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Advancing ChatGPT in Higher Education: Beyond Automation in Teaching Practices

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ABSTRACT

The emergence of generative Artificial Intelligence (AI) tools, such as ChatGPT, presents both opportunities and challenges for higher education. This study aims to promote ChatGPT usage at Chulalongkorn University, evaluate its impact on educational quality, and identify sustainable usage challenges and opportunities. Using a qualitative approach, data were gathered from 170 full-time faculty members through open-ended surveys and document analysis, utilizing thematic coding and the ADDIE framework. The findings reveal benefits such as enhanced personalized learning, improved content creation efficiency, and diverse applications across disciplines. AI stimulates critical discussions in Humanities and Social Sciences, facilitates clinical simulations in Health Sciences, and assists with coding in STEM. However, it also presents challenges such as ethical concerns, over-reliance on technology, and the need for critical verification skills. This study introduces a "Ladder Framework" for integrating AI into higher education, offering strategies to enhance teacher education and foster dialogue on AI's role in the diverse ASEAN educational landscape.

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Introduction

The integration of Artificial Intelligence (AI) into education, commonly known as AIEd, is transforming higher education globally (Zhang & Aslan, 2021). Among emerging tools, generative AI models, such as ChatGPT, have attracted significant attention for their ability to enhance personalized learning, automate feedback, and support content creation (Ching et al., 2024). With advanced natural language processing, ChatGPT has shown promise as a personalized assistant, facilitating instructional design and streamlining educational processes (Allam et al., 2023; Bhullar et al., 2024).

Teachers worldwide are leveraging ChatGPT to develop syllabi, lesson plans, and assignment feedback, generating optimism about its role in improving learning outcomes (Hays et al., 2024). However, its rapid adoption also brings concerns about academic integrity, misinformation, and digital overdependence (Fütterer et al., 2023). While AI offers adaptive learning and automates routine tasks, freeing educators to focus on meaningful interactions, it may also undermine critical thinking and problem-solving skills if misused (Royer, 2024; Oster et al., 2024). Further concerns include digital literacy gaps, distraction, and ethical risks (Samala et al., 2024). Thus, the effective use of ChatGPT necessitates careful ethical, pedagogical, and practical consideration.

In Thailand, Chulalongkorn University has emerged as a leader in AI integration (Chulalongkorn University, 2023). Yet, disparities in adoption remain across other institutions, revealing a need for research into the broader implementation of tools like ChatGPT. Challenges such as institutional inertia and a lack of digital infrastructure complicate AI integration (Korseberg & Elken, 2024). While Chulalongkorn's approach offers valuable insights, deeper analysis is required to understand ChatGPT's role across disciplines and instructional design stages, especially in relation to educational quality and institutional readiness.

Existing studies often emphasize ChatGPT's automation functions, but comprehensive research is needed on its strategic integration within teaching and learning. Key research priorities include assessing its pedagogical impact, identifying implementation challenges, and developing ethical best practices for instructional design.

This study explores the transformative potential of ChatGPT in higher education through a case study at Chulalongkorn University, using the ADDIE model—Analysis, Design, Development, Implementation, and Evaluation—as a guiding framework (Adeoye et al., 2024). Although traditionally linear, ADDIE aligns with the iterative nature of AI adoption in education (Spatioti et al., 2022). This research evaluates ChatGPT's application across instructional phases, its influence on teaching practices and learning outcomes, and the ethical dimensions of its use. The goal is to propose a context-sensitive framework for effective AI integration that supports educational excellence, particularly within the ASEAN context, emphasizing strategic alignment, ethical awareness, and continuous

innovation.

