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Building Digital Equity through Curriculum Development: Navigating AI, Ethics, and Critical Thinking in the Age of Information

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Abstract

This study explores how curriculum development can be leveraged to advance digital equity in education by integrating artificial intelligence (AI), ethical reasoning, and critical thinking. The objective is to examine how inclusive, student-centered, and problem-based learning strategies can prepare both educators and students to navigate the evolving digital landscape responsibly and effectively. Using a qualitative research design, data were collected through semi-structured interviews with faculty members across diverse educational settings. The adapted Faculty's Information and Communication Technology Access (FICTA) instrument was employed to assess faculty readiness and engagement with AI tools across four dimensions: access, skills, usage, and motivation. Thematic analysis of the data revealed key barriers—such as institutional constraints and digital skill gaps—as well as enablers like professional curiosity and peer collaboration. The findings demonstrate the need for targeted professional development, equitable infrastructure, and clear policy guidance. The chapter concludes that curriculum development is a powerful lever for fostering digital equity and that empowering educators is essential to building inclusive, future-ready learning environments. These insights have wide-ranging implications for educational policy, institutional planning, and the ethical integration of emerging technologies in teaching and learning.

Keywords: Digital Equity, AI Education, Critical Thinking, Ethical Decision-Making, Curriculum Development

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INTRODUCTION

In the digital age, equitable access to technology and the skills to use it effectively are no longer optional—they are essential. As artificial intelligence (AI), data-driven systems, and digital platforms increasingly shape how we learn, work, and interact, the concept of digital equity has emerged as a critical educational and societal priority. This chapter explores how curriculum development can serve as a powerful tool to bridge the digital divide, promote ethical engagement with technology, and cultivate critical thinking skills among learners.

The digital divide is a measure of the gap and inequalities in access and use of the digital medium [1]. In educational contexts, designing learning environments needs to be inclusive, adaptive, and responsive to the diverse needs of students and educators alike. And preparing learners is not about just using technology, but to question it, examine its implications, and apply it responsibly. This is reflected is prioritizing and fostering critical thinking skils to examine assumptions, assess values, evaluate evidence, and develop reasoning to help improve decision-making [2].

This chapter focuses on integrating AI education, ethical decision-making, and critical thinking into curriculum design, particularly through student-centered and problem-based learning approaches [3]. These pedagogical strategies not only enhance academic

achievement but also empower students to become informed digital citizens capable of navigating complex information ecosystems. Digital citizenship encompasses competencies, including critical thinking, ethical decision-making, and privacy protection, which help individuals engage with AI technologies in a manner that upholds societal values and personal integrity [3]. By aligning with the United Nations Sustainable Development Goals [4], this work contributes to a global vision of inclusive, equitable, and quality education for all.

Through a combination of research, practical frameworks, and adapted assessment tools such as the Faculty's Information and Communication Technology Access [4] instrument, this chapter provides a roadmap for educators, institutions, and policymakers to foster digital equity. The analysis of this data aims to highlight the importance of faculty readiness, institutional support, and collaborative innovation in shaping a future where technology enhances—not hinders—educational opportunity and social inclusion

Background to the Study

In a world where digital technologies play an increasingly influential role, this chapter seeks to bridge the digital equity gap by implementing online curriculum strategies tailored to students' needs. Digital equity ensures fairness in digital resource allocation and use, promoting equal opportunities for all individuals [5]. Student-centered and problem-based learning enhance academic achievement, making it essential to foster digital literacy through adaptive online curricula [6]. By addressing ethical concerns, integrating AI education, and focusing on critical thinking skills, students will become responsible digital citizens who can navigate the ever-evolving digital landscape effectively and equitably [7]. This chapter aligns with the United Nations Sustainable Development Goals, contributing to a more inclusive and empowered digital future for all [8]. This chapter aims to explore ways to align digital education with real-world needs, ensuring that both students and educators are prepared to navigate the evolving digital landscape effectively.

