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Research Article

Reimagining Learning in Cambodian Classrooms: The Impact of ChatGPT on Student Performance, Perception, and Critical Thinking in the Digital Age

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Abstract: This study investigates the transformative potential of a generative artificial intelligence (AI) tool to reshape Cambodian education by improving student performance, enhancing learning perceptions, and fostering critical thinking. Through an integrated thematic analysis of global literature spanning 2022 to 2025, the article synthesizes empirical findings and conceptual ideas, aligning them with Cambodia's post-pandemic education reforms and digital policy agendas. When combined with culturally grounded pedagogy and suitable instructor facilitation, AI can personalize learning, encourage student agency, and scaffold higher-order thinking, according to this scholarly paper. Still, it also draws attention to important issues, including the digital divide, low AI literacy among teachers, and ethical questions such as plagiarism and bias. Using a global, national, and local framework, the debate positions worldwide trends within the Cambodian reality and suggests localized implementation solutions. Among the main suggestions are launching AI pilot projects, developing Khmer-language models, funding teacher development, and enhancing public-private cooperation. The paper ends by noting future research targets, including classroom-based studies and cross-country comparisons of ASEAN policies, thereby providing a roadmap for fair and ethical AI inclusion in Cambodian classrooms.

Keywords: Education in Cambodia; Digital learning; Artificial Intelligence; Critical thinking

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Introduction

The COVID-19 pandemic accelerated a radical shift in global education and compelled systems to adopt digital delivery models at hitherto unheard-of rates. The essay aggregates empirical facts and theoretical frameworks from global literature spanning 2022 to 2025. It achieves this by integrating them with Cambodia's digital strategy and educational advancements post-outbreak (Em et al., 2024). This academic research indicates that ChatGPT can personalize learning, enhance student autonomy, and promote deeper cognitive engagement when utilized alongside culturally relevant pedagogical methods and suitable teacher support. (MoEYS, 2020). However, technology also brings up a lot of problems, such as the digital divide, teachers not understanding AI well enough, and ethical issues like bias and plagiarism.

The talk uses a global framework to examine global trends in Cambodia and to suggest ways to put them into practice in specific places. Some key recommendations include establishing AI pilot projects, developing Khmer-language models, providing teachers with funding to support their professional development, and improving public-private sector engagement. (UNICEF, 2021). Finally, the report discusses future research priorities, including longitudinal classroom studies and cross-country comparisons of ASEAN policy. This provides a clear plan for implementing AI in Cambodian classrooms in a fair and ethical manner. This disparity underscores the persistent digital divide in Cambodia, particularly between urban centers such as Phnom Penh and underserved rural provinces. According to APO (2022) and Oum and Savuth (2023), only 33% of households in rural areas have internet access, compared to 70% in urban areas. Furthermore, only 18% of public school teachers reported receiving adequate training in digital tools for remote instruction. These challenges, compounded by economic inequities and linguistic barriers, have contributed to significant learning loss and widened educational inequalities during the pandemic years. (ADB, 2022; UNESCO, 2020).

Generative artificial intelligence (AI), most famously developed by OpenAI, marks a significant shift in educational technology in this post-pandemic digital landscape. Originally presented to the public by Wan and his associates in late. (2022)ChatGPT is based on large language models (LLMs), specifically GPT-3.5 and GPT-4, capable of producing coherent, context-aware text, answering questions, and mimicking human-like interaction. Its uses in the classroom are many: from essay comments and language instruction to research support and encouragement of critical thinking. A recent meta-analysis by Wang and Fan (2025), synthesizing 51 empirical studies, confirmed that students who utilized ChatGPT showed statistically significant increases in academic performance, learning perception, and higher-order thinking. By contrast, Ribeiro et al. (2023) noted that, when combined with appropriate pedagogical scaffolding, ChatGPT enhances cognitive engagement and self-regulated learning. Educational institutions across are presently debating how best to maximize ChatGPT's features while addressing issues with academic integrity, disinformation, and algorithmic bias.