Literature Review

The integration of generative AI, particularly ChatGPT, is reshaping higher education globally but faces ASEAN-specific challenges in infrastructure, policy readiness, and faculty preparedness (El-Seoud et al., 2023; Gill et al., 2024). Many Western universities are currently exploring methods for integrating ChatGPT into their curricula and tutoring systems. However, they are encountering a range of pedagogical and ethical challenges during the process (Mogavi et al., 2024). In contrast, institutions in the ASEAN region continue to face difficulties such as unequal access to digital resources, limited AI literacy, and fragmented policy frameworks (Ngo, 2023; Rasul et al., 2023). Recent international initiatives—such as the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Guidance for Generative AI in Education and Research (UNESCO, 2023) and the Asia-Europe Foundation (ASEF) White Paper for Universities: Navigating Artificial Intelligence Innovation Ecosystems (Asia-Europe Foundation, 2025)—offer valuable guidance for effectively incorporating AI into educational contexts. AI has evolved from rule-based systems to conversational, context-aware models enabling complex problem-solving and creative generation (Hatmanto & Sari, 2024; Isiaku et al., 2024), bringing both autonomy and risks such as misinformation and academic integrity breaches (El-Seoud et al., 2023). Barriers include rural internet gaps, device access disparities, lack of governance frameworks, and insufficient faculty training (Chatburagohain & Chaudhary, 2025; Ngo, 2023), alongside the need to embed AI literacy and ethics into teacher education (Le & Wan Ahmad, 2024). While AI can enhance cross-border collaboration and teaching quality (Maspul, 2025), without coordinated policies and equitable investment, digital divides may widen. Western institutions lead with proactive governance and large-scale AI initiatives (Christ-Brendemühl, 2024; Gill et al., 2024), whereas ASEAN adoption is often experimental and driven by faculty (Ngo, 2023). Country trends include: The Philippines—university-led discussions on responsible integration, pedagogical adaptation, and academic integrity concerns amid uneven digital access (Buragohain & Chaudhary, 2025); (Chatburagohain & Chaudhary, 2025); Indonesia—language and research use with readiness concerns (Hatmanto, 2024; Maspul, 2025); Vietnam—translation support with over-reliance risks (Mai Thi Truc Le, 2024); Malaysia—blended learning under national policy yet privacy issues (Buragohain & Chaudhary, 2025); Singapore/Malaysia—bilingual and inclusive STEM (Buragohain & Chaudhary, 2025).

Overall, ChatGPT use in the ASEAN region focuses on language learning, teacher development, and research but remains constrained by infrastructural and policy gaps (Maspul, 2025). This study evaluates the early adoption of ChatGPT at Chulalongkorn University, assessing its potential, challenges, and strategies for enhancing educational excellence and informing regional AI policy alignment.

Research Questions/Objectives

The goal of this study is to explore and critically evaluate the integration of ChatGPT into higher education at Chulalongkorn University, with a focus on its potential to enhance teaching practices, improve educational outcomes,

and inform future strategies for AI adoption in academic contexts. The analysis focuses on three key areas: (1) Enhancing ChatGPT utilization—evaluating its effectiveness across instructional design phases and academic disciplines; (2) Assessing educational impact—examining its influence on student learning outcomes, teaching effectiveness, and alignment with institutional goals; and (3) Identifying challenges and opportunities—exploring the technological, pedagogical, and ethical issues related to ChatGPT adoption, as well as areas for innovation.

Methodology

This study employed a qualitative exploratory research design to investigate faculty experiences with integrating ChatGPT into university-level instruction. The design combined open-ended survey responses with document analysis, enabling a multi-layered understanding of instructional practices across disciplines. This mixed qualitative approach supported methodological triangulation and enhanced the credibility of the findings. Purposive sampling was used to recruit faculty members from Chulalongkorn University who expressed interest in integrating ChatGPT into their teaching. Eligibility criteria required participants to (a) hold a faculty position, (b) incorporate ChatGPT into at least one course during the August–December 2023 semester, and (c) provide informed consent. As ChatGPT was newly introduced as a pedagogical tool, all participants engaged with it as early adopters—navigating its opportunities and challenges within a largely unfamiliar educational context.

Focusing on early adopters yielded rich insights into the initial stages of AI integration. However, this also introduced self-selection bias, as participants were predisposed to experimentation. Their perspectives may have overrepresented perceived benefits and underrepresented barriers experienced by more cautious faculty members.

A total of 170 faculty members implemented ChatGPT in 202 courses, spanning diverse disciplines:

- Social Sciences and Humanities: 96 courses
- Health Sciences: 38 courses
- Sciences and Technology: 57 courses
- Other centers/institutes/colleges: 11 courses

These disciplinary groupings followed the university's internal classification system, with "Other" referring to multidisciplinary academic units outside traditional faculties. Participant distribution mirrored this: Social Sciences and Humanities (n = 59, 35%), Health Sciences (n = 48, 28%), Sciences and Technology (n = 48, 28%), and other centers (n = 15, 9%). All participants were granted access to ChatGPT (GPT-4) and encouraged to explore its instructional use.