The evolution of communication technologies has consistently reshaped how societies learn, connect, and progress. From Gutenberg's printing press to the digital age, each technological leap has redefined access to knowledge and the skills required to engage with it. This trajectory illustrates how media revolutions have historically influenced educational paradigms and social equity. In the 21st century, this transformation is being accelerated by artificial intelligence, which is not merely a tool but a new medium of thought and interaction [9]. Artificial intelligence (AI) is defined as the automation of cognition—the ability of machines to perform tasks that typically require human intelligence. [10]

The assertion that "the medium is the message" is particularly relevant in the context of AI.[11] The tools we use to communicate and learn are not neutral—they shape cognition, behavior, and societal structures. As AI becomes embedded in educational environments, it challenges traditional notions of literacy, authority, and critical engagement. A potential future where machines would exceed human intelligence, prompts urgent questions about how humans will coexist with, and learn alongside, intelligent systems.[12]

This shift demands a rethinking of curriculum development. Generative AI is not like a calculator—it doesn't just compute; it collaborates, creates, and converses. This fundamentally alters the learner's relationship with knowledge and necessitates new pedagogical approaches that emphasize critical thinking, ethical reasoning, and digital fluency.[13]

Historically, the rise of technical literacy during the industrial era required educational systems to adapt to the demands of mechanized labor. Today, we face a similar inflection point. The grammar of the machine has evolved into the logic of algorithms, and with it, the imperative to ensure that all learners—not just the privileged few—can access, understand, and shape the digital world.[14]

Digital equity which refers to the fair distribution of digital resources, opportunities, and competencies, ensuring that no individual or group is disadvantaged in the digital realm due to socioeconomic, geographic, or institutional barriers. [15] Digital equity is not simply about access to devices or internet connectivity but about cultivating the capacity to engage meaningfully with digital tools, question their outputs, and use them to solve real-world problems. Curriculum development, therefore, becomes a critical lever for fostering inclusive, ethical, and future-ready education systems.

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Definition of Key Terms

Curriculum Development: The process of planning and organizing the content, structure, and delivery of educational programs to meet learning objectives.

Ethical Reasoning: The process of determining whether an action is right or wrong using a consistent and logical approach.

Critical Thinking: The ability to analyze facts to form a judgment, involving evaluation of sources, such as data, facts, observable phenomena, and research findings.

Artificial Intelligence (AI): The simulation of human intelligence processes by machines, especially computer systems, including learning, reasoning, and self-correction.

Digital Equity: The fair distribution of digital resources, opportunities, and competencies, ensuring that no individual or group is disadvantaged in the digital realm due to socioeconomic, geographic, or institutional barriers.

Significance

The focus on digital equity and curriculum development is of the importance in today's rapidly evolving digital landscape. As digital technologies become embedded in nearly every facet of life—from education and employment to civic participation, healthcare, and governance—ensuring equitable access to these tools is not merely a matter of convenience or efficiency, but a fundamental issue of social justice and human rights. Digital equity ensures that all learners, regardless of socioeconomic status, geographic location, race, gender, disability, or institutional affiliation, have access to engage meaningfully with technology and the digital world.

This chapter addresses the persistent and multifaceted disparities in access to digital technologies, particularly among historically underserved and marginalized communities. These disparities extend beyond the availability of hardware or internet connectivity. They include gaps in digital literacy, confidence in using technology, exposure to advanced tools like artificial intelligence, and the ability to critically evaluate and ethically engage with digital content.[16] Digital Literacy - The ability to efficiently and accurately use digital information technologies and the information retrieved from them [17].Without intentional and systemic efforts to close these gaps, educational systems risk reinforcing existing inequalities and excluding large segments of the population from the benefits of digital transformation.

Artificial intelligence adds a new layer of complexity and urgency to this challenge of digital inequity in education. While AI holds tremendous potential to personalize learning, streamline administrative tasks, and enhance educational outcomes, it also introduces significant ethical dilemmas, algorithmic biases, and risks of misuse. The integration of AI into curricula must therefore be accompanied by a parallel emphasis on critical thinking, ethical reasoning, and digital literacy. Students must not only learn how to use AI tools but also understand their limitations, question their outputs, and consider their broader societal implications. This is especially important in an era where misinformation, surveillance, and automated decision-making are increasingly shaping public discourse and individual opportunity.

