to generate a shared understanding of the opportunities and challenges that AI presents for education, as well as its implications for the core competencies needed in the AI era. In addition, to guide countries in supporting students and teachers to understand both the potential and risks of AI, UNESCO has published the AI competency frameworks for students and teachers (UNESCO, 2024a, updated 2025; UNESCO, 2024b; UNESCO, 2024c). AI is distinct from other digital technologies because of its potential to profoundly reshape societies, economies, and education systems. Unlike conventional information and communication technologies (ICTs), AI presents unique ethical and social challenges, including issues of fairness, transparency, privacy, and accountability. Furthermore, AI's ability to mimic human behaviour directly affects human agency. These challenges require dedicated competencies beyond traditional digital literacy. While UNESCO has provided guidance on digital competencies for many years, the new AI competency frameworks address the specific nuances of AI. They emphasise a human-centred approach to AI education, promoting critical thinking, ethical considerations, and responsible use of AI technologies.

Zawacki-Richter et al. (2019) argue that AI technologies are increasingly influencing higher education. In line with both the OECD and UNESCO, Zawacki-Richter et al. (2019) and Williamson and Eynon (2020) state that AI enables personalisation and scalability but introduces risks such as algorithmic bias, inequity, and surveillance. Selwyn (2024) also highlights that opportunities include personalised learning and scalability, while risks include bias, inequity, and threats to academic integrity. However, AI systems may reinforce structural inequalities unless leaders prioritise inclusion, accessibility, and fairness in their implementation.

3.2 Human flourishing

In recent years, the OECD has worked extensively worldwide and has now released the framework Education for Human Flourishing. The next generation must be prepared to design and build the participative democracies and regenerative economies of the future. Education for Human Flourishing sets out new directions, particularly for primary and secondary education, to help young people flourish in life and work, and to contribute to the flourishing of themselves, their communities, societies, and the planet (planetism). However, it can also be applied to higher education. Three principles guide this initiative:

- Enabling young people to design new societal, economic, and organisational models for a century of unprecedented challenge.
- Developing their cognitive, creative, and caring capabilities.
- Helping them find purpose and meaning through learning.

Education for Human Flourishing develops five competencies: adaptive problem-solving, ethical competency and understanding, interpreting the world, appreciating the world, and acting in the world (see Figure 1). Each is rigorous and challenging, can be taught and assessed, and builds on mathematics, science, reading, and digital literacy. Education for Human Flourishing represents a major shift in the purpose, content, and methods of education, preparing the next generation for their future rather than our past. Maintaining the status quo will waste young people's talents, further harm their mental health, and fail to address the urgent challenges of our time. Marking a significant transformation in education, the framework promotes human meaning, agency, and security in the era of AI (OECD, 2025).

Figure 2 - Education for human flourishing architecture

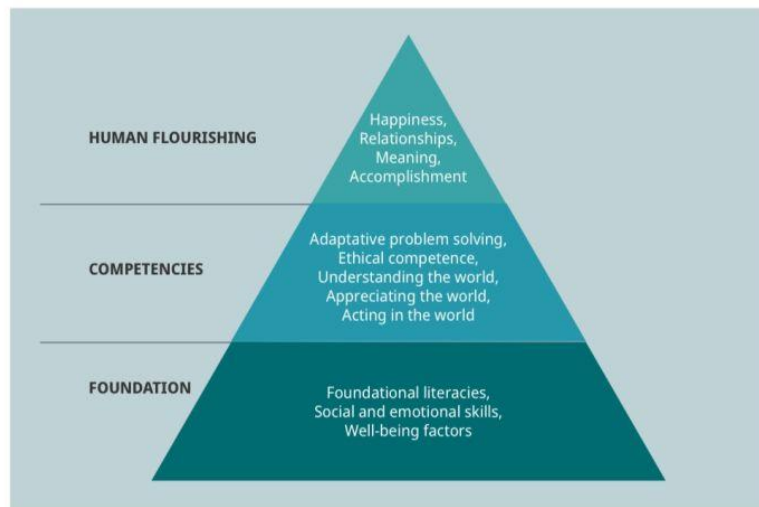


Figure 1. Education for Human Flourishing: A New Vision for Education Systems (OECD, 2025)