Data were collected from March–July 2024 via an open-ended survey distributed through Google Forms. The survey captured participants' experiences, perceived benefits and challenges, and integration strategies. Reports were obtained from 170 of 180 registered participants, resulting in a 94.4% submission rate. A non-response analysis of the 10 missing reports (5.6%) revealed that 7 participants requested refunds, 2 were unresponsive, and 1 did not submit by the closure date. To contextualize the findings, document analysis

was conducted, including the review of course syllabi, lesson plans, institutional reports, and relevant AI policies.

Although students were not directly surveyed, faculty were prompted to reflect on observed student engagement, outcomes, and learning experiences with ChatGPT. Structured reflections—submitted through Google Forms and supported by instructional slides—detailed the teaching context, challenges, ChatGPT use, and outcomes. These reflections encompassed qualitative descriptions and anecdotal evidence from undergraduate to doctoral levels. Thus, student-related insights represented faculty-reported observations, not direct student feedback.

Data were analyzed using thematic coding to identify recurring patterns. The ADDIE model served as a conceptual lens for mapping ChatGPT's integration into the instructional design process:

- Analysis: ChatGPT aided in reviewing learner profiles and identifying instructional needs.
- Design: Supported the development of lesson plans and learning activities.
- Development: Facilitated the creation of instructional materials (e.g., quizzes, multimedia content).
- Implementation: ChatGPT-enhanced materials were deployed across 202 courses.
- Evaluation: Faculty reflections and student-related feedback informed the assessment of effectiveness.

Often viewed as linear, ADDIE was applied in this study as a cyclical and iterative model, aligning with the dynamic nature of AI integration. However, data collection occurred only once—via an end-of-semester survey—offering a summative view rather than continuous feedback. This one-time assessment nonetheless provided foundational insights for future, more adaptive implementation.

The study employed methodological triangulation, drawing from multiple data sources—survey responses, instructional slide submissions, and teaching-related documents—to enhance the credibility and trustworthiness of the findings. This cross-verification enabled a more comprehensive understanding of how ChatGPT could be integrated into teaching practices across disciplines.

Results and Discussion

ChatGPT Integration in the ADDIE Framework

The integration of ChatGPT across various educational contexts at Chulalongkorn University provided meaningful contributions at each stage of the ADDIE instructional design model. These contributions highlight ChatGPT's capacity to enhance learner-centered practices, instructional innovation, and pedagogical effectiveness.

In the analysis phase, ChatGPT supported learner-centric design by analyzing learner data, identifying misconceptions, and recommending tailored strategies. For instance, in the "Statistics and Information in Education" course, ChatGPT was used to review survey responses and propose context-specific solutions. Its ability to monitor progress, detect learning patterns, and offer real-time feedback

Table 1

ChatGPT Integration in the ADDIE Framework

ADDIE Framework	Best Practices	ChatGPT Role	Examples or Quotes
Analysis	Founding the Learner-Centric Design	Analyze learner data, provide recommendations, monitor progress, and evaluate assignments	Utilize ChatGPT to analyze learner data and present alternative solutions or approaches to address student problems
Design	Crafting the AI-Infused Blueprint	Develop course outlines, generate lesson plans, and create adaptive learning pathways	Use ChatGPT to help design classroom activities in courses such as Halal Food Production and Machine Learning Principles
Development	Breathing Life into the Design	Optimize content generation, create quizzes, and develop interactive learning materials	ChatGPT acts as a co-pilot in creating visually appealing and informative presentation slides
Implementation	Navigating the AI-Augmented Classroom	Facilitate group work, promote collaboration, provide real-time feedback, and create adaptive learning environments	Teach students how to use ChatGPT to solve problems in courses such as the Health Care System
Evaluation	Assessing the Impact of AI on Learning	Create diverse assessment tools, assess the impact through feedback and data, provide timely personalized feedback, and analyze performance trends	ChatGPT creates diverse assessment tools, including quizzes, reflective exercises, and examinations, while providing timely feedback to students in Community Pharmacy, Chemical Process Safety, Entrepreneurship for Sustainable Fuels, and Foundation of Education courses

reinforced its role in data-driven instructional planning (see Table 1).