ISSN 2349-4948

Research such as that by Baidoo-Anu and Ansah (2023) underscores ChatGPT's ethical challenges and educational potential in classroom settings. This is consistent with past conceptions of artificial intelligence in education; an OECD (2023) study compares how nations are building their digital education ecosystems, including the incorporation of AI systems. However, in low- and middle-income nations (LMICs), such as Cambodia, the unquestioning acceptance of such technologies risks exacerbating digital exclusion unless they are part of inclusive policy frameworks. Especially, the national education plans of Cambodia already acknowledge the importance of digital transformation. Key foundations for long-term education quality outlined by the Education Strategic Plan 2019–2023 include ICT integration, teacher digital skills development, and curriculum reform. (MoEYS, 2019). Under evaluation as of early 2025, the draft Digital Education Strategy 2024 underlines even more basic digital competences, inclusive access, and alignment with the larger Digital Economy and Society Policy Framework 2021–2035 (RGC, 2021). Still, implementation is patchy even with these aspirations.

Many public schools still lack basic digital infrastructure, and systematic professional development in AI-related pedagogy is essentially absent. Therefore, even if ChatGPT and related artificial intelligence tools offer hitherto unheard-of opportunities to reinvent education in Cambodia, these developments must be used wisely, with tailored coaching, real-time feedback, and inquiry-based learning. As UNESCO (2020) warns, responsible AI integration calls not only for technological preparedness but also for ethical protections, teacher agency, localized content, and learner protection. The AI moment for Cambodia must be negotiated through strategic planning anchored in equity, cultural sensitivity, and capacity-building to make sure AI functions as a bridge rather than a barrier to inclusive, high-quality education.

Although generative artificial intelligence in education is attracting increasing attention worldwide, Cambodia lacks a strong conceptual and empirical basis to direct its application. High-income nations, especially North America, Europe, and East Asia, where access to devices, strong networks, and AI-literate teachers is comparatively high, have most of the research on ChatGPT's educational benefits. (Susnjak, 2024). By contrast, several structural inequities in Cambodia's educational system limit the direct transferability of such results. Urban schools may be better resourced, but most rural and underprivileged areas still lack regular internet connectivity, suitable equipment, and IT support services. (UNDP, 2024; UNICEF EAPRO, 2024).

The differences in technological infrastructure are significant. Though infrastructure and teacher preparedness remain issues, Cambodia has started the Digital Education Strategy for Schools (DESS) to include more digital elements and artificial intelligence into education (Huot & Em, 2025; Kiripost, 2023, August 16). The legal framework guides the ethical, pedagogical, and language integration of artificial intelligence in Cambodian education. Without a contextualized body of research and policy alignment, the unthinking acceptance of ChatGPT risks aggravating existing inequities, fostering digital dependency, and thereby undermining historically grounded pedagogical values. It is proposed that, by aiming at three main goals, the

ISSN 2349-4948

present research-practice gap will close: Emphasising student learning performance, perceptions of AI tools, and the development of critical thinking abilities. It first seeks to methodically analyse and integrate global information on the educational impact of ChatGPT. It builds on observational, quasi-experimental, and experimental studies carried out after the late 2022 launch of ChatGPT. Second, the paper evaluates the relevance of this global information to Cambodia's educational situation. It examines possibilities for AI integration, that is, support for cognitive development and individualised learning, while also pointing out pragmatic difficulties such as infrastructural constraints and inadequate teacher preparation. Third, the study seeks to pinpoint main hazards, required local adaptations, and supporting policy conditions for the fair and efficient implementation of ChatGPT in Cambodian schools. This covers knowledge of ethical behavior, cultural appropriateness, language localization, and curricular reform. For several players in the Cambodian educational scene, the results and revelations of this study are quite important.

At the policy level, the study offers a basic information base for AI-responsive educational planning, a knowledge base lacking from MoEYS digital plans. This is especially crucial as the nation prepares for AI integration not only in public administration but also across labor sectors, in line with broader digital transformation objectives. (RGC, 2021). This also applies in schools. From the pedagogical standpoint, the study supports the growth of teacher competence by pointing out successful AI integration strategies for classroom environments. It provides direction for courses in pre-service and in-service training, emphasising digital pedagogy, critical thinking, and ethical use of artificial intelligence. Furthermore, in line with Cambodia's goal of producing self-directed, reflective, and globally capable students, the document supports a student-centered digital innovation agenda. (Huot & Loch, 2025; Huot et al., 2025). By providing a Cambodia-specific lens, the study adds to the larger Southeast Asian debate on digital education and EdTech innovation. Given ASEAN's growing attention on AI policy harmonization, digital literacy, and educational equity, which the (ASEAN Secretariat, 2022) notes, this is especially pertinent. This scholarly study closes a significant knowledge gap in both the literature and the practice of inclusive AI integration in education by grounding the global AI discussion in the realities of a low- to middle-income country.