There are ten main takeaways from this framework:

- The ultimate purpose of education is flourishing, not just performance.
- Flourishing combines happiness, meaning, and social connection.
- Competencies such as ethical judgement, cultural intelligence, and adaptive problem-solving bridge learning and life.
- Foundational literacies remain vital, as do social and emotional skills.
- Ethical competence and empathy are now essential for future readiness.
- Adaptability is the new literacy.
- Flourishing is relational, not individualistic.
- Wellbeing is both a means and an end of learning.
- We need to measure what truly matters: belonging, purpose, and trust.

Schools are not merely teaching institutions; they are architects of human flourishing. This framework aligns with efforts to reimagine education around wellbeing, cultural competencies, ethical practices, and purpose, particularly in faith-based schools where community remains central to learning.

The next section will address leadership, as these new frameworks involving AI in education for all and human flourishing highlight the need to address leadership gaps, leadership for transformation, and the critical issues concerning the type of courage required to lead change at scale while ensuring that no student, teacher, or institution is left behind.

3.2 Leadership gap

Leadership frameworks have not kept pace with emerging technological change, such as developments in AI. Existing approaches often neglect ethical, socio-technical integration, and inclusive dimensions (Biesta, 2010; Fullan, 2001; Stratton-Maher, Ossiannilsson, 2024; Ossiannilsson, Manousou, and Arumugam (2026). This creates a gap in addressing not only AI-related challenges but also human flourishing and agency. Addressing this gap requires a reconceptualisation of leadership that integrates ethical, epistemic, and socio-technical dimensions (Karakose, Tülübaş, Papadakis, 2023). AI systems risk reinforcing structural inequities unless leadership explicitly prioritises inclusion, equity, accessibility, marginalised learners, diversity, and fairness in their design and implementation. At the same time, governance and leadership, strategy and ethics, and innovation and responsibilities should be addressed not as opposing parameters, but as part of the ecosystem and system change (ICDE, 2022, 2024a, 2024b, 2025; Ossiannilsson, 2025; Stratton-Maher, Ossiannilsson, Manousou, and Arumugam, 2026).

In the next section, the proposed Three Cs framework and leadership during uncertainty are explored.

3.3 The Three Cs framework

The main contribution of this paper is the theoretically grounded extension of the “Three Cs” leadership framework (Stratton-Maher, Ossiannilsson, Manousou, and Arumugam, 2026). The core principles of the Three Cs framework are inclusivity, scalability, and sustainability, which are inherently multifaceted (Ossiannilsson, 2025). Inclusivity is defined as a universal yet personalised approach that ensures equitable access, respect, and opportunity for all learners and staff. It values diversity without reducing individuals to their characteristics, emphasising co-creation with students to design supportive digital and physical environments that foster engagement, critical thinking, and openness. Scalability refers to the capacity to expand learning and support systems dynamically while maintaining quality and accessibility. It relies on agile, interoperable, and ethical digital infrastructures, flexible pedagogical design, and institutional alignment to ensure consistent, high-quality experiences across diverse contexts. Sustainability involves building adaptable and ethical educational ecosystems that balance environmental, technological, economic, and human needs. It promotes eco-conscious digital practices, well-being, and resilience, while embedding the UN Sustainable Development Goals (UNESCO, 2016) to ensure higher education remains socially responsible, resource-efficient, and future-oriented amid ongoing global change.

The “Three Cs” leadership framework introduces an expanded conceptual approach to inclusive and ethical AI integration in higher education: Care, Curiosity, and Challenge, reinterpreted through the lenses of human–AI co-agency, human flourishing, future-oriented leadership, and responsible AI governance, grounded in postdigital and sociomaterial perspectives. The Three Cs framework is presented as a model for navigating complexity and ensuring equity, accessibility, and human-centred values in AI-enabled environments. It offers a scalable, glocalised model that connects policy, practice, and theory for sustainable and inclusive transformation in higher education. By integrating theoretical insights with practical implications, the framework provides guidance for inclusive and ethical AI implementation and supports bridging the gap between technological adoption and leadership practice.