This research contributes to a growing body of work that views curriculum development as a strategic lever for promoting digital equity. By embedding AI education and ethical inquiry into learning experiences, educators can empower students to become not just consumers of technology, but informed, reflective, and responsible digital citizens. This approach fosters a generation of learners who are equipped to navigate the complexities of the digital age with agency, empathy, and critical awareness.

Moreover, the significance of this work extends beyond the classroom. It calls for systemic change—collaboration among educators, policymakers, technologists, and community stakeholders—to create inclusive digital ecosystems that support lifelong learning and social mobility. It also highlights the need for sustained investment in professional development and institutional capacity-building. Educators are often expected to adapt to technological change without adequate training, time, or resources. Supporting them in this transition is essential for ensuring that innovations in education are equitable, ethical, and effective.

Finally, this chapter emphasizes that digital equity is not a static goal but a dynamic and evolving process. It requires continuous reflection, innovation, and commitment to justice. As technologies advance and societal needs shift, so too must our educational frameworks, ensuring that all learners are equipped not only to survive but to thrive in a digital world that is as complex as it is promising.

Research Questions

As digital technologies continue to reshape the educational landscape, curriculum developers and educators are increasingly called upon to design learning experiences that not only incorporate emerging tools like artificial intelligence but also foster the critical thinking and digital literacy skills necessary for students to thrive in a complex, information-rich world. [1] This chapter is guided by four central research questions that address the intersection of curriculum development, digital equity, and AI integration. These questions serve as a framework for understanding both the opportunities and the challenges of preparing learners for the demands of the digital age.

1. How can curriculum developers effectively integrate digital literacy and critical thinking skills into course content to promote student success in the information age?
2. What challenges do educators face in implementing responsive curriculum development?
3. What support systems can be put in place to overcome these challenges?
4. How can the integration of AI education into the curriculum enhance students' adaptation of advanced technologies and their societal impact?

The integration of digital literacy, critical thinking, and AI education into curriculum development is not a peripheral concern—it is central to the mission of

equitable, future-ready education. Moving forward, the focus must be on building sustainable, inclusive systems that support educators in this work and ensure that all students—regardless of background—have the opportunity to thrive in a digitally mediated world. [18]
This requires a collective effort: curriculum developers must design with equity in mind; institutions must provide the infrastructure and support; and educators must be empowered as innovators and facilitators of critical inquiry. Only through such coordinated action can we bridge the digital divide and cultivate a generation of learners who are not only digitally competent but also ethically grounded and critically engaged.[19]

LITERATURE REVIEW

Measuring Digital Equity and AI among Faculty

Examining faculty readiness to integrate artificial intelligence [1] into curriculum design is essential for advancing digital equity in education. The Faculty's Information and Communication Technology Access [5] instrument, developed by Soomro et al., provides a robust framework for assessing faculty engagement with digital technologies. Originally designed to evaluate general ICT access and use, the FICTA instrument can be effectively adapted to explore faculty interaction with AI tools in teaching and learning environments.
The FICTA framework is structured around four key dimensions:

- **Physical Access**: This dimension evaluates the availability of essential digital infrastructure, including access to computers, mobile devices, internet connectivity, and AI-enabled platforms. In the context of AI, this includes access to generative AI tools such as ChatGPT, Gemini, or CoPilot, which are increasingly being used for content creation, instructional design, and student engagement.
- **Skills**: This dimension assesses faculty members' technical proficiency and confidence in using digital tools. When applied to AI, it includes the ability to craft effective prompts, interpret AI-generated content, and integrate AI outputs into pedagogical practices. It also encompasses the ability to critically assess the reliability and ethical implications of AI-generated information.
- **Usage**: This dimension captures the frequency and diversity of digital technology use in professional activities. For AI, this includes how often faculty use AI tools for lesson planning, grading, communication, research, and student support. It also considers the extent to which AI is embedded in instructional strategies and classroom interactions.
- **Motivation**: This dimension explores both intrinsic and extrinsic factors that influence faculty engagement with technology. Intrinsic motivation may stem from curiosity, innovation, or a desire for professional growth, while extrinsic motivation may be driven by institutional expectations, peer influence, or student demand. Understanding these motivational drivers is critical for designing effective professional development and support systems.

