

Navigating the Generative Artificial Intelligence Era

Charting the Course for Curricular Reform
in Higher Education in the Philippines

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UP CIDS | MONOGRAPH SERIES | 2024-06

is published by the

**University of the Philippines
Center for Integrative and Development Studies**

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ISSN 2719-0722 (Print)
ISSN 2719-0730 (Online)

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UP PRESIDENT
EDGARDO J. ANGARA
FELLOWSHIP

The **UP President Edgardo J. Angara (UPPEJA) Fellowship** is a grant for pioneering policy research. It aims to promote high-level policy discussions and research on a wide range of topics that address national development goals and imperatives, such as science and technology, economic development, environment and climate change, good governance, and communications.

The Fellowship was established by the University of the Philippines Board of Regents on September 29, 2008 in honor of the late Senator Edgardo J. Angara, who served as UP President from 1981 to 1987 and concurrent UP Diliman Chancellor from 1982 to 1983.

Angara, also a former Senate President, is known for his contributions to Philippine education, serving as the Chairperson of the First Congressional Commission on Education in 1990, which was credited with a number of pioneering reforms in the education sector, including its “trifocalization” and the Free Higher Education Act.

In addition to his notable contributions as a legislator, Angara’s leadership also gave rise to the **UP Center for Integrative and Development Studies (CIDS)**, which he initiated during his presidency.

Officially established on June 13, 1985, and originally called the University Center for Strategic and Development Studies (UCSDS), CIDS serves as a think tank that leverages the multidisciplinary expertise of UP to address the nation's most pressing challenges. The core objectives of CIDS encompass the development, organization, and management of research on national significance, the promotion of research and study among various university units and individual scholars, the securing of funding from both public and private sources, and the publication and wide dissemination of research outputs and recommendations.

For 2024, the Higher Education Research and Policy Reform Program (HERPRP) served as the UP PEJA Fellowship Awards secretariat in partnership with the Second Congressional Commission on Education (EDCOM II).

From the Executive Director of UP CIDS

It has been a long time in the making, but I am pleased to see the UP PEJA Fellowship finally coming to fruition. After all the forums, meetings, presentations, and threads of communication between and among the PEJA Fellows, UP CIDS' Higher Education Research and Policy Reform Program (HERPRP), and the Second Congressional Committee on Education (EDCOM 2), we now have a series of papers that tackle the various facets of Philippine higher education. The series includes the study you're reading.

For much of its history, the UP PEJA Fellowship has been housed in and implemented through the Center for Integrative and Development Studies (CIDS), the University of the Philippines' policy research unit. Over the years, the Fellowship has funded and published the studies of policy scholars, many of them luminaries in their respective fields.

In 2023, after a few years' hiatus, not least because of the COVID-19 pandemic, the UP PEJA Fellowship resumed and began looking for a new set of Fellows. This time, however, UP CIDS, through its Higher Education Research program, embarked on a historic partnership with the Second Congressional Committee on Education (EDCOM 2).

Linking directly with the government in administering the UP PEJA Fellowship was a first for UP CIDS. And that this was a partnership with a national-level policy-making body made it even more special.

As I have always maintained, this type of linkage is exactly what UP CIDS, as a policy research unit, must do: embedding research within a framework of stakeholder engagement.

Guided by the policy objectives of EDCOM 2, the PEJA papers not only tackle the complex issues in education, but also show stakeholders – the state, civil society, and the teachers themselves – how we can tackle them. For all our efforts in improving education in the Philippines, what else can and should we do?

Many thanks to the PEJA fellows for their valuable contribution, and to the UP CIDS Higher Education Research Program for shepherding this important undertaking. With collaboration, great things do happen.

Rosalie A. Hall, PhD

Executive Director

UP Center for Integrative and Development Studies

From the Convenor of UP CIDS-HERPRP

We at the Higher Education Research and Policy Reform Program serve as a convening body that builds partnerships and networks that pursue a shared research agenda and build an evidence basis for policy. Our activities include fellowships for scholars who publish with us and consultancies for junior researchers who wish to begin a career in higher education studies. We maintain databases, conduct events, and publish various manuscripts on higher education.

For 2024, our full attention was devoted to the UP PEJA Fellowship Program, serving as a secretariat for the researchers who studied higher education as it intersected with government and finance, industry and agriculture, regulation and tuition and technical and vocational education, training and lifelong learning, the UP PEJA Program awards grants for pioneering work on a wide range of topics that address national development concerns. This was the very first time that the program focused on a singular topic. This demonstrates the commitment of the University of the Philippines to higher education.

With the support of the UP Foundation, we have assembled what we have been calling the *Avengers* of Philippine education. They are preeminent scholars whose findings and recommendations directly address key policy concerns. Their papers at once draw from empirical data as well as their professional expertise for which they have been identified as a UP PEJA fellow.

Fernando dIc. Paragas, PhD

Convenor

Higher Education Research and Policy Program

UP Center for Integrative and Development Studies

Letter from the Executive Director of EDCOM II

The **Second Congressional Commission on Education (EDCOM II)** is collaborating with scholars across various institutions to provide valuable insights for the development of evidence-based policies that address the unique challenges and opportunities in the Philippine education landscape.

