Quasi-Development: Access alone to Artificial Intelligence like ChatGPT Is Not Enough

Joshua Vidal[1], Chrystal P. Estoquia[2], Maegan D. Concepcion[3]

[1] Editor-in-Chief, SciTech-TPO/ TDRA, CCARPH-ADMU, jvidal.school@gmail.com
[2] Research Associate, SciTech-TPO
[3] Research Fellow, SciTech-TPO

Abstract

The rapid adoption of generative Artificial Intelligence (GAI) tools such as ChatGPT has led to the widespread assumption that simply granting access to AI promotes educational equity and deeper learning. However, initial observational findings indicate that students and teachers experience unequal cognitive benefit from AI—even when using identical prompts. This paper examines this phenomenon as a form of quasi-development, wherein technological access is widespread but meaningful empowerment remains uneven. Drawing on a synthesis of peer-reviewed studies on digital inequality, AI literacy, cognitive scaffolding, and socio-technical learning environments, combined with empirical observations of AI response variation across devices, internet speeds, and account tiers, this paper argues that AI amplifies existing educational disparities rather than resolving them. The discussion proposes a new paradigm of critical AI literacy, moving from mere access to guided interpretation, prompt reasoning, and epistemic evaluation. The paper concludes that equitable implementation of AI requires infrastructural support, teacher mediation, and the integration of AI reasoning frameworks into formal instructional design.

Introduction

Artificial Intelligence has rapidly become a defining technology in contemporary educational discourse. Classrooms, universities, government training centers, and private learning platforms now position AI tools—particularly large language models (LLMs) like ChatGPT and Gemini—as universal academic assistants. Students use AI to summarize readings, generate explanations, complete problem sets, and draft essays. Teachers use it to create lesson plans, personalize feedback, differentiate instruction, and reduce administrative workload. Governments, schools, and technology companies promote narratives of "education democratized through AI."

Yet an emerging contradiction disrupts this optimism: access does not guarantee benefit. In an experimental classroom prompt activity, the same question about the scientific timeline of the universe was input into ChatGPT across varied devices, connection speeds, and

account types. The results showed substantial variability in depth, structure, accuracy, supporting evidence, and reasoning quality. Some users received rigorous, scholarly explanations with citations; others received short, vague, or subtly inaccurate responses. These findings suggest that the performance of AI is not uniform across users, even when the task is held constant. This raises a critical question: Does access to AI democratize learning, or does it create a surface appearance of equity while reinforcing cognitive privilege beneath it? This paper describes this situation as a quasi-developmental state in which modernization is visible, but meaningful empowerment remains uneven.

2. Literature Review

2.1 Generative AI in Education: Access vs. Empowerment

The rapid adoption of generative Artificial Intelligence (AI) tools in education has sparked optimism that simply granting access to AI will democratize learning. Classrooms worldwide are becoming "AI-ready," with teachers using AI to plan lessons and students turning to it for research help. Yet a critical question arises: Does access to AI automatically mean everyone benefits equally? Research suggests the answer is more complicated[1]. Widespread access has revealed a new kind of digital divide, one not just of connectivity, but of cognitive empowerment. Some students and teachers gain deep, scholarly insights from AI, while others, using the very same tools, receive shallow or even inaccurate outputs. This review examines how AI in education can inadvertently amplify existing disparities rather than resolve them. It synthesizes findings on digital inequality, AI literacy, output variability, and the need for pedagogical scaffolding, ultimately arguing for a shift from mere access to critical AI literacy and equitable support structures.

2.2 Digital Inequality in the AI Era: Access Gaps Persist

Decades of research on the digital divide caution that universal access does not equal universal benefit. The digital divide refers not only to unequal connectivity and device availability, but also to disparities in infrastructure quality, affordability, and user skills[2]. These gaps lead to unequal opportunities for information access and participation. For instance, even by 2024 many rural or low-income communities still lack reliable broadband, limiting their ability to leverage AI resources effectively[3]. OECD analyses show that socio-economically advantaged schools have far greater capacity to integrate digital tools than disadvantaged schools, resulting in uneven readiness for AI-powered learning[4]. In short, modernization is visible but not equally experienced – many students technically have the internet and AI at their fingertips, yet face hidden barriers to meaningful use.