Adapting FICTA for AI Integration

By tailoring the FICTA instrument to focus specifically on AI, institutions can gain valuable insights into faculty readiness, barriers to adoption, and areas requiring targeted support. For example, questions can be modified to assess comfort with AI prompt engineering, perceptions of AI's role in enhancing student learning, and concerns about data privacy or academic integrity.
This adapted version of FICTA [5] enables institutions to:

- Quantify faculty engagement with AI tools across disciplines and teaching contexts.
- Identify gaps in access, training, or institutional support that may hinder effective AI integration.
- Inform the design of professional development programs that build AI literacy and pedagogical innovation.
- Support strategic planning and resource allocation to promote equitable and sustainable AI adoption.

Ultimately, the use of an AI-adapted FICTA instrument contributes to a broader understanding of how digital equity can be advanced through faculty empowerment. It positions educators not only as users of technology but as co-creators of inclusive, forward-thinking learning environments. This chapter contributes to the growing discourse on AI in education by emphasizing the importance of faculty agency, institutional readiness, and the ethical integration of emerging technologies in pursuit of equitable learning outcomes.

Context, Setting, and Population

The setting of this chapter is within the broader context of global efforts to address digital inequities in education, particularly as they relate to the integration of artificial intelligence [20], ethical reasoning, and critical thinking into curriculum design. The setting spans a diverse range of educational environments, including K–12 schools, higher education institutions, and online learning platforms. These settings reflect the varied landscapes in which digital equity challenges evident — ranging from urban schools with advanced technological infrastructure to rural or underserved communities with limited access to digital tools and connectivity. [21]
The primary population of interest focuses on educators with consideration for the students they serve. A spectrum of considerations are included: socio-economic backgrounds, geographic locations, and levels of digital access and literacy. This diversity is essential to

understanding how digital equity—or the lack thereof—affects learning outcomes, engagement, and long-term opportunities in a technology-driven world.

These educators are faculty members and curriculum developers, who serve as the architects of educational experiences. Their ability to integrate AI tools, foster ethical awareness, and promote critical thinking is central to the success of any digital equity initiative. These educators face a range of challenges [[22]], from institutional constraints and policy limitations to gaps in their own digital competencies. As such, this chapter also explores faculty readiness and motivation, using tools like the adapted Faculty's Information and Communication Technology Access instrument to assess their engagement with AI in teaching. By focusing on these populations within varied educational contexts, this chapter aims to illuminate the systemic and human factors that influence digital equity. It provides a foundation for developing responsive, inclusive curricula that not only bridge the digital divide but also prepare learners and educators to thrive in an increasingly complex and interconnected digital society.[23]

METHODOLOGY

Data Collection and Analysis

This chapter investigates the current state of digital literacy and the integration of artificial intelligence [1] in education through a qualitative research design grounded in faculty perspectives. The study is guided by four research questions:

1. How can curriculum developers effectively integrate digital literacy and critical thinking skills into course content to promote student success in the information age?
2. What challenges do educators face in implementing responsive curriculum development?
3. What support systems can be put in place to overcome these challenges?
4. How can the integration of AI education into the curriculum enhance students' adaptation of advanced technologies and their societal impact?

To explore these questions, data were collected through semi-structured interviews with faculty members across various educational institutions. The interview protocol was developed using an adapted version of the Faculty's Information and Communication Technology Access [5] instrument, which was modified to focus specifically on AI-related competencies and experiences. The adapted FICTA framework provided a structured lens for examining four key dimensions of faculty engagement with AI:

- **Access**: Availability of AI tools and platforms, institutional support, and infrastructure.
- **Skills**: Faculty proficiency in using AI tools for instructional and research purposes.
- **Usage**: Frequency and diversity of AI applications in teaching, curriculum design, and student engagement.
- **Motivation**: Internal and external drivers influencing faculty adoption of AI technologies.