Our commitment to excellence, integrity, and ethical conduct in advancing research and disseminating knowledge, which we share with our research partners, is defined by the following principles:

The Commission is dedicated to upholding the highest standards of academic rigor in the evaluation, review, and dissemination of research publications. Our pledge is to ensure the integrity and quality of the knowledge we contribute to the scholarly community.

The Commission is committed to fostering transparency and data integrity in all aspects of research. This includes transparent communication, disclosure of methodologies and data sources, and providing clear guidelines to authors, reviewers, and the broader academic community.

The Commission promotes ethical research conduct, emphasizing the responsible and respectful treatment of research participants.

The Commission places a strong emphasis on accessibility. We are committed to facilitating the translation of research findings into accessible formats in order to engage the broader public, taking into account ethical and legal considerations. Our goal is to promote public understanding and awareness of scientific advancements.

In adherence to these principles, the members of the Second Congressional Commission on Education (EDCOM II) pledge to be stewards of good scholarly research for a better, more inclusive educational system for the Filipino people.

Karol Mark R. Yee, PhD

EDCOM II Executive Director

Declaration of Funding

This research was conducted in collaboration with the Second Congressional Commission (EDCOM II).

The funding source played no role in the design of the study, data interpretation, or decision to publish the findings as the author(s) maintained complete autonomy in the research process, ensuring objectivity and impartiality in the presentation of results.

Declaration of Interest

None

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List of acronyms or abbreviations

AI	Artificial Intelligence
ANN	Artificial Neural Network
CHED	Commission on Higher Education
CMO	CHED Memorandum Order
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
GE	General Education
GenAI	Generative Artificial Intelligence
HEI	Higher Education Institution
LLM	Large Language Model
PSG	Policies, Standards, and Guidelines

Navigating the Generative Artificial Intelligence Era

Charting the Course for Curricular Reform in Higher Education in the Philippines

John Paul C. Vergara¹

Executive Summary

Recent advances in Generative Artificial Intelligence (GenAI), led by the widely adopted tool ChatGPT, are poised to disrupt various sectors, including education in the Philippines. This paper focuses on the impact of GenAI on Philippine higher education. It surveys studies of perceptions and responses from higher education stakeholders worldwide, analyzes the applicability of these perceptions and responses in the Philippine setting, and recommends a policy framework towards curricular reform that incorporates GenAI content in higher education curricula. The paper poses three research questions:

- (RQ1) How should higher education curricula be revised to effectively address the challenges and opportunities presented by Generative AI?
- (RQ2) What non-curricular initiatives should be implemented to empower educators, researchers, and administrators to effectively integrate these revisions?

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- (RQ3) What regulatory mechanisms and policies should agencies implement to facilitate these reforms?

We anchor this research on a review of literature on perceptions and responses of higher education stakeholders on GenAI developments. Recent studies on teacher and student perceptions on GenAI use yielded the following common themes:

- Academic integrity concerns
- Inevitable shift in assessment methods
- Concerns on unfavorable impact on learning outcomes
- Advocacy towards the beneficial and responsible use of AI tools
- AI literacy gap among students and educators
- Institutional support for the use of AI tools
- The need for clear policies on AI use

Higher education institutions (HEIs) have responded by issuing policies on AI use, primarily to address academic integrity concerns. Institutional responses include advice on course policies and assessment design, support for the use of AI tools to improve teaching and research, and curricular interventions to address the AI literacy gap. While some Philippine HEIs have responded to GenAI developments, there is a need to ensure HEIs across the country institute similar reforms. These reforms can be articulated through memorandum orders issued by the Commission on Higher Education (CHED), or CHED Memorandum Orders (CMOs), since it is generally recognized that HEIs are mobilized when these CMOs are issued.

Based on these findings, we answer the research questions with the following recommendations:

- Include AI content in the General Education curriculum available to all undergraduate students (RQ1)
- Incorporate discipline-specific AI content and methods in degree program offerings (RQ1)
- Enjoin HEIs to formulate and publish AI use policies (RQ2)

- Incentivize AI research relevant to the Philippine setting (RQ2)
- Facilitate curricular and AI-use policy recommendations through CMOs (RQ3)
- Create a National AI Strategy to ensure coordinated AI research (RQ3).

Keywords: Artificial Intelligence, Educational Technology, Generative AI, Higher Education, Curriculum Development

Introduction

Generative Artificial Intelligence (GenAI) tools have been widely used in recent years, led by ChatGPT (OpenAI ChatGPT, n.d.), a conversational chatbot that appears to simulate human intelligence by providing answers to questions on virtually any topic. There are tools similar to ChatGPT, such as Gemini (Google, n.d.) and Claude (Anthropic, n.d.), with other tools working on different modalities, generating content such as images (OpenAI Dall-E 3, n.d.) and videos (OpenAI Sora, n.d.) from simple text prompts. There is much discussion and discourse on how developments in GenAI would disrupt different sectors and industries, especially education, since the increased use of GenAI tools is bound to affect the way humans