Literature Review

Particularly in the educational sphere, ChatGPT marks a significant turning point in the evolution of generative artificial intelligence. Built on OpenAI's LLMs, most famously GPT-3.5 and GPT-4, ChatGPT uses deep learning methods to parse enormous textual corpora and produce human-like answers to questions. These models are flexible tools for education, as they can text-translate, generate information, respond to questions, and engage in dialogic interaction (Wan et al., 2022). In education, it has been fast embraced as a tutor, providing step-by-step guidance in mathematics, science, and language subjects; as a writing assistant, helping students with grammar, structure, and argumentation; as a feedback tool, enabling iterative refinement of assignments; and as a brainstorming aid, so facilitating idea generating and planning for essays and

projects (Wang & Fan, 2025). Particularly in settings where human-to-student ratios are uneven or instructional resources are limited, these multifarious roles enable teachers to enhance current teaching strategies and provide tailored support to students.

Empirical studies examining ChatGPT's educational value in improving student performance have begun to support this. Students who used ChatGPT showed statistically significant improvements in writing quality, comprehension scores, and problem-solving ability across many disciplines, according to a meta-analysis by Wang and Fan (2025) that covered 51 peer-reviewed experimental and quasi-experimental studies conducted from 2022 to 2024. With real-time grammatical correction, vocabulary enrichment, and structural recommendations (Ribeiro et al., 2023), the instrument was particularly successful in improving academic writing. ChatGPT has been used in science, technology, engineering, and mathematics (STEM) fields to explain complex ideas, assist with coding assignments, and break multi-step problems into more manageable parts. (Huot & Such, 2025; Kasneci et al., 2023). ChatGPT has helped with translating, dialogue simulations, and developing narrative writing techniques in humanities and language education settings (Baidoo-Anu & Ansah, 2023). Researchers warn against overreliance; however, if pupils rely too much on AI-generated content, this could impair their cognitive abilities. (Susnjak, 2024).

While ChatGPT can produce fluent and convincing responses, it is not immune to factual inaccuracies or hallucinations, which may mislead students without critical intervention within global impact. (Borji, 2023; Huot & Em, 2024). Students' perspectives on ChatGPT changed a lot as they learned how to use AI technology. People were apprehensive at first, but now they are quite excited, especially young people who know a lot about technology and know that ChatGPT is always available and can answer their queries straight away. According to Woo and Choi (2021), studies conducted at secondary and tertiary schools show that students see ChatGPT as a useful tool for managing academic assignments, clarifying concerns, and investigating alternative explanations when instructor aid is unavailable.

ChatGPT has been associated with increased self-directed learning, curiosity, and academic confidence, particularly in tasks such as writing, synthesis, and project planning (Fan et al., 2025). However, societal and cognitive settings shape these beliefs. In hierarchical educational cultures, such as those seen in Southeast Asia, students may be hesitant to fully accept AI-generated solutions, especially if they contradict teacher instruction or national curricula. Furthermore, some students may use ChatGPT for rote reproduction rather than discovery, raising worries regarding surface learning and plagiarism. (Floridi & Chiriatti, 2020). One of the most promising educational applications of ChatGPT is the development of critical thinking and metacognitive abilities. When utilized correctly, ChatGPT can function as a dialogic partner, engaging students in Socratic questioning, hypothesis testing, and reflective learning.