Beyond Access – Usage and Skills: Researchers describe a "second-level digital divide," where even among those with access, differences in how technology is used create stratification. Factors like digital skills, support at home, and prior exposure shape whether AI tools are used for higher-order learning or just superficial tasks. A student who lacks guidance in using AI may stick to basic queries that yield trivial answers, whereas a more digitally fluent

peer can unlock complex, in-depth insights. As one policy report notes, gaps in digital skills and usage can magnify existing offline inequalities – without the ability to effectively harness digital tools, simply having them isn't enough[5]. This insight aligns with long-standing findings that underprivileged learners often engage in more limited or rote use of educational technology, missing out on the creative or critical applications that benefit their advantaged peers.

AI Amplifying Disparities: Early evidence indicates that generative AI may be following these patterns. A recent study in China found that while AI tools hold promise, they might "inadvertently perpetuate the same crises across different demographics, amplifying existing inequalities". In this scenario, "the strong may become stronger, while the vulnerable risk further marginalization," largely because those with superior resources and preparation can extract far more value from AI[6]. For example, a well-funded school with tech support might use AI to personalize learning and boost student outcomes, whereas an under-resourced school might use the same AI in a minimal way (e.g. auto-generating worksheets) that yields little genuine benefit. Thus, paradoxically, AI could widen learning gaps under the guise of equal access. Researchers have termed this a form of "quasi-development" – a state where technological modernity is present, yet substantive empowerment remains uneven. As Vidal puts it, technology still "favors those with better access" even when it claims to be universal[7]. Ensuring that AI truly democratizes education requires addressing these infrastructural and skill-based divides head-on.

2.3 AI Literacy and Prompt Skills

From Access to Competence: Given that having AI is not enough, the concept of AI literacy has gained prominence. AI literacy means understanding how AI works, its strengths/limitations, and knowing how to effectively interact with it. Simply using ChatGPT is different from using it well. A 2024 review by Walter underscores that "AI literacy is identified as crucial, encompassing an understanding of AI technologies and their broader societal impacts." Moreover, prompt engineering, the craft of writing effective inputs for AI "is highlighted as a key skill for eliciting specific responses from AI systems, thereby enriching educational experiences and promoting critical thinking."[8]. In other words, students and teachers need to learn how to ask the right questions in the right way. Without this skill, they may get superficial answers that reinforce passivity.

Prompt Specificity Matters: Studies have shown that the quality of AI output correlates with the quality of the prompt. For instance, Gemini Knowledge Card: Prompts: Be Clear and Specigic - Business Library (2024) demonstrated that vague queries often yield generic or shallow answers from an AI, whereas specific, well-scaffolded prompts can trigger more detailed and useful responses. In practice, a question like "Explain this concept" may produce a cursory explanation, but adding requirements for evidence, examples, or a certain perspective can result in a far richer output[9][10]. One experiment asked an AI, "My teacher talked about the origin of the universe, but I didn't fully understand the timeline. Can you explain it comprehensively, with proper documentation, evidence, and scholarly discussion?" a deliberately detailed prompt. Some users indeed received rigorous, cited explanations, showing the power of a well-crafted query[9]. The takeaway is that students must be taught how to formulate questions and tasks for AI. This is analogous to traditional information literacy knowing how to phrase a research query or how to probe a source, now applied to interacting with a digital assistant.

Scaffolding for Novice Users: Not everyone has high AI literacy from the start. Particularly for younger students or language learners, guidance in using AI can prevent unproductive

usage. Kohnke & Moorhouse (2022) note that chatbots and AI tutors, if used with some scaffolding, can provide language learners with immediate practice and answers to common questions, building confidence[11]. Without guidance, however, these learners might stick to yes/no questions or overly simple tasks, yielding "AI homework" that doesn't challenge them. Educators are finding that providing prompt templates or example interactions helps novices get beyond superficial Q&A. For example, instead of asking an AI "What is photosynthesis?", a scaffolded prompt might be "Explain photosynthesis to a 5th grader and give two everyday examples, citing credible sources." The latter prompt teaches the student how to engage the AI in a deeper way and to expect evidence-backed answers. Ultimately, developing AI literacy is now an essential part of digital literacy. Students need to not only know how to use tools, but how to question and critique the outputs they get.

2.4 Variation in AI Output Quality

Unequal Outputs from "Equal" Prompts: A striking finding in emerging research is that AI systems do not provide uniformly consistent answers for all users, even with identical prompts. In an observational study, Vidal (2025) and colleagues discovered that when the *exact same prompt* was input into ChatGPT (and a similar tool, Gemini) under different conditions, the responses varied dramatically[12]. They asked the AI a question about the timeline of the universe's creation (a science query), specifying that the answer should be comprehensive and evidence-backed. Despite the prompt being held constant, *some users received long, well-structured explanations with scholarly citations, while others got only short or vaguely worded summaries*[12][13]. A few even encountered subtly inaccurate information. This experiment reveals that factors beyond the prompt itself are influencing the AI's performance.