Interview questions were designed to elicit rich, narrative responses that captured both the practical realities and reflective insights of educators. Participants were encouraged to share their experiences, challenges, and aspirations related to AI integration, with particular attention to how these tools influence their ability to foster critical thinking among students.

This qualitative approach allowed for the identification of nuanced barriers—such as institutional policy constraints, time limitations, and ethical concerns—as well as enablers, including professional curiosity, peer collaboration, and student demand. The data also revealed patterns in how faculty are adapting their pedagogical strategies, rethinking their roles, and navigating the evolving expectations of digital-age teaching.

By grounding the inquiry in the adapted FICTA framework, this study not only captures the current landscape of AI use in education but also provides actionable insights for institutions seeking to support faculty in developing equitable, innovative, and future-ready curricula.

The data analysis in this study was grounded in a qualitative framework, using the adapted Faculty's Information and Communication Technology Access (FICTA) instrument to structure and interpret faculty responses. Semi-structured interviews were coded according to four key dimensions—access, skills, usage, and motivation—allowing for a nuanced understanding of how educators engage with AI tools in their teaching practice. This thematic analysis revealed patterns of both barriers and enablers, such as institutional constraints, ethical concerns, and professional curiosity. By systematically examining these themes, the analysis illuminated the real-world challenges educators face and the conditions that support successful AI integration. These insights directly informed the study's findings, highlighting the need for targeted professional development, equitable infrastructure, and clear policy guidance. Ultimately, the analysis provided a robust foundation for the chapter's implications, emphasizing the importance of faculty empowerment and institutional readiness in advancing digital equity through curriculum development.

FINDINGS

This section presents key findings from faculty experiences with integrating artificial intelligence [1] into curriculum design, particularly as a tool to foster critical thinking and digital literacy. The findings are organized to

directly address the four guiding research questions of this study.

1. How can curriculum developers effectively integrate digital literacy and critical thinking skills into course content to promote student success in the information age?

Faculty reported that AI tools offer unique opportunities to embed digital literacy and critical thinking into learning experiences. Educators who actively use AI in their teaching describe how these tools can:

- Encourage students to evaluate the credibility and bias of AI-generated content, fostering critical analysis.
- Support inquiry-based learning by prompting students to ask better questions and refine their thinking.
- Enable real-time feedback and content generation, which students can critique and improve upon.
- Serve as a springboard for ethical discussions around data privacy, authorship, and algorithmic bias.

These practices suggest that curriculum developers can integrate AI not just as a technological enhancement, but as a pedagogical catalyst for deeper learning and reflection.

2. What challenges do educators face in implementing responsive curriculum development?

Despite the promise of AI, faculty face several barriers that hinder responsive curriculum innovation:

- **Institutional constraints**: Policies often restrict access to certain AI platforms due to concerns over data security and academic integrity, limiting experimentation.
- **Time limitations**: Faculty cite a lack of time to explore, learn, and integrate new tools into their teaching, especially given existing workloads.
- **Ethical uncertainty**: Concerns about student data privacy and the transparency of AI outputs create hesitation around full adoption.
- **Digital skill gaps**: Not all educators feel confident using AI tools, particularly those unfamiliar with prompt engineering or digital content evaluation.

These challenges highlight the need for institutional clarity, protected time for innovation, and targeted professional development.

3. What support systems can be put in place to overcome these challenges?

Faculty emphasized the importance of systemic support to enable meaningful AI integration. Key recommendations include:

- **Professional development**: Ongoing training in AI literacy, digital pedagogy, and ethical technology use is essential to build faculty confidence and competence.
- **Collaborative learning environments**: Peer mentoring, interdisciplinary design teams, and communities of practice help educators share strategies and troubleshoot challenges.
- **Infrastructure and access**: Equitable access to AI tools, reliable internet, and technical support must be ensured for both faculty and students.
- **Policy guidance**: Clear institutional frameworks around acceptable AI use, data protection, and academic integrity provide the confidence needed to innovate responsibly.

These support systems are critical for scaling responsive curriculum development and ensuring that innovation is inclusive and sustainable.