During the design phase, ChatGPT contributed to developing instructional blueprints, lesson plans, and activities aligning with intended learning outcomes. It enabled adaptive learning pathways to accommodate diverse learner needs. In courses such as "General Principles in Halal Food Production," it was instrumental in aligning content with pedagogical goals. Moreover, ChatGPT facilitated the design of new courses focusing on teacher competencies, showcasing its value in curriculum innovation.

In the development phase, ChatGPT served as a co-creator, optimizing content generation and refining instructional materials. It assisted with editing, quiz creation, and presentation design, enriching learning materials across disciplines. For example, in Food and Drug Technology courses, ChatGPT helped produce interactive exercises aligning with learning objectives. It also enabled authentic learning through the generation of project simulations and proposal drafts, enhancing instructional quality and student engagement.

During the implementation phase, ChatGPT's classroom use emphasized ethical integration, promotion of collaboration, and enhancement of digital literacy. Faculties reported using ChatGPT to stimulate discussion, provide real-time assistance, and personalize instruction.

Table 2

ChatGPT Integration Across Different Academic Fields

Fields	Depth of Integration	Student Engagement	Pedagogical Approaches
Social Sciences and Humanities	● Generates discussion prompts ● Supports creative projects ● Improves language skills ● Focuses on critical thinking and communication	● Active learning ● Increases participation in class	● Inquiry-based learning ● Encourages questions and exploration ● Provides personalized feedback
Health Sciences	● Creates interactive case studies ● Simulates clinical practice ● Acts as a virtual patient	● Real-life clinical simulations ● Enhances engagement through practical experiences	● Problem-based learning ● Presents complex cases ● Develops solutions through knowledge application
Sciences and Technology	● Supports coding tasks ● Assists with data analysis ● Creates visualizations ● Helps solve technical problems	● Supplementary tool for research ● Enhances individual learning	● Inquiry-based learning ● Personalized technical problem-solving
Other Centers, Institutes, and Colleges	● Varying roles across institutions ● From administrative support to research assistance	● Engagement varies based on the use case ● Administrative and learning facilitation	● Flexible, context-driven approaches ● Adapts to both instruction and research

One faculty member from the Health Care System course noted: “Teach students how to use ChatGPT to solve problems,”—reflecting its adoption as a learning facilitator. By encouraging students to engage with AI critically, ChatGPT contributed to adaptive and responsive learning environments.

Commonalities and Differences Across Fields

The integration of ChatGPT across academic disciplines revealed both shared practices and field-specific applications. Insights were drawn from an in-depth analysis of its use in Social Sciences and Humanities, Health Sciences, Sciences and Technology, and other academic units (see Table 2).

Across all fields, ChatGPT contributed significantly to curriculum design by assisting with the creation of summaries, visual aids, and engaging assessments. Its ability to streamline content development enabled educators to allocate more time to instructional quality and student interaction. Language support—particularly in translation and paraphrasing—proved valuable for enhancing accessibility and cross-cultural communication. Additionally, ChatGPT supported personalized learning by adapting outputs to varied learning styles and levels of proficiency.

- Social Sciences and Humanities: ChatGPT-enhanced critical thinking and communication through its support for dialogic learning, student-led inquiry, and creative project development. It was particularly effective in facilitating discussions and encouraging the exploration of diverse perspectives.

- Health Sciences: The tool enabled the design of interactive case studies and simulated clinical scenarios, fostering the application of theoretical knowledge in practice-based settings. It supported problem-based learning, promoting diagnostic reasoning and collaborative problem-solving.
- Sciences and Technology: ChatGPT was employed for code generation, data analysis, and literature exploration. It assisted in scripting, debugging, and homework verification, supporting computational thinking and technical accuracy in instruction.
- Other Centers, Institutes, and Colleges: In multidisciplinary and administrative contexts, ChatGPT supported research preparation, content summarization, and tailored administrative tasks, indicating its flexibility across non-traditional instructional settings.