Factors Influencing AI Responses: What could cause such disparity if the AI model is ostensibly the same? The study pinpointed several "invisible" technical and situational factors: device type, internet speed, account tier, server load, and time of day were all correlated with output quality[14]. For instance, using a high-end laptop on a fast, stable connection with a paid "premium" AI account often yielded the most thorough answers. In contrast, a user on a basic smartphone over spotty Wi-Fi, using a free version of the AI, tended to get briefer and sometimes cut-off replies. These differences likely stem from how the AI service allocates computing resources. Premium or high-bandwidth users may get priority access to the best models or more processing time, whereas others face rate limits or shortened responses due to latency and load management[7]. As a result, the "same" AI tool isn't truly the same for everyone – performance is tiered by technical context. Panagiotou & Ntoutsi (2023) similarly reported that sequential counterfactual (SCF) outputs or causes errors.

Technology Still Favors the Privileged: In Vidal's experiment, *"those who had faster internet or paid versions of the software received stronger, more detailed answers," while users with slower connections or free access "often got shorter or fragmented responses."* The conclusion was clear – *"technology still favors those with better access, even when it claims to be universal."*[7]. This has profound implications. If two students ask the same question but one gets a high-quality tutorial and the other a mediocre blurb, AI has essentially conferred an advantage on the already advantaged student (who perhaps had the better device or subscription). Such variability can reinforce the cognitive privilege of students from better-resourced environments. It also raises fairness concerns in assessment: imagine one student using AI got a detailed hint on a homework problem while another got none due to a truncated answer. Educators and AI providers must recognize these disparities. Potential

steps include optimizing AI services for low-bandwidth scenarios, transparently communicating limitations of free versions, and perhaps even offering institutional AI access in schools to level the playing field. Until addressed, this uneven performance means that access alone to AI is not a great equalizer—the quality of access matters greatly.

2.5 Teacher Mediation and Cognitive Scaffolding

Advocates of AI in education often depict it as a sort of autonomous tutor that can replace or reduce the role of teachers. However, educational research strongly advocates for the continued – even enhanced – role of teacher mediation when AI is introduced. The reason is simple: interpretation, critical thinking, and guidance are needed to turn AI outputs into learning. Vidal (2023) argues that AI tools work best *in tandem* with human teachers, not as standalone instructors. The teacher provides the pedagogical framework, context, and ethical oversight that an AI lacks.

Active Engagement vs. Passive Consumption: A study by Narang (2023) discussed that Generative artificial intelligence (GenAI) is becoming significantly integrated into learning environments, however, surprisingly, most of these integrated engagement remains to be limited to understanding of how different AI performs output influence outcome. Moreover, the study encourages active engagement as this clearly supports deeper learning, or as we say in this paper "meaningful learning". The interaction with AI should accelerate inquiry-driven dialogue, analytical reasoning, and metacognitive awareness. On the other hand, however, passive consumption is present in most of these AI engagements–where responses are taken at face value– tends to reduce cognitive effort and may decelerate development of evaluative judgement.

Therefore, educators remain central in scaffolding in cultivating critical AI literacy. Educators can guide students to ask: *"Does this answer make sense? What evidence is backing it? Should I verify this information elsewhere?"* Without a teacher's influence, students may develop an over-reliance on AI or fail to develop the discernment to gauge AI-provided information.

Teachers as AI Literacy Coaches: With AI in the classroom, a teacher's role extends to being an AI literacy coach. This involves showing students how to phrase questions, how to refine prompts after an initial attempt, and how to interpret AI responses. For example, if an AI explanation is confusing, the teacher might suggest follow-up prompts like *"Can you clarify that with an example?"* or *"Explain that in simpler terms."* Such strategies echo good teaching practice (asking students to elaborate or justify answers) but are now directed at using the AI tool effectively. Denny et al. (2023) found that when guided students through prompt iterations – essentially teaching through the AI – students retained feedback better and produced higher-quality revisions in their work. The teacher provides the cognitive scaffolding that helps students climb from a basic question to a deeper exploration using AI as a stepping stone.