For example, it can encourage students to consider alternative views, rethink their thinking, or investigate the ramifications of their ideas (Baidoo-Anu & Ansah, 2023). Nonetheless, its potential is heavily dependent on the quality of prompt design and the level of facilitation provided by instructors. Without planned direction, students

ISSN 2349-4948

may receive superficial or generic responses that fail to challenge their thinking. Researchers have emphasized the significance of timely engineering and teacher moderation in maximizing the cognitive benefits of AI engagement (Huot & Tep, 2025; Kasneci et al., 2023). Furthermore, the lack of actual reasoning ability in LLMs needs careful framing, as ChatGPT may appear to engage in critical thinking without actually doing so (Janse van Rensburg, 2024). Cambodia's digital education growth has accelerated in recent years, especially since the pandemic, though significant infrastructure and talent gaps remain. The MoEYS ICT in Education Roadmap 2021-2025 outlines plans to integrate digital technologies across all levels of education. This includes increasing internet connectivity, supplying digital gadgets, and training teachers in digital pedagogy (MoEYS, 2020).

According to UNESCO (2020), there is a shortage of substantial Khmer-language content, no localized digital textbooks, and limited integration of AI or EdTech into teacher professional development programs. Nonetheless, Cambodia has shown significant policy impetus in boosting digital literacy. The draft Strategic Framework for Digital Education 2024-2028 promotes basic digital skills, digital citizenship, and equitable access to new technologies, such as artificial intelligence. (MoEYS, 2024). Public-private partnerships and NGO-led EdTech programs in Phnom Penh and select provinces provide ideal testing grounds for AI integration, particularly when accompanied by curriculum design and teacher coaching. ChatGPT's integration into learning environments can be understood through various theoretical perspectives.

Constructivist theory, grounded in the work of Vygotsky and Piaget, views students as active knowledge producers who benefit from scaffolded interactions. According to Bruner (1985), when used intelligently, ChatGPT can serve as a scaffold by offering rapid, supportive responses that build on learners' prior knowledge and encourage deeper study. Similarly, Bloom's Revised Taxonomy, Anderson and Krathwohl (2001), provides a useful framework, with ChatGPT aiding learning at all six cognitive stages, from recalling facts to developing creative original ideas. At lower levels, it assists with remembering and understanding concepts; at higher levels, it supports application, analysis, evaluation, and creation when used in essay writing, debate preparation, and critical inquiry tasks. The TAM (Davis, 1989) helps explain both teacher and student willingness to adopt AI tools based on perceived usefulness and ease of use. TAM stresses the need for training, user experience design, and cultural alignment to guarantee sustainable technology integration in settings like Cambodia, where digital literacy degrees vary greatly (Teo, 2011).

Methodology

Especially suitable for synthesizing several sources of knowledge spanning empirical and theoretical spheres, this synthesis uses an Integrative Thematic Review approach. Integrative reviews, according to Torraco (2005), let researchers combine results from several kinds of studies, quantitative, qualitative, conceptual, and empirical, into a cogent narrative, therefore enabling fresh viewpoints on a topic. When tackling difficult, multidisciplinary subjects like the instructional value of generative artificial intelligence technologies like ChatGPT, this approach is very helpful.

Focusing especially on Cambodian education, this review combines conceptual analyses and policy papers with global data from 2022 to early 2025. The review uses a thematic synthesis technique suggested by Thomas and Harden (2008), which entails line-by-line coding of included research, translation of concepts across studies, and the formation of analytical themes, thereby ensuring thematic depth. This work enables a significant classification of results into three basic domains important to the study's goals: student performance, learner perception, and growth in critical thinking. Further improving the analytical usefulness of this study is contextual alignment with Cambodian digital education reforms and Southeast Asian educational dynamics. Reliable grey literature on the educational uses of ChatGPT and peer-reviewed academic papers were identified through a methodical, thorough search. The review sought five main databases generally known for their coverage in education, technology, and social sciences to guarantee a broad and multidisciplinary scope. These databases comprised Google Scholar, Scopus, Web of Science, ERIC (Education Resources Information Centre), and JSTOR. Means of Boolean operators and structured keyword strings found relevant papers.