Impact on ChatGPT Integration

At Chulalongkorn University, the integration of ChatGPT significantly enhanced teaching practices and student learning experiences. Faculty members reported improvements in student understanding, engagement, and skill development across disciplines. ChatGPT enabled personalized feedback, supported diverse assessment formats, and facilitated deeper engagement with complex content. From an instructional perspective, it reduced administrative burdens, improved feedback quality, and allowed educators to focus on higher-order pedagogical tasks.

Its adaptability aligned with the university's strategic emphasis on innovation

Table 3

Faculty-Reported Student Use, Outcomes, and Limitations of ChatGPT

Fields	Key Uses	Student Outcomes	Limitations
Social Sciences and Humanities	Teaching principles of ethical AI use; brainstorming; content creation; administrative drafting; research assistance with literature review	Increased engagement, creativity, and critical thinking; better understanding of ethical use; enhanced discussion quality	Risk of over-reliance; possible plagiarism; cultural mismatch in AI-generated text
Health Sciences	Clinical case generation; medical writing support; multilingual translation; improving patient communication; generating exam questions	Improved diagnostic reasoning; better understanding of complex concepts; increased confidence in practical applications	Inaccuracy in specialized content; risk of misunderstanding AI-generated medical advice
Sciences and Technology	Coding support; statistical analysis guidance; problem generation; engineering simulations; language editing for publications	Enhanced programming and analytical skills; improved problem-solving; exposure to diverse solutions	Errors in technical accuracy; need for precise prompts; limited specialized plugin availability
Other Centers, Institutes, and Colleges	Research assistance; content generation for publications; data table/image creation; summarization; cross-lingual text revision	Better understanding of interdisciplinary concepts; faster comprehension of complex ideas; improved academic writing	Possible factual inaccuracies; hallucination of references; need for expert verification

and digital transformation, while its ability to provide accessible, real-time explanations contributed to greater inclusivity in learning.

Insights into ChatGPT's educational impact were derived from 170 faculty participants who reflected on their use of the tool across 202 courses at undergraduate, postgraduate, and doctoral levels. Although students were not directly surveyed, faculty members provided structured reflections—including survey responses and teaching documentation—offering valuable accounts of student interaction with ChatGPT as a supplementary learning tool (see Table 3).

Disciplinary Perspectives

- Social Sciences and Humanities: Faculty members observed increased student engagement, particularly in brainstorming and essay writing. ChatGPT encouraged expression and critical dialogue, though concerns were raised about over-reliance and potential plagiarism.
- Health Sciences: Instructors used ChatGPT to create clinical scenarios and simplify complex medical concepts. However, they emphasized the need for careful validation of AI-generated content, particularly in high-stakes or technical contexts.
- Sciences and Technology: ChatGPT was widely used for coding support, data analysis, and computational tasks. While students benefited from these applications, instructors noted limitations such as technical inaccuracies and the necessity for precise prompt engineering.
- Other Centers, Institutes, and Colleges: Across various fields, faculty members acknowledged that ChatGPT has boosted productivity, engagement, and learning outcomes. However, effective use demanded strong verification skills and critical thinking to ensure responsible and ethical engagement with AI-generated content. The integration thus underscored the dual imperative of technological fluency and academic integrity in contemporary higher education.

AI Challenges and Future Prospects

While ChatGPT has improved instructional efficiency and student engagement across disciplines, its integration at Chulalongkorn University revealed several challenges and opportunities. Faculty members emphasized that effective use requires mindful implementation, critical oversight, and a strong ethical framework to mitigate issues such as superficial understanding, over-reliance, and inaccuracies. When used responsibly, however, ChatGPT can support authentic, adaptive, and equitable learning environments.

- Technological and Infrastructure Challenges: Persistent technical barriers—including unstable internet connections, hardware limitations, and format incompatibility—impacted ChatGPT's effectiveness, particularly in disciplines relying on external digital content. In response, the university is upgrading its infrastructure and exploring broader system integrations to improve usability for both faculty members and students.