Care emphasises ethical stewardship and highlights ethical responsibility, human flourishing, relational trust, inclusion, responsible AI governance, and well-being. Curiosity fosters critical AI literacy, epistemic resilience, and reflexivity. Challenge and transformative agency drive innovation, accountability, institutional courage, and systemic change. Together, these dimensions form a holistic leadership model, offering a scalable and adaptable approach for leading amid uncertainty towards sustainable digital futures. Aligned with Sustainable Development Goals 4 (quality education) and 17 (partnerships), the paper presents a glocalised leadership framework that bridges global policy and local practice. It contributes to ongoing debates by articulating how leadership can shape equitable, human-centred, and sustainable AI-enabled education systems. The study provides practical and conceptual insights for researchers, policymakers, and institutional leaders working to ensure that AI enhances, rather than diminishes, equity, agency, and human-centred values in education (see Figure 2).

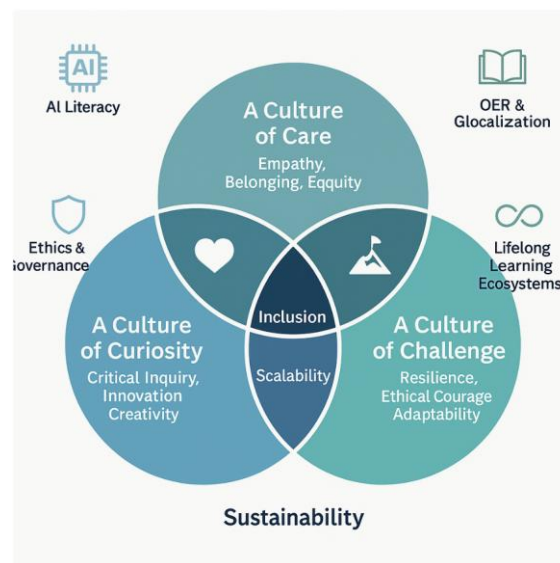


Figure 2. Postdigital Leadership Framework: the three Cs framework for AI-enabled higher education

This framework is a conceptual, theory-building contribution that addresses the gap between AI adoption and leadership theory. It is neither descriptive nor speculative, but is analytically positioned. The figure is structured around three intersecting domains: Care, Curiosity, and Challenge. The outer layer focuses on human–AI co-agency, ethics and governance, lifelong learning ecosystems, OER, and glocalisation. The output layer includes Inclusion, Scalability, and Sustainability. This framework addresses the urgent need for ethical, adaptive leadership in AI-enabled higher education. It positions leadership as a response to postdigital conditions characterised by human–AI co-agency, datafication, and socio-technical complexity.

The framework encompasses the outcomes of inclusion, scalability, and sustainability across higher education ecosystems. It aligns with SDG 4 (Quality Education), SDG 17 (Partnerships), glocalisation, and human flourishing in education. The framework explicitly states that leadership is no longer about control, but about navigating uncertainty and shaping ethical, human-centred futures in AI-mediated education. It operates within human–AI co-agency, recognising ethical, adaptive, and inclusive transformation, and shared agency between humans and technologies. Six key themes can be identified:

- AI Transformation and Digital Opportunity
- People-centred, values-driven leadership
- Proactive shaping of change
- Challenges beyond technology
- The Power of collaboration and shared leadership
- Care and ethical stewardship

4. Discussion and Conclusion

This paper addresses the emerging need to conceptualise leadership beyond techno-solutionist narratives in AI-enabled education. It argues that leadership should be redefined as an ethical, relational, and adaptive practice capable of navigating uncertainty and complexity. To meet this need, the paper proposes a conceptual framework based on three interrelated dimensions – Care, Curiosity, and Challenge – designed to support inclusive and ethical AI integration in higher education.

The framework incorporates UNESCO SDG4 (UNESCO, 2016), education for human flourishing (OECD, 2026), ethics, technology, lifelong learning, well-being, and leadership (Ossiannilsson, 2025), and provides a scalable model for inclusive AI transformation (EU, xxxx; OECD, xxxx; UNESCO, xxxx; WEF, xxxx). By adopting the three Cs framework, leaders can implement Care through ethical AI policies and inclusive design; Curiosity through AI literacy programmes, staff development, and capacity building; and Challenge by leading with agile methods through uncertainty, and, at a practical level, reforming assessment, addressing inequities, and embracing well-being, human flourishing, diversity, and inclusion.