4. How can the integration of AI education into the curriculum enhance students' adaptation of advanced technologies and their societal impact?

Faculty observed that students who engage with AI tools in the classroom develop not only technical fluency but also a more critical and reflective stance toward technology. AI integration enhances student learning by:

- **Demystifying AI**: Students gain hands-on experience with AI platforms, learning how they function and how to use them effectively.
- **Fostering ethical awareness**: Classroom discussions around AI-generated content naturally lead to conversations about bias, misinformation, and responsible use.
- **Promoting adaptability**: Students become more comfortable navigating digital tools, preparing them for a rapidly evolving workforce.
- **Encouraging innovation**: By experimenting with AI in creative tasks, students learn to think beyond consumption and toward co-creation and problem-solving.

These findings suggest that AI education, when thoughtfully integrated, can empower students to become informed, ethical, and adaptable participants in a technology-driven society.

CONCLUSIONS

The significance of building digital equity through curriculum development—particularly by integrating artificial intelligence [5], ethics, and critical thinking—cannot be overstated in our increasingly interconnected and technologically advanced world [24]. As digital technologies continue to shape how we learn, communicate, and participate in society, the imperative to ensure equitable access to these tools becomes not only

a pedagogical concern but a moral and civic responsibility.

Digital equity is more than just providing devices or internet access; it encompasses the ability to use digital tools meaningfully, critically, and ethically. In this context, curriculum development becomes a powerful lever for change.[[25]] By embedding digital literacy, ethical reasoning, and AI fluency into learning experiences, educators can equip students with the skills they need to navigate a complex digital landscape—one marked by rapid innovation, information overload, and growing concerns about misinformation, surveillance, and algorithmic bias.

This chapter has shown that student-centered and problem-based learning approaches are particularly effective in promoting these competencies [[2]]. These pedagogies not only enhance academic achievement but also foster deeper engagement, creativity, and reflective thinking. When paired with AI tools, they offer new possibilities for personalized learning, collaborative inquiry, and real-time feedback—while also raising important questions about the role of technology in shaping knowledge and power.

Importantly, this work aligns with the United Nations Sustainable Development Goals [[4]], particularly those focused on quality education, reduced inequalities, and innovation. By addressing the multifaceted challenges of digital equity, this chapter contributes to a broader vision of inclusive, empowered, and future-ready education systems. This chapter asserts that curriculum and teaching strategies developed in the 20th century model will not adequately foster the flexible, well-rounded skills humans need to think critically in a thriving AI-driven world [[26]].

Looking ahead, the focus must be on sustaining this momentum through institutional commitment, cross-sector collaboration, and continuous professional development. Educators must be supported not only in acquiring technical skills but also in cultivating the critical and ethical sensibilities needed to guide students through the digital age. [[27] , [28]] Policymakers and educational leaders must prioritize equity in technology adoption, ensuring that innovation does not exacerbate existing disparities but instead becomes a force for inclusion and empowerment. [29]

Ultimately, this chapter calls for a reimagining of curriculum as a dynamic, responsive, and justice-oriented practice—one that prepares students not just to succeed in a digital world, but to shape it with integrity, empathy, and purpose. [[30]]

REFERENCES

Abbasi BN, Wu Y, Luo Z. Exploring the impact of artificial intelligence on curriculum development in global higher education institutions. Education and Information Technologies. 2024;1-35.

Abbass H. What is artificial intelligence? IEEE Transactions on Artificial Intelligence. 2021 Aug 26;2(2):94-5.

Bailey LE, Nyabola N. Digital equity as an enabling platform for equality and inclusion. Pathfinders for Peaceful, Just, and Inclusive Societies/NYU Center on International Cooperation. 2021; June 2021. Available from: https://cic.nyu.edu/resources/digital-equityas-an-enabling-platform-for-equality-and-inclusion.

Bara G, Xhomara N. The effect of student-centered teaching and problem-based learning on academic achievement in science. Journal of Turkish Science Education. 2020;17[16]:180-198.

Calzada I. Emerging digital citizenship regimes: Pandemic, algorithmic, liquid, metropolitan, and stateless citizenships. Citizenship Studies. 2023;27[16]:160-188.