- Policy and Ethical Considerations: Concerns around data privacy, information security, and academic integrity were widely reported. As ChatGPT processes potentially sensitive information, institutions must establish clear guidelines to ensure ethical and regulatory compliance. The risk of plagiarism and misinformation highlights the need for university-wide policies and training programs focusing on ethical AI integration.
- Pedagogical Concerns: Faculty reflections revealed challenges related to reluctance—among both educators and students—to adopt AI tools. This underscores the need for ongoing professional development and awareness-building initiatives. Additionally, concerns about diminished student originality suggest the necessity for rethinking assessment design to foster independent thinking, creativity, and higher-order cognitive skills.

Maintaining human-centered learning was identified as a core priority. While ChatGPT can personalize feedback and support language learning, it must complement—rather than replace—the educator's role. This is particularly critical in culturally sensitive fields, such as language instruction and the social sciences, where decontextualized or biased AI responses could disrupt learning.

To address the ethical challenges associated with ChatGPT integration, institutions should develop comprehensive AI usage policies that encompass data protection and academic integrity protocols. It is essential to incorporate AI ethics into both faculty and student training programs, with a focus on key topics such as bias recognition, content verification, proper attribution, and the limitations of AI-generated outputs. Embedding these elements into broader digital literacy curricula can foster a culture of ethical and informed AI use, ensuring responsible adoption and minimizing potential misuse in higher education contexts.

Despite these challenges, ChatGPT holds strong potential to transform higher education. For faculty members, it fosters pedagogical innovation; for students, it enables flexible and personalized learning; and for institutions, it advances strategic digital transformation. As one participant observed, "A training program in Prompt Engineering for Generative AI tools would benefit everyone." Moving forward, success will depend on inclusive policy development, stakeholder-specific support, and investment in AI literacy.

Discussion

The integration of ChatGPT at Chulalongkorn University underscores the transformative potential of AI in higher education, offering practical insights into its pedagogical benefits and institutional challenges across disciplines. Based on the study's findings and aligning with regional literature, several strategic directions emerge for ASEAN educators: embedding AI literacy, critical thinking, and ethics across curricula; providing ongoing faculty development in AI pedagogy and assessment; investing in digital infrastructure to reduce urban–rural disparities; and establishing multi-level policy frameworks that safeguard data privacy and guide ethical AI use (Buragohain & Chaudhary, 2025; Le & Wan Ahmad, 2024; Ngo, 2023). These strategies must account for

socio-cultural and technological diversity in ASEAN to ensure equitable implementation. At Chulalongkorn, ChatGPT has not only revolutionized instruction but also enhanced personalization, engagement, and inclusivity—particularly in Health Sciences, Social Sciences, and Technology—by tailoring content to learners' needs (Hsu & Ching, 2023a; Jukiewicz, 2024; Tlili et al., 2023). Its role in supporting critical inquiry was evident in courses such as Buddhist Teaching in the Pali Canon, where it facilitated diverse perspectives and independent thinking (Royer, 2024). However, sustaining a human-centered learning environment remains essential. This study advocates a co-pilot model, where educators guide students in using ChatGPT for brainstorming, drafting, and feedback while retaining control over instructional goals, accuracy, and assessment. This approach emphasizes that AI should augment, not replace, human expertise. Incorporating AI literacy modules and prompt engineering workshops into faculty development can further support thoughtful adoption, ensuring pedagogical integrity and fostering student agency in AI-enhanced learning environments.

Implications

The findings of this study indicate that ChatGPT aligns with key pedagogical frameworks, underscoring its adaptability in higher education. From a constructivist view (Piaget, 1972), it promotes active learning through co-created knowledge and problem-solving, especially in the Social Sciences and Humanities. Guided by socio-cultural learning theory (Vygotsky, 1978), it functions as a scaffold in Health Sciences and STEM, simplifying complex concepts. Through a behaviorist lens (Skinner, 1954), it delivers instant, personalized feedback to reinforce learning behaviors. Consistent with connectivism (Siemens, 2005), it facilitates the synthesis of