Structured Scaffolding Yields Deeper Learning: A recent experiment in the Philippines by Fernandez (2025) underscores the power of structured guidance when using AI. In an arts course, students were taught a scaffolded framework (Claim-Evidence-Reasoning) to analyze images, including distinguishing AI-generated images from human-made ones. Those given this structured approach, combined with AI tools, showed *significantly higher gains in visual analysis skills* compared to those with traditional instruction. Students reported that the scaffolded approach "deepened critical thinking and creative engagement,"

though it required adjustment for some[15][16]. The key point is that AI's benefits were unlocked by a deliberate pedagogical framework. The AI alone could provide images or basic analysis, but the teacher-designed scaffolding pushed students to critically examine and compare, thereby achieving higher-order thinking. This finding parallels what Denny et al. (2023) found that when guided students through prompt iterations higher-quality revisions in their work produced.

Human-AI Collaboration, Not Replacement: Ultimately, the presence of AI does not diminish the teacher's importance – it *modulates* it. Teachers become orchestrators of human-AI collaboration. They must know when to step in and when to step back. For instance, after an AI gives an answer, a teacher might facilitate a class discussion: *"Do we agree with this solution? Why or why not? What would you ask the AI next?"* This turns AI into a springboard for dialogue and critical analysis. As one recent commentary put it, teachers and students should use AI to "start with human, end with human", ensuring human judgment frames the inquiry at the beginning and the interpretation at the end[17][18]. Vidal's classroom observations support this: *"teachers remain central… they help students question, refine, and verify what AI tells them."*[10] Without that human element, students might take AI outputs as gospel or use them unreflectively. With guidance, however, even a flawed AI response becomes a teachable moment (e.g., spotting the flaw, correcting it, learning from the AI's mistake). The consensus in emerging research is that integrating AI into formal instruction should be done through structured, teacher-led strategies (e.g. the TPACK model of tech integration with pedagogy and content knowledge in mind) rather than letting the AI run loose in the classroom.

2.6 Socio-Technical Considerations and "Quasi-Development"

The enthusiasm around AI in education often comes with an implicit assumption that the technology is a neutral tool – an equal opportunity tutor that will benefit all students. However, critical scholars caution that technology is never truly neutral[19]. AI systems are products of the data and values they are built on, and they operate within social contexts that can skew their effects. Safiya Noble (2018) famously showed how search engine algorithms reinforced racial biases, concluding that *"technology is not neutral. How it is used and for what ends reflects the social norms and values of a given culture."* As applied to education, if AI tools are introduced without a lens for equity, they may end up reproducing or even exacerbating societal disparities[19]. For example, an AI writing assistant might systematically struggle with or ignore dialects and vernacular language, thereby privileging one linguistic group over others. Or a content recommendation AI might direct richer learning resources to students already performing well (based on their interaction history), while giving simpler, remedial content to struggling students – potentially boxing them into a lower learning trajectory.

Invisible Biases and Assumptions: Researchers like Maalsen (2023) discussed that while much geographical scholarship critiques algorithms for producing harm and discrimination, e.g. artificial intelligence, there is less attention has been given to how algorithms shape knowledge and ways of understanding the world. Scholl (2021) has similarly warned that without conscious governance and ethical oversight, AI-driven solutions can deepen existing inequalities. This is not due to malice, but because AIs optimize for certain outcomes (e.g., efficiency, generalized answers) that might conflict with goals like inclusion or critical pedagogy. As an example, a math tutoring AI might inadvertently give more attention (through its adaptive algorithm) to students who respond quickly, thereby shortchanging those who need more time, unless it's programmed to counteract that bias.

The Illusion of Progress: The term *"quasi-development"* introduced by Vidal encapsulates the situation many schools find themselves in: on the surface, they have modern AI tools (the classroom looks "developed"), but underneath, true empowerment is lacking or uneven. Vidal's work in Southeast Asian classrooms noted that after introducing AI, any *"illusion of progress"* was shattered once one looked at who was actually benefiting. Students' ability to gain knowledge from the AI still depended on often invisible variables like their English proficiency (since most generative AI currently functions strongest in English), the quality of the device they were using, the stability of their internet, and crucially, whether a teacher helped them make sense of AI outputs. One vivid outcome from his study was that "AI does not behave equally for all users", reinforcing the point that *nominal* access is not enough[20][7].