The main practical implications are that leaders must implement ethical AI governance, institutions must ensure equitable access, and policymakers must support inclusive regulation. All levels must be involved to secure the qualities embedded in the ecosystem through a holistic approach. For leaders, this means developing ethical AI governance and promoting inclusive and accessible AI practices; for institutions, implementing AI literacy programmes and ensuring equitable access to AI tools; and for policymakers, supporting inclusive AI regulation and promoting global-local collaboration.

There is no doubt that AI will transform higher education, but leadership determines how this transformation unfolds and whether it follows an ethical, human, and inclusive path. All official authorities, such as the European Commission (2021, 2023), OECD (2023a, 2023b), UNESCO, and the World Economic Forum (2024, 2025, 2026), as well as academic scholars, emphasise the human aspect of AI use and implementation. The three Cs framework presented here offers a model for inclusive, human, and ethical leadership that supports human flourishing in AI-enabled higher education. Its implementation advances a theoretically grounded and operationalisable model for ethical and equitable leadership in AI-mediated higher education during times of uncertainty.

This study responds to the emerging need to conceptualise leadership beyond techno-solutionist narratives in AI-enabled education, supporting inclusive, ethical, and sustainable AI integration in higher education. It addresses the gap between technological adoption and leadership theory in AI-mediated higher education.

The paper presents a leadership framework to support inclusive, scalable, sustainable, ethical, and context-sensitive implementation of AI in higher education. It reframes leadership in higher education as an ethical and relational practice within human–AI systems, operationalised through Care, Curiosity, and Challenge as a scalable model for navigating postdigital uncertainty. This is a leadership model for ethically navigating AI in complex and uncertain educational systems. The issue is no longer whether AI will transform education, but whether leadership will shape that transformation ethically. It is crucial that education remains human-centred, inclusive, scalable, sustainable, and future-ready. However, we must recognise that this future began yesterday,

and the actions, considerations, and values we choose today will shape the future we want for individuals and for the planet.