Figure 1

Ladder Framework for Advancing ChatGPT in Higher Education

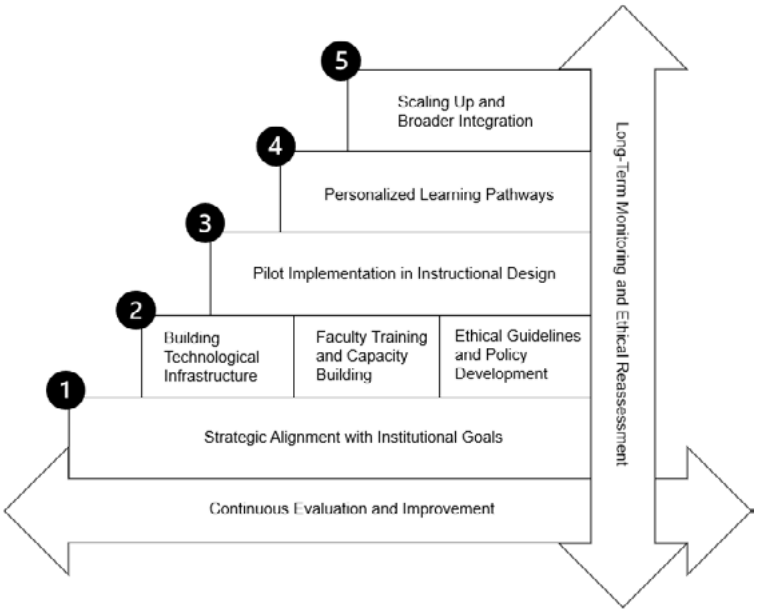

Figure 2

The AI Competency Framework High-level Structure: Aspects and Progression Levels (UNESCO, 2024)

Aspects	Progression		
	Acquire	Deepen	Create
1. Human-centred mindset	Human agency	Human accountability	Social responsibility
2. Ethics of AI	Ethical principles	Safe and responsible use	Co-creating ethical rules
3. AI foundations and applications	Basic AI techniques and applications	Application skills	Creating with AI
4. AI pedagogy	AI-assisted teaching	AI–pedagogy integration	AI-enhanced pedagogical transformation
5. AI for professional development	AI enabling lifelong professional learning	AI to enhance organizational learning	AI to support professional transformation

diverse information, linking academic and real-world contexts. Overall, ChatGPT acts as a strategic pedagogical mediator with significant potential for higher education in ASEAN when used ethically and purposefully.

Based on the study's findings, the "Ladder Framework for Advancing ChatGPT in Higher Education," as shown in Figure 1, is proposed to guide the ethical and effective integration of ChatGPT into higher education, particularly in instructional design. The framework consists of five key steps.

1. **Strategic Alignment with Institutional Goals:** Define AI's role in relation to educational missions, ensuring stakeholder involvement from the outset.
2. **Technological Infrastructure and Capacity Building:** Establish a robust digital foundation, offer structured faculty development, and develop institutional policies for ethical AI integration.
3. **Pilot Implementation in Instructional Design:** Apply ChatGPT to selected courses across disciplines, collect feedback, and refine integration strategies.
4. **Personalized Learning Pathways:** Use ChatGPT to support adaptive learning, provide timely feedback, and personalize instruction based on learners' needs.
5. **Scaling Up and Broader Integration:** Expand implementation across faculties and programs, promoting sustainable AI adoption in teaching and learning.

Each step is supported by continuous evaluation and long-term ethical monitoring, allowing institutions to respond to evolving needs and AI developments.

To enhance the framework's legitimacy, it has been explicitly anchored in UNESCO's AI Competency Framework for Teachers (2024), which emphasizes a human-centered mindset, ethical usage, and AI literacy in application, pedagogy, and professional development. The Ladder Framework's innovative contribution lies in its practical, stage-based approach tailored to Southeast Asian higher education contexts, distinguishing it from abstract global models.

Furthermore, operational indicators have been identified for progression between stages, including institutional readiness assessments, faculty AI competency benchmarks, and documented evidence of instructional innovation. This scaffolding approach provides concrete guidance to educators and policymakers seeking to adopt generative AI tools responsibly.

While acknowledging ChatGPT's promise, this study also addresses the ethical considerations central to responsible AI use, including data privacy, academic integrity, and potential bias in AI outputs (Holmes et al., 2019). Institutions must balance the benefits of automation with preserving human agency and relational pedagogy, especially in disciplines requiring cultural sensitivity, emotional intelligence, or interpretive nuance.