Clark S, MacLachlan M, Marshall K, Morahan N, Carroll C, Hand K, O'Sullivan K. Including digital connection in the United Nations sustainable development goals: A systems thinking approach for achieving the SDGs. Sustainability. 2022;14[17]:1883.

George AS. Preparing students for an AI-driven world: Rethinking curriculum and pedagogy in the age of artificial intelligence. Partners Universal Innovative Research Publication. 2023;1[16]:112-136.

Gitadewi AJ. Optimizing Digital Literacy Through Problem-Based Learning Models to Improve Student's Critical Thinking Skills. International Journal of Current Educational Research. 2024;3[16]:110-123.

Gottschalk F, Weise C. Digital equity and inclusion in education: An overview of practice and policy in OECD countries. OECD Education Working Papers. 2023:0_1-75.

Hargittai E. The digital divide and what to do about it. New economy handbook. 2003; 821-839.

Khreisat MN, Khilani D, Rusho MA, Karkkulainen EA, Tabuena AC, Uberas AD. Ethical implications of AI integration in educational decision making: Systematic review. Educational Administration: Theory and Practice. 2024;30:8521-8527.

Kovarik B. Revolutions in communication: Media history from Gutenberg to the digital age. Bloomsbury Publishing USA. 2015.

Kurzweil R. The age of spiritual machines: When computers exceed human intelligence. Penguin. 2000.
Lai ER. Critical thinking: A literature review. Pearson's Research Reports. 2011 Jun;6(1):40-1.

Lodge JM, Yang S, Furze L, Dawson P. It's not like a calculator, so what is the relationship between learners and generative artificial intelligence? Learning: Research and Practice. 2023;117-124.

McLuhan M. The medium is the message [20]. In Crime and media. Routledge. 2019;20-31.

Memon FN, Memon SN. Digital Divide and Equity in Education: Bridging Gaps to Ensure Inclusive Learning. In Impact of Digitalization on Education and Social Sustainability. IGI Global. 2025;107-130.

Opesemowo O. Artificial Intelligence in Education, Bridging Community Gap: A Phenomenological Approach. International Journal of New Education. 2024 Dec 9(14).

Ravshanovna KL. Digital technologies in higher education in the 21st century: transforming learning and teaching. Modern problems in education and their scientific solutions. 2025;107-111.

Riel J, Christian S, Hinson B. Charting digital literacy: A framework for information technology and digital skills education in the community college. Available at SSRN 2781161. 2012.

Soomro KA, Kale U, Curtis R, Akcaoglu M, Bernstein M. Development of an instrument to measure Faculty's information and communication technology access. Education and information technologies. 2018;23:253-269.
Stevens E. The grammar of the machine: Technical literacy and early industrial expansion in the United States. Yale University Press. 1995.

UNESCO. Education for Sustainable Development Goals Learning Objectives. Paris: UNESCO. 2017. Available from: https://unesdoc.unesco.org/ark:/48223/pf0000247444.

Walter Y. Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. International Journal of Educational Technology in Higher Education. 2024;21:15.

Williamson JE. Digital equity in schools: An overview of current trends. International Journal of Cyber Ethics in Education. 2011;1[22]:12-24.

Wu JY, Tsai CC. Harnessing the power of promising technologies to transform science education: prospects and challenges to promote adaptive epistemic beliefs in science learning. International Journal of Science Education. 2022;44:346-353.

Wu Y. Critical Thinking Pedagogics Design in an Era of ChatGPT and Other AI Tools—Shifting From Teaching "What" to Teaching "Why" and "How". Journal of Education and Development. 2024;8:1.

Yadav DS. Navigating The Landscape Of Ai Integration In Education: Opportunities, Challenges, And Ethical Considerations For Harnessing The Potential Of Artificial Intelligence [24] For Teaching And Learning. BSSS Journal of Computer. 2024:38-48.

For access to the empirical data that supports the findings presented in Section 8, please refer to the supplementary report available at: https://doi.org/10.5281/zenodo.1234567. This report includes anonymized interview transcripts, coding frameworks, and thematic analysis matrices used in this study.