This has led to calls for a new paradigm of critical AI literacy in education – one that moves beyond celebrating access. Critical AI literacy involves teaching students and teachers to interrogate AI outputs (ask: *Who wrote this answer–a human or a machine? What sources does it rely on?*), to understand the limitations and potential biases of AI, and to integrate AI-derived information with other knowledge sources. It also means policymakers should be careful of "techno-optimism without critical pedagogy" (Jessifer et al., 2020). That is, we shouldn't assume putting ChatGPT in every classroom automatically equals innovative pedagogy. Real innovation would be adjusting curricula to include AI reasoning frameworks, ethics discussions, and reflective activities where students compare their own thinking with an AI's reasoning.

Towards Equitable AI Integration: To avoid deepening the rift between the "AI haves and have-nots" in a cognitive sense, experts propose several measures. *Infrastructural support* is fundamental – this could mean national programs to provide high-speed internet and adequate devices to all schools, akin to providing textbooks in the past. It also might involve AI providers creating lighter versions of models that run offline or on low bandwidth, so that a student in a remote area isn't left with half-baked answers[7]. Next, teacher professional development is key. Teachers need training not just in using AI tools, but in weaving them into lesson plans effectively and ethically (for example, how to prevent AI from doing the thinking for students). Involving teachers in co-designing AI-infused lessons ensures the technology serves pedagogical goals, not the other way around[10].

Finally, integrating AI reasoning frameworks into the curriculum can empower students. This means teaching with models like the Human-AI-Human cycle[21][18] – where students learn to initiate inquiries, let the AI assist, then critically conclude the task themselves. It could also mean including modules on AI ethics in the curriculum, so students are aware of issues like algorithmic bias and the importance of human oversight. Selwyn (2022) emphasizes examining the power dynamics of Educational Technology just like Artificial Intelligence: Who controls the AI platforms? Whose knowledge is represented? By raising these questions in the classroom, students become not just consumers of AI outputs, but informed citizens who can navigate and challenge the socio-technical systems around them.

2. Methods

This study employs a qualitative meta-synthesis approach, integrating observational data with thematic interpretation from peer-reviewed research. The primary reference point derives from documented variability in AI outputs across user contexts (see figure 1), supported by educational technology research literature. Articles were selected based on

relevance to AI literacy, digital inequality, cognitive scaffolding, or educational equity, otherwise, excluded.

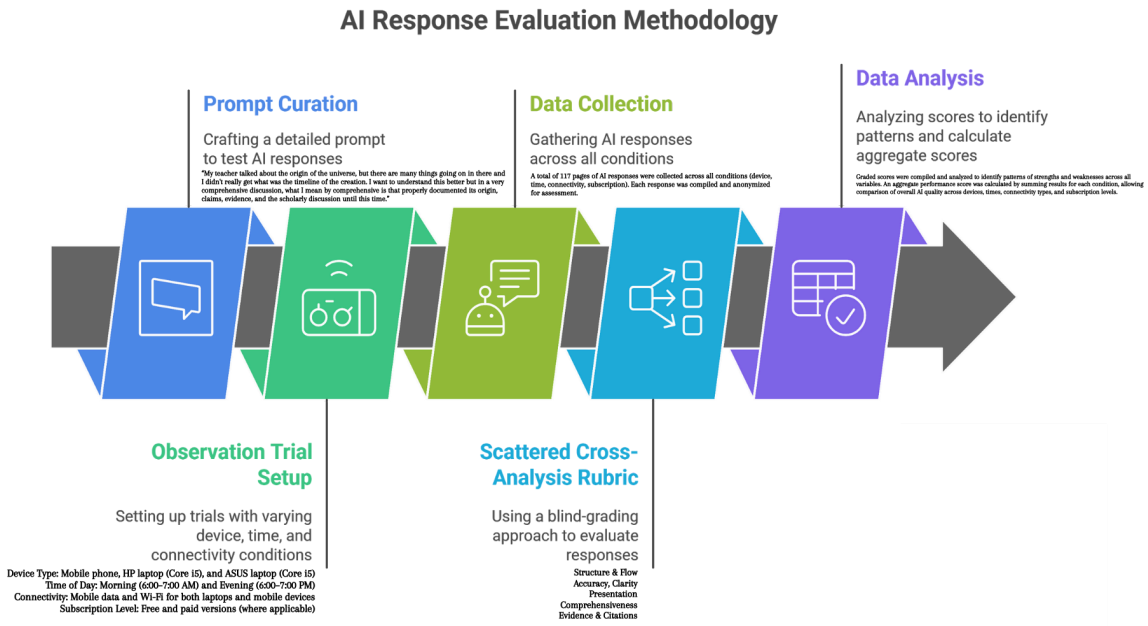

Figure 1. AI Response Evaluation Methodology
(source: The author)