The main search phrases combined expressions *"ChatGPT"* OR *"large language models,"* AND *"education,"* OR *"learning performance,"* OR *"critical thinking,"* OR *"student perception,"* AND *"Cambodia,"* or *"Southeast Asia."* This method allowed studies specifically addressing the junction of generative artificial intelligence, pedagogy, and regional or national educational environments to be accessed. The search's temporal range was limited to January 2022 through March 2025, in line with the worldwide introduction and later acceptance of ChatGPT in late 2022 (OpenAI, 2023). Apart from keyword-based retrieval, citation tracking and backward reference list scanning were used to identify additional sources, especially those pertinent to Cambodia or other low- and middle-income countries (LMICs) in Southeast Asia.

This work employed well-defined inclusion and exclusion criteria to select pertinent literature, thereby maintaining analytical rigor and methodological transparency. The inclusion requirements were that all sources, conference proceedings, official education reports, and peer-reviewed journal articles must have undergone scholarly or institutional scrutiny. The research exclusively examined books authored in English, as ChatGPT was extensively utilised in educational institutions and other venues from 2022 to 2025. Articles about ChatGPTs or other GPT-based LLMs used in schools must be well-written. This uses conceptual frameworks, real-world research methods, and experimental, quasi-experimental, and observational studies to get a full picture of how the tool worked. This synthesis included studies on students in primary, secondary, and postsecondary education. Sources that did not meet the exclusion criteria were eliminated owing to insufficient scholarly proof or relevance. This includes blog posts, opinion articles, and casual comments that are poorly thought out and lack supporting evidence.

In addition, commercial white papers without transparent methodologies or peer validation were excluded due to concerns over bias and reliability. Studies concentrated only on non-AI-based educational technologies, such as conventional

ISSN 2349-4948

platforms like Zoom or Moodle, which fell beyond the purview of this AI-centered research, were also excluded from the evaluation. Finally, the review excluded papers that lacked significant analytical value or were unrelated to formal educational systems. Inspired by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework as described by Page et al. (2021), the screening and selection procedure was conducted. This respect for accepted review procedures improves the openness, credibility, and repeatability of the approach used in this work. The included studies were analysed through a thematic coding process that focused on three interrelated dimensions aligned with the research objectives: performance, perception, and cognition. The performance dimension assessed academic outcomes, including improvements in writing quality, comprehension, and problem-solving capacity. The perception dimension focuses on students' and instructors' attitudes toward ChatGPT, including trust in AI, motivations for change, and the tool's perceived value. The cognitive dimension examined how ChatGPT use affected critical thinking, metacognition, and reflective learning behaviors.

Each research was manually categorized using a qualitative data matrix, following the approach described by Braun and Clarke (2006). The coding approach began with identifying logical themes based on previous meta-analyses of AI in education (Kasneci et al., 2023; Wang & Fan, 2025). These themes were further improved and confirmed by iterative evaluation and comparison with national and regional education policy frameworks, such as the MoEYS ICT in Education Roadmap 2021-2025 and the draft Digital Education Strategy 2024-2028 (MoEYS, 2021, 2024). To frame the investigation within the larger Southeast Asian region, comparisons were made to educational developments in Vietnam, Thailand, and Indonesia. These comparisons were inspired by the ASEAN Secretariat's (2022) reports on digital education initiatives that provided insights into regionally shared potential and obstacles to AI adoption.

While this work provides vital insights into the burgeoning junction of ChatGPT and education, it has some methodological limitations that must be recognized. First, recent research and the rapid progress of AI technologies pose a challenge to long-term generalizability. Many studies are exploratory, and technology is always evolving; thus, conclusions may not represent longitudinal impacts or pedagogical sustainability (Borji, 2023). Second, the existing literature demonstrates a distinct geographical bias. A large share of research comes from high-income, technologically advanced countries such as the United States, Canada, South Korea, and EU member states. These contexts differ significantly from Cambodia in terms of digital infrastructure, AI preparedness, and teacher capability (Susnjak, 2024), so direct applicability is uncertain. Third, the review suffers from a lack of primary, locally sourced empirical data from Cambodian schools and classrooms. As a result, it cannot assess context-specific implementation dynamics or user experiences in real-time educational environments. The reliance on secondary data and policy texts restricts the interpretive depth of local nuances. Linguistic barriers and bias in publishing influence the review. Because only English-language materials were included, it is conceivable that research written in Khmer or other regional languages was inadvertently omitted. This means that local points of view that could

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have been useful were not included. **Table 1** illustrates that the integrative theme review technique is a useful way to develop strategies for appropriately introducing ChatGPT to Cambodia's schools, even though it has certain limitations.