[1] Gottschalk, & Weise, 2023
[2] Lai, 2011
[3] Hargitai, 2003
[4] Soomro et al., 2018
[5] Suleimenov, 2022
[6] Calzada, 2023
[7] Bara et al, 2022
[8] UNESCO, 2017
[9] Kovarik (2015)
[10] Abbass, 2021
[11] McLuhan (2019)
[12] Kurzweil (2000)
[13] Lodge et al. (2023)
[14] Stevens (1995)

[15] Riel et al., 2012
[16] Yadav et al., 2024
[17] see Appendix A
[18] Clark et al., 2022
[19] Abbasi et al., 2024
[20] Bailey et al., 2021
[21] Memon et al., 2025
[22] Gitadewi et al., 2024
[23] Ravshanovna, 2025
[24] Walter, 2023
[25] Williamson, 2011
[26] George 2023
[27] Wu 2024
[28] Khreisat 2024
[29] Opesemowo, 2024
[30] Wu et al. 2022

Appendix A - Adapted FICTA

The adapted FICTA is designed to assess various aspects of individuals' engagement with artificial intelligence (AI) platforms, focusing on accessibility, motivation, skills, and instructional applications. By evaluating responses to the questionnaire, researchers and educators can identify areas for improvement and develop targeted interventions to enhance AI integration and digital equity in educational settings.

Physical Access – Generative AI Platforms	Frequency: 1-not at all – 5 all the time
1. Chat GPT	
2. Meta AI	
3. Gemini	
4. Claude AI	
5. Jasper AI	
6. CoPilot	
7. Notion AI	
8. Bard	
9. Bing	
10. Other	
External Motivational Access	Agreement: 1-strongly disagree – 5 strongly agree
11. Using AI provide me with information that would lead to better decisions.	
12. Using AI will be of no benefit to me.	
13. Using AI can improve my work performance.	
14. Using AI can be enjoyable.	

External Motivational Access	Agreement: 1-strongly disagree – 5 strongly agree
15. Seeing other teachers using AI inspires me.	
16. I want to use AI because my superiors expect me to use it.	
17. I wish to use AI because my students think that I should use them.	
18. I am interested to adopt AI because my university provides enough technology support.	
Operational Skills Access	Agreement: 1-strongly disagree – 5 strongly agree
22. I feel comfortable in using AI.	
23. It is easy for me to create a prompt using AI.	
24. I feel difficulty when using AI.	
25. I can use content that I find using AI.	
Informational Skills Access	Agreement: 1-strongly disagree – 5 strongly agree
26. I always know what search terms to use when using AI.	
27. I can use advanced options to reach my required information.	
28. I feel confident to evaluate the sources of the information found using AI.	
29. I feel comfortable to synthesize information from AI	
30. It is easy for me to retrieve a content from AI.	
31. I can easily choose from results from AI.	
Strategic Skills Access	Agreement: 1-strongly disagree – 5 strongly agree
32. I can make a choice by using AU.	
33. I can reach my intended goal while using AI.	
34. It is easy for me to work toward a specific goal using AI.	
35. I can gain benefits from using AI.	
36. Using various AI tools, I feel confident in achieving my goals.	
37. I feel confident in making important decisions with the help of the AI.	
General Usage Access	Frequency: 1-not at all – 5 all the time
38. I search information of my interest using AI.	
39. I use AI to support my research activities.	
40. I use AI of the primary search tool.	

41. I use AI to create letters, reports and/or papers.	
42. I prepare presentations using AI.	
43. I store and manipulate data in a spreadsheet program using AI.	
Instructional Usage Access	Frequency: 1-not at all – 5 all the time
44. I use AI for communication about assignments among students.	
45. I use AI for enhancing students' content learning.	
46. I use AI for facilitating students' group work.	
47. I use AI to improve students' problem-solving skills.	
48. I use AI for the delivery of my instruction.	
49. I use AI to communicate with students.	
50. I prepare learning materials using AI.	
51. I develop critical thinking skills among students with the help of AI.	
52. I use AI to encourage peer-feedback among my students.	