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References

- Biesta, G.J.J. (2010). *Good Education in an Age of Measurement: Ethics, Politics, Democracy* (1st ed.). Routledge. <https://doi.org/10.4324/9781315634319>
- Bozkurt A, Jung I, Xiao J, Vladimirschi V, Schuwer R, Egorov G, et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1):1-126. DOI: 10.5281/zenodo.3878572.
- Bozkurt A, Xiao J, Lambert S, Pazurek A, Crompton H, Koseoglu S, et al. (2023a). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. *Asian Journal of Distance Education*, 18(1). <https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/709>
- Bozkurt A, Gjelsvik T, Adam T, Asino TI, Atenas J, Bali M, et al. (2023b). Openness in education as a praxis: From individual testimonials to collective voices. *Open Praxis*, 15(2):76-112.
- Bozkurt A, Jung I, Xiao J, Vladimirschi V, Schuwer R, Egorov G, et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1):1-126. DOI: 10.5281/zenodo.3878572
- European Commission. (2021). *Digital Education Action Plan 2021-2027*. Brussels: European Commission.
- European Commission. (2023). *Ethical Guidelines for Trustworthy AI*. Brussels: European Commission.
- European Leadership. (2025). Leadership E. Without 5.0 leadership strategy, progress with AI is dubious. LinkedIn. <https://www.linkedin.com/pulse/without-50-leadership-strategy-progress-ai-dubious-v8tke/>
- Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI. *Harvard Data Science Review*.
- Fullan, M. (2001). *Leading in a culture of change*. Jossey-Bass.
- Grint K. (2005). Problems, problems, problems: The social construction of leadership. *Human Relations; Studies Towards the Integration of the Social Sciences*. 58(11):1467-1494
- Hambrock H, Powers R, Ferreira-Meyers K, Abd Karim RR, Ossiannilsson E, Ştefan I. (2025). *Artificial Intelligence for Seamless Learning*. Power Learning Solutions.
- ICDE. (2022). *Leadership for the Future of Online Education*. Oslo: ICDE
- ICDE. (2024a). *Leadership Summit 2024: Navigating the Future of Higher Education with Artificial Intelligence*. Oslo: ICDE.
- ICDE.(2024b). *Technology and Innovation Network (TIN)*. Oslo: ICDE. <https://www.icde.org/icde-technology-and-innovation-network/>
- ICDE. (2025). ICDE Strategy Plan 2025-2028. Oslo: ICDE. <https://www.icde.org/icde-strategy-2025-2028/>
- Jandrić, P., Knox, J., Besley, T., Ryberg, T., Suoranta, J., & Hayes, S. (2018). Postdigital science and education. *Educational Philosophy and Theory*, 50(10), 893–899
<https://doi.org/10.1080/00131857.2018.1454000>
- Karakose T, Tülübaşı T, Papadakis S. (2023). The scientific evolution of social justice leadership in education: Structural and longitudinal analysis of the existing knowledge base, 2003-2022. *Frontiers in Education*, 8:1139648. DOI: 10.3389/educ.2023.1139648
- Marchik, D. (2026, April 21 Blogpost). Universities urged to prepare students for AI-driven economy. The E-Gleaner. (https://jamaica-gleaner.com/article/news/20260421/universities-urged-prepare-students-ai-driven-economy?utm_medium=social&utm_source=linkedin).
- McCombes S. (2023). *How to write a literature review | guide, examples, & templates*. Scribbr. [revised 2025]. <https://www.scribbr.com/methodology/literature-review/>
- Miao, F., Holmes, W., & Ronghuai, H. (2021). *Artificial intelligence and Education: Guidance for policy-makers*. Paris: UNESCO. [Artificial Intelligence and Education: Guidance for Policy-makers](https://unesco.org/en/publications/artificial-intelligence-and-education-guidance-for-policy-makers),
- Newman T, McGill L, Knight S. (2025). *How to Approach Digital Transformation in Higher Education: Findings from Jisc's Digital Transformation Research Pilot*. Jisc: Bristol. <https://www.jisc.ac.uk/reports/how-to-approach-digital-transformation-in-higher-education> [Accessed: May 7, 2025]
- OECD. (2023a). *Digital Education Outlook 2023*.