Table 1. *Design and Analytical Framework*

Component	Description
Method and Type of Review	Bringing together research from the real world and ideas from diverse fields into a topic review (2022–2025). Synthesizes global findings with Cambodian contextual realities using thematic synthesis.
Thematic Focus Areas	Academic performance, perception, and cognition encompass critical thinking and metacognition.
Databases used	Google Scholar, Web of Science, Scopus, JSTOR, and ERIC.
Search Keywords	"*ChatGPT*" OR "*large language models*" AND "*education*" OR "*learning performance*" OR "*critical thinking*" OR "*student perception*" AND "*Cambodia*" OR "*Southeast Asia*".
Search Period	January 2022, March 2025, aligned with ChatGPT's release and adoption timeline.
Inclusion Criteria	Peer-reviewed articles, conference proceedings, and official reports in English (2022–2025); studies on ChatGPT in education; primary to tertiary level; conceptual and empirical research designs.
Exclusion Criteria	Non-empirical blog posts or commentaries; commercial white papers without methods; non-AI EdTech tools (e.g., Zoom); irrelevant or analytically weak studies.
Screening Protocol	Page et al. (2021) established guidelines to ensure clarity and reproducibility.

Finding and Discussion

The following discussion employs a thematic synthesis methodology to link international research findings with Cambodian educational policy objectives and

ISSN 2349-4948

sociocultural contexts. This section uses the integrative review methodology to examine the modifications necessary for ChatGPT, first developed and evaluated in resource-rich environments, to align with Cambodia's educational reform objectives. The glonacal technique, which examines how various factors affect educational practices, is used in the debate to investigate how generative AI technologies like ChatGPT could be employed in Cambodian classrooms. Kasneci et al. (2023) assert that a prominent finding in the global literature is that ChatGPT enhances student performance by providing immediate feedback, correcting errors, and facilitating personalized learning. In Cambodia, especially in the countryside, each pupil frequently has more than one teacher. Many students can access the one-on-one academic support they need through ChatGPT integration. ChatGPT could benefit pupils in an upper-secondary school in Cambodia who are writing stories in English by checking their grammar and vocabulary. This is not something that teachers who do not have a lot of time could do. However, remember that AI should not replace good instruction; it should only make it better. Teachers still have essential tasks, such as defining learning goals, grading student work, and placing AI-generated content in context.

ChatGPT could improve Cambodian classrooms for students by encouraging self-directed learning, student independence, and interest in technology. Studies show that students who use AI technology are more confident and motivated to finish their studies. (Fan et al., 2025; Woo & Choi, 2021). In the Cambodian context, this could be particularly impactful in bridging gaps between passive learning traditions and more inquiry-based, student-centered models. The integration of AI must be balanced with the preservation of human interaction in the classroom, especially in a society where respect for teacher authority is culturally significant. Blending AI support with traditional pedagogy can create hybrid models that foster both innovation and interpersonal learning. Some individuals argue that ChatGPT delivers shallow answers when you do not tell it what to do, but if you utilize it appropriately, it can help you think critically.

Teachers can use ChatGPT prompts to build up debates, problem-based projects, or scenario-based simulations to assist students in learning how to think critically, analyse information, and make decisions (Baidoo-Anu & Ansah, 2023). A tenth-grade civics teacher can have their students compare ChatGPT's answers to questions about historical political events with accounts from textbooks to discover how reliable and biased AI-generated material is. This kind of work helps people learn to use the media and reflect on their thinking, both of which are vital for learning in the 21st century. However, this requires explicit training for teachers in AI-supported pedagogy and prompt engineering to ensure depth rather than dependence.

ChatGPT has a lot of potential, but several ethical and institutional issues make it challenging to employ in Cambodian schools. A lot of rural school areas still do not have computer labs, fast internet, or teachers who know how to use the newest digital technologies. This shows that there is still a large divide in access to digital technology (UNDP, 2024). AI could make educational inequality worse rather than better if it is not appropriately supported. It is also necessary to address ethical issues such as

ISSN 2349-4948

algorithmic bias, data privacy, privacy threats, and academic plagiarism as soon as possible. Culture should also be significant.