3. Results

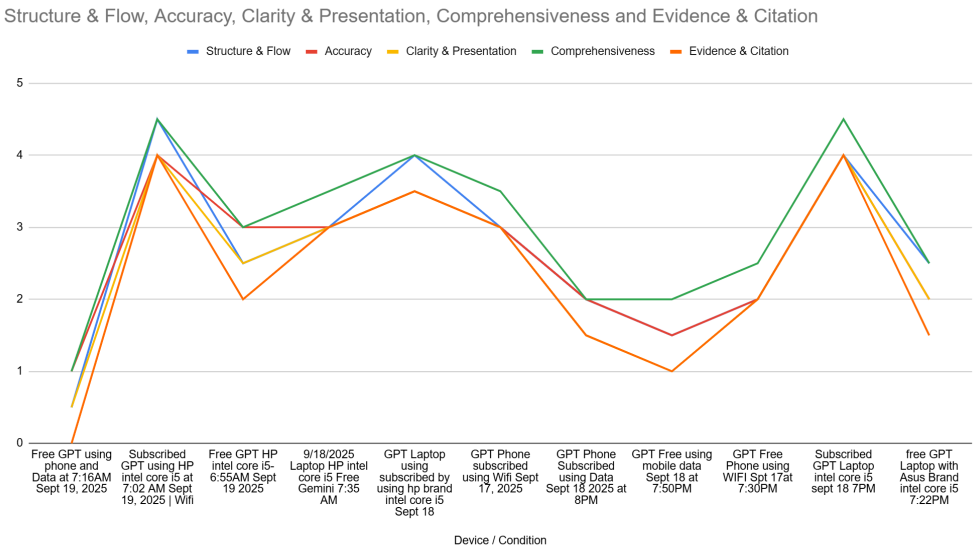

Figure 2. Device Responses on the same prompts

3.1 Unequal AI Output Quality

Differences in AI-generated responses were found to correlate with device performance capacity, connection stability, and subscription tier. Users operating premium accounts or stable broadband connections received more coherent, in-depth, and academically structured outputs than those on free-tier systems or mobile data connections.

3.2 Prompt Crafting as a Determining Factor

Students who demonstrated the ability to compose layered, specific prompts consistently achieved superior outcomes. Conversely, those with less familiarity in structuring prompts often received shallow or generalized responses, reinforcing the importance of critical engagement rather than passive consumption.

3.3 AI Does Not Replace Teachers

In classroom contexts where instructors scaffolded AI usage—clarifying terms, prompting reflection, and evaluating accuracy—students demonstrated deeper conceptual understanding. Where such mediation was absent, AI tended to reinforce knowledge gaps rather than address them.

4. Discussion

The findings reveal a gap between the appearance of digital democratization and the reality of uneven cognitive empowerment (see table 1). This aligns with the concept of quasi-development, wherein modernization initiatives expand access but do not necessarily foster equitable outcomes. AI functions not as a neutral or equalizing tool, but rather as an amplifier of existing cognitive and infrastructural advantages.

Table 1. Factors Influencing Variation in AI Output Quality

Variable	Effect on AI Output
Device Type	Higher processing power correlates with more stable output generation.
Internet Stability	Unstable networks result in truncated or incomplete AI responses.
Subscription Tier	Premium users receive prioritized computation and richer output.
Prompt Complexity	Layered prompts produce deeper, more analytical explanations.

4.1 Cycle of AI Learning Environment Development

The figure below (see figure 3) demonstrates the sequential check and balance of the use of Artificial Intelligence to ensure meaningful learning outcomes. Rather, educational benefit emerges from an iterative cycle involving four interconnected components: AI access, Usage Mediation, Cognitive Benefit Gap, and Development Outcome.