- OECD. (2023b). *AI in Learning and Education: The Road Ahead*. Paris: OECD.
- OECD (2025). *Education for human flourishing: A conceptual framework*, OECD Publishing, Paris, <https://doi.org/10.1787/73d7cb96-en>.
- Open Education Global. (2024). AI and Open Educational Resources: Opportunities and Challenges. *Open Education Global*.
- Ossiannilsson E, Ulloa Cazarez RL, Goode C, Mansour C, Gomes M, de Gusmão C. (2024). Artificial intelligence use to empower the implementation of OER and the UNESCO OER recommendation. *Open Praxis*, 16(2):237-257
- Ossiannilsson E. (2024). On the verge of a system transformation and the ecosystem of open education. *Education@ETMA*, 3(2):Article 4
- Ossiannilsson, E. (2025). Leadership, Openness, Ethics, and AI: Navigating Uncertainty in Education. In *Sustainable Development. IntechOpen*. <https://doi.org/10.5772/intechopen.1014075>
- Orlikowski, W. (2007). Sociomaterial practices. *Organization Studies*.
- Risse M. (2023). *Political Theory of the Digital Age: Where Artificial Intelligence Might Take us*. Cambridge: Cambridge University Press.
- Roberge A. (2021). *What Will Education Be Like in Twenty Years?* Cursus.edu. <https://cursus.edu/en/23400/what-will-education-be-like-in-twenty-years>
- Schleicher A. (2020). *The Future of Education and Skills: Education 2030*. Paris: OECD.
- Schwab K. (2017). *The Fourth Industrial Revolution*. Geneva: World Economic Forum.
- Selwyn N. (2024). On the limits of artificial intelligence (AI) in education. *Nordisk tidsskrift for pedagogikk og kritikk: Special Issue on Artificial Intelligence in Education*. 10:3-14. DOI: 10.23865/ntpk.v9.6062
- Stratton-Maher, D., Ossiannilsson, E., Manousou, E., and Arumugam, P. (2026). Leading through Uncertainty: The Three Cs Approach to Inclusive, Scalable and Sustainable Leadership in Higher Education. In A. Cossham, B. Carr & C. Goode (Eds.), *30th ICDE World Conference 10 to 13 November 2025, Wellington, New Zealand: Full papers* (pp. 742-763). International Council for Open and Distance Education.
- United Nation. (1948). *Universal Declaration of Human Rights*. New York: UN. <https://www.un.org/en/about-us/universal-declaration-of-human-rights>
- UNESCO. (2016a). *Transforming our World: The 2030 Agenda for Sustainable Development*. Paris: UNESCO. <https://sdgs.un.org/2030agenda>
- UNESCO. (2016b). *The Sustainable development goals report 2016*. <https://unesdoc.unesco.org/ark:/48223/pf0000246526>
- UNESCO. (2021a). *Reimagining our futures together: A new social contract for education*. UNESCO. <https://doi.org/10.54675/ASRB4722>
- UNESCO. (2021b). *Global AI Ethics and Governance Observatory*. Paris: UNESCO. <https://www.unesco.org/ethics-ai/es>
- UNESCO. (2021c). *Ethics of Artificial Intelligence. The Recommendation*. Paris: UNESCO. <https://www.unesco.org/en/artificial-intelligence/recommendation-ethics>
- UNESCO. (2022). *Recommendation on the Ethics of Artificial Intelligence*. Paris: UNESCO. Available from: <https://unesdoc.unesco.org/ark:/48223/pf0000381137>
- UNESCO. (2023a). *Technology in Education: A Tool on Whose Terms?* Paris: UNESCO. <https://www.unesco.org/gem-report/en/publication/technology>
- UNESCO. (2023b). *AI and Education: Guidance for Policy-Makers*. Paris: UNESCO.
- UNESCO, International Labour Organization, World Bank. (2023). *Transforming Technical and Vocational Education and Training for Successful and Just Transitions*. Paris: UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000383360>
- UNESCO. (3 September 2024a updated 20Febr 2025). *What you need to know about UNESCO's new AI competency frameworks for students and teachers*. *AI competency frameworks for students and teachers*. <https://www.unesco.org/en/articles/what-you-need-know-about-unescos-new-ai-competency-frameworks-students-and-teachers?hub=195885>
- UNESCO. (2024b). *AI competency framework for teachers*. Paris: UNESCO. <https://www.unesco.org/en/articles/ai-competency-framework-teachers>
- UNESCO. (2024c). *AI competency framework for students*. Paris: UNESCO. <https://doi.org/10.54675/JKJB9835>
- UNESCO. (2024d). *Digital Learning and Transformation of Education: Open Digital Learning Opportunities for all*. Paris: UNESCO. Available from: <https://www.unesco.org/en/digital-education>
- UNESCO (2025a) The Sustainable Development Goals Report 2025 (<https://unstats.un.org/sdgs/report/2025/>)
- UNESCO. (2025b). *UNESCO Spotlights How Digital Learning Can Promote Equity in Low-Resource Contexts*. Paris: UNESCO. <https://www.unesco.org/en/articles/unesco-spotlights-how-digital-learning-can-promote-equity-low-resource-contexts>

- Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology*, 45(3), 223–235.
<https://doi.org/10.1080/17439884.2020.1798995>
- World Economic Forum. (2024). AI and the Future of Work in Education. Geneva: World Economic Forum.
- World Economic Forum. (2025). AI, tech and the intelligent age at Davos 2025: What to know
<https://www.weforum.org/stories/2025/01/industries-in-the-intelligent-age-ai-tech-theme-davos-2025>
- World Economic Forum. (2026). The future of work
<https://intelligence.weforum.org/topics/a1Gb000000LJQ4EAO>
- World Bank. (2025). *Digital Progress and Trends Report 2025*. Washington, DC: World Bank.
<https://www.worldbank.org/en/publication/dptr2025-ai-foundations>
- Zawacki-Richter, O., et al. (2019). AI in higher education. *International Journal of Educational Technology*.