ChatGPT does not have a Khmer-language interface or information tailored to its needs. Students in public schools who only speak one language cannot use it. If AI is not well set up, it could give humans culturally inappropriate information or perpetuate linguistic hierarchies. For ChatGPT to perform well in Cambodian schools, there will need to be robust national policy frameworks that encourage innovation while upholding morality and fairness. AI literacy should be part of the general education curriculum so that students learn to use, examine, and analyse AI technologies. Second, teacher training programs should include AI-integrated teaching approaches that foster quick reading, practical skills, and ethical awareness. With the help of in-service certification programs and peer mentorship networks, it may be possible to accelerate professional advancement. There needs to be clear regulations regarding how to protect data, what can and cannot be done with it, and how to hold people responsible. All interested parties, such as parents, instructors, students, and local EdTech providers, should have a say in these rules.

Conclusion and Future Directions

This scientific study argues that ChatGPT and other generative AI technologies could make education a lot better, especially when it comes to helping students think critically, do well in school, and feel good about themselves. The results also illustrate how vital it is to be open to new ideas, especially in countries with low or middle incomes like Cambodia. While global studies highlight measurable benefits in academic writing, cognitive engagement, and autonomous learning, the successful application of these insights in Cambodian classrooms hinges on localized implementation strategies that address infrastructural inequalities, digital literacy gaps, and cultural pedagogical norms. Balanced, context-sensitive integration of AI in education could catalyze a transformation of Cambodian learning environments, moving from passive, teacher-centered instruction to more student-driven, digitally enabled models. This transition requires careful management to ensure that AI is used for inclusive education rather than making things worse or forcing people to rely on technology.

The Ministry of Education, Youth, and Sport (MoEYS), schools, civil society organizations, and the corporate technology industry all have specific ideas on how to make the most of AI while reducing its risks. First, pilot programs need to be initiated across a wide range of schools, including public, private, rural, and urban schools. You can use these pilots to see how ChatGPT helps instructors do their jobs better, helps students learn, and makes the curriculum more logical in real Cambodian classrooms. They would also help gather local evidence to support bigger policy decisions. Second, the government should firmly support public-private partnerships (PPPs) to address infrastructure challenges and help expand Khmer AI content.

Collaboration with EdTech companies, local startups, and international donors can help supply internet connectivity, digital devices, and culturally appropriate AI models. Third, a significant investment in teacher professional development is required.

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Teachers must be equipped not only with technical skills to operate AI tools, but also with pedagogical frameworks for integrating these tools into student-centered instruction. Simultaneously, programs that build student digital skills, especially in critical AI literacy, media discernment, and ethical technology use, should be mainstreamed into both formal and non-formal education sectors. The current study provides a foundational synthesis of global findings and their relevance to Cambodia; nevertheless, additional empirical research is required to deepen understanding and guide the formulation of evidence-based policy. One crucial area is the need for longitudinal, classroom-based studies that examine the sustained effects of ChatGPT use on learning outcomes, classroom behavior, and teacher-student interaction in Cambodian schools. These studies should track changes over time and across different student demographics to identify patterns of benefit or exclusion. It is essential to develop and evaluate Khmer-language AI models to ensure that generative technologies can appropriately reflect and facilitate regional linguistic and cultural contexts.

Localized AI technologies can help make learning spaces more welcoming, especially in rural and monolingual areas where the present Khmer-language databases make it challenging for everyone to learn the same things. Finally, future research should explicitly expand the comparative ASEAN dimension. Cross-country studies that analyse AI education policy, digital equity, and EdTech adoption in nations such as Vietnam, Thailand, Indonesia, and the Philippines can provide valuable insights for Cambodia. For example, Vietnam is working to improve teachers' digital skills, and Thailand is trying to teach people how to use AI. These are two instances of how to adapt in other areas. These comparisons can help launch ASEAN-level talks and policy revisions on AI in education, thereby boosting Southeast Asia's overall digital progress.

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