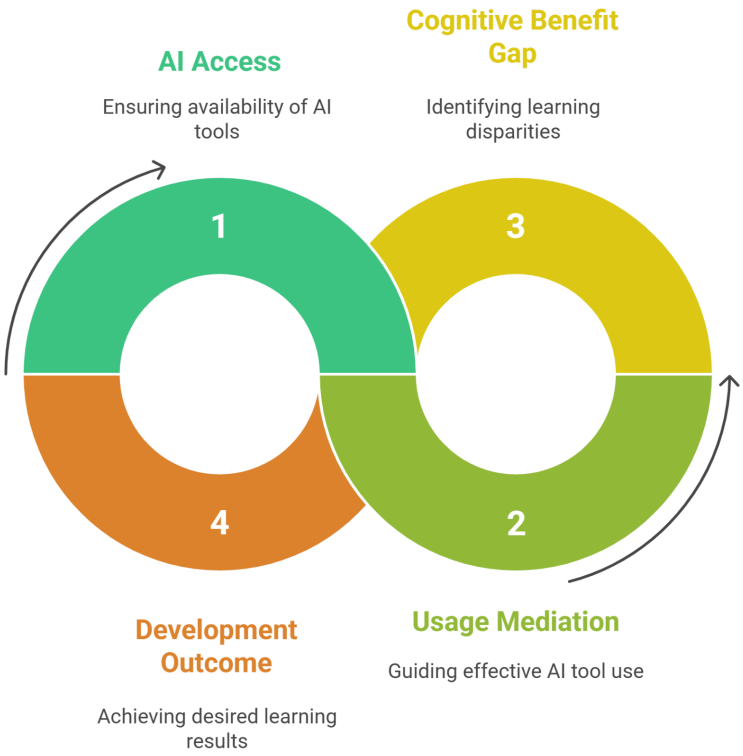

Figure 3. Cycle of AI Learning Environment Developement
(source: The author)

4.1.1 AI Access

This stage focuses on providing users with the opportunity to use AI tools. Institutions often stop here, believing that simply giving users to the tool will automatically enhance learning. However, access only establishes the conditions for learning; it does not determine how users will use AI or what they will experience from it.

4.1.2 Usage Mediation

This stage underscores the essential role of teachers, instructors, and learning designers in guiding how AI is used. Mediation involves teaching students how to (1) Ask critical questions, (2) Verify AI-generated claims, (3) Revise prompts, (4) Interpret uncertainty or gaps in the AI's responses. This keeps AI away from being a source of answers to being a cognitive partner that supports thinking. Remember, failure to mediate, students may fall into passive consumption, taking AI outputs at face value.

4.1.3 Cognitive Benefit Gap

It is necessary to digest that even when students have access and guidance, learning gains are not uniform (for now). Some students, often those with stronger prior knowledge or metacognitive skills, extract more benefit from AI interactions among others. This stage

involves identifying *where* and *why learning* disparities emerge. The gap reveals that AI can reinforce existing inequalities unless deliberate scaffolds and reflective practices are integrated.

4.1.4 Development Outcomes

The final stage reflects the measurable learning results: conceptual understanding, skill development, critical literacy, or problem-solving ability. Most importantly, the outcome feeds back into prior stages—informing educators about what adjustments are needed in access, mediation, or essential strategies.

5. Conclusion

AI access alone does not equate to educational empowerment. Without infrastructural support, teacher mediation, and structured instruction in prompt reasoning and critical evaluation, AI risks deepening existing inequities. For AI to become a genuine tool for democratizing learning, it must be accompanied by cultural and pedagogical frameworks that teach students how to think with AI—not merely through it.

6. Acknowledgement

The authors extend their sincere gratitude to the co-researchers and research fellows of Science and Technology – The Publication Office, as well as the Department of Science in Basic Education of UNIDA Christian Colleges, for their intellectual generosity in reviewing, questioning, and refining the ideas that shaped this work. Your engagement and thoughtful critique were instrumental in strengthening the academic direction of this study. We also thank the peer reviewers for their openness in engaging with this discussion, even in areas where empirical evidence remains emerging. Your contributions have helped advance this conversation and encouraged its continued evolution in future research and practice.