Emerging AI innovations—such as intelligent tutoring systems and generative assessment—further affirm ChatGPT's relevance in fostering personalized and scalable learning solutions (Allam et al., 2023; Koh & Doroudi, 2023). With appropriate safeguards, training, and strategic vision, universities across the ASEAN region and beyond can harness ChatGPT to enhance teaching effectiveness, elevate learning outcomes, and promote inclusive, ethical digital transformation (Dwivedi et al., 2023; Jeon & Lee, 2023).

Conclusion

The integration of ChatGPT at Chulalongkorn University offers grounded evidence of how generative AI can transform teaching and learning in higher education, especially within the diverse and evolving landscape of ASEAN. Drawing on authentic insights from 170 faculty members across disciplines, this study moves beyond aspirational discourse to present practical, evidence-based pathways for AI adoption.

The proposed Ladder Framework for Advancing ChatGPT in Higher Education synthesizes institutional priorities, pedagogical strategies, and ethical safeguards into a scalable model. This framework addresses a notable gap in the literature by offering an operational tool to guide AI integration from pilot implementation to broad institutional adoption, grounded in the realities of Southeast Asian educational contexts.

The study findings show that ChatGPT enhances instructional effectiveness by supporting lesson design, multilingual learning, assessment variety, and real-time feedback. These benefits are particularly salient for teacher education in the region, aligning with ASEAN goals such as harmonizing professional standards, promoting AI literacy, and fostering inclusive pedagogy across borders.

At the same time, the study surfaces persistent challenges—including an uneven digital infrastructure, fragmented AI policies, and ethical uncertainties—that require institutional and policy-level responses. Addressing these

challenges through capacity building, faculty development, and regional policy coordination is essential for sustainable AI integration.

By anchoring its findings in both global frameworks and local realities, this study contributes new knowledge on the strategic, ethical, and contextual dimensions of AI in higher education. Rather than displacing educators, ChatGPT should be understood as a tool to amplify human-centered pedagogy, foster innovation, and equip both current and future educators to navigate the digital future with confidence and integrity.

Limitations and Recommendations

This study has several limitations that should be acknowledged. Firstly, while methodological triangulation enhanced the credibility of the findings, the data were collected at a single point in time. This approach may not capture the evolving nature of teaching practices or the long-term impacts of ChatGPT integration in higher education. Future research should consider longitudinal or multi-phase designs to track changes over time and assess the sustained pedagogical effects.

Secondly, the study is subject to self-selection bias, as participation was voluntary and may have attracted faculty members who were already interested or experienced in AI-enhanced teaching. This could limit the generalizability of the findings. Broader sampling strategies, including purposive or randomized recruitment across institutions, are recommended for future studies to ensure more representative insights.

Thirdly, the rapid pace of AI development presents a challenge for maintaining up-to-date research findings. ChatGPT and similar tools are continuously evolving in terms of capabilities, accessibility, and ethical implications. As such, the insights presented here may require regular re-evaluation. Ongoing studies should account for version changes, policy updates, and emerging instructional use cases to ensure relevance.

Collectively, these limitations highlight the need for continued research that is iterative, inclusive, and responsive to the dynamic landscape of AI in education. Future work should explore student perspectives directly, examine disciplinary variations in adoption, and develop institutional frameworks that support ethical, effective, and context-sensitive AI integration.

Finally, future research should ignite the passion for systematically training pre-service teachers to seamlessly integrate generative AI tools such as ChatGPT into their instructional design, classroom facilitation, and assessment. By cultivating AI literacy, ethical awareness, and prompt engineering skills, future educators can be empowered to wield AI responsibly and effectively, transforming teaching practices for generations to come.

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4. **Ethical Approval:** Based on the nature of the research involving minimal risk and non-identifiable data collected from adult participants, the requirement for formal ethical approval was waived. The research adhered to institutional guidelines for the responsible conduct of research and respected participant confidentiality throughout the study.

5. **Declaration of Generative AI in Scientific Writing**
   During the preparation of this work, the authors used ChatGPT (OpenAI) to assist with language refinement, sentence restructuring, and clarity enhancement. Additionally, Grammarly was used for grammar and spelling correction. After using these tools, the authors carefully reviewed and edited all content to ensure factual accuracy, coherence, and alignment with the intended scholarly message. The authors take full responsibility for the final version of the manuscript and its academic integrity.

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