References

1. OECD – *Digital divide in education* (2025). *Definition and key messages on infrastructure, skills, and outcomes disparities*[2][4].
2. Li, H. (2023). *AI in Education: Bridging the Divide or Widening the Gap?* – Findings on AI potentially **amplifying inequalities**, "strong may become stronger"[6].
3. Walter, Y. (2024). *Embracing the future of AI in the classroom* – Emphasizes **AI literacy and prompt engineering** as crucial skills[8].
4. Kohnke, L. & Moorhouse, B. (2022). *Pedagogical Chatbots for Language Learning* – Chatbots can provide prompt answers for learners, highlighting need for **scaffolded AI interactions**[11].
5. Vidal, J. (2025). *Quasi-Development: Access alone to AI is Not Enough* – Classroom study showing **variation in AI outputs** across devices and connections; "technology still favors those with better access"[12][7].
6. Vidal, J. (2025). *Ibid.* – Noted that **teachers remain central** to help students refine and verify AI-provided information[10].
7. Vidal, J. (2023). The Outlook of Emerging Technology in Education. Online Submission.
8. Vidal, J. (2023). Emerging technologies: The birth of artificial intelligence (AI) in education. Available at SSRN 4512063.
9. Fernandez, M. P. Scaffolding Visual Analysis in CPAR with Human and AI-Generated Images.[23].
10. Noble, S. (2018). *Algorithms of Oppression*. Interview excerpt: **"Technology is not neutral…often reproduces social inequality"**[19] – warns that without critical oversight, digital tools can reinforce power imbalances.
11. De Cremer, D., & Narayanan, D. (2023). How AI tools can—and cannot—help organizations become more ethical. How AI Tools Can—and Cannot—Help Organizations Become More Ethical, 6(1093712). https://doi.org/10.3389/frai.2023.1093712
12. Narang, U. (2023). Bot to School: The Impact of Generative Artificial Intelligence in Online Learning Platforms. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4558719
13. Denny, P., Leinonen, J., Prather, J., Luxton-Reilly, A., Thezyrie Amarouche, Becker, B. A., & Reeves, B. (2023). Promptly: Using Prompt Problems to Teach Learners How to Effectively Utilize AI Code Generators. *ArXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2307.16364
14. Maalsen, S. (2023). Algorithmic epistemologies and methodologies: Algorithmic harm, algorithmic care and situated algorithmic knowledges. *Progress in Human Geography*, 030913252211494. https://doi.org/10.1177/03091325221149439
15. Scholl, H. J. (2021). The Digital Government Reference Library (DGRL) and its potential formative impact on Digital Government Research (DGR). *Government Information Quarterly*, 101613. https://doi.org/10.1016/j.giq.2021.101613
16. jessifer, Friend, C., & Morris, S. M. (2020, July 27). *Introduction: The Urgency of Critical Digital Pedagogy*. Critical Digital Pedagogy; Hybrid Pedagogy Inc. https://pressbooks.pub/cdpcollection/front-matter/introduction/
17. Selwyn, N. (2022). The Future of AI and education: Some Cautionary Notes. *European Journal of Education*, *57*(4). https://doi.org/10.1111/ejed.12532

18. *Gemini Knowledge Card: Prompts: Be Clear and Specigic - Business Library*. (2024). Ufl.edu. https://answers.businesslibrary.uflib.ufl.edu/genai/faq/411458
19. Panagiotou, E., & Ntoutsi, E. (2023). *Learning impartial policies for sequential counterfactual explanations using Deep Reinforcement Learning*. ArXiv.org. https://arxiv.org/abs/2311.00523

---

[1] [7] [9] [10] [12] [13] [14] [20] [22] Quasi-Development: Access alone to Artificial Intelligence like ChatGPT Is Not Enough | by Joshua Vidal | Oct, 2025 | Medium

https://medium.com/@jvidal.school/quasi-development-access-alone-to-artificial-intelligence-like-chatgpt-is-not-enough-c6a729a0af0e

[2] [3] [4] [5] Digital divide in education | OECD

https://www.oecd.org/en/topics/sub-issues/digital-divide-in-education.html

[6] AI in Education: Bridging the Divide or Widening the Gap? Exploring Equity, Opportunities, and Challenges in the Digital Age | Advances in Education, Humanities and Social Science Research

https://madison-proceedings.com/index.php/aehssr/article/view/1924?__HY=3a2a892760b2c38f148ac7c5e6f0c9b1a1762400684_409298

[8] 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 | Full Text

https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-024-00448-3

[11] (PDF) Beyond Traditional Instruction: Using Chatbot to Enhance English Writing Skills in University Settings

https://www.researchgate.net/publication/389329169_Beyond_Traditional_Instruction_Using_Chatbot_to_Enhance_English_Writing_Skills_in_University_Settings

[15] [16] [23] Scaffolding Visual Analysis in CPAR with Human and AI-Generated Images - Mendeley Data

https://data.mendeley.com/datasets/yykkkz2s2k/1

[17] [18] [21] When Using AI in Scientific Research: Start with Human, End with Human | TechTrends

https://link.springer.com/article/10.1007/s11528-025-01132-7

[19] How algorithms reproduce social and racial inequality - Salon.com

https://www.salon.com/2018/09/15/how-algorithms-reproduce-social-and-racial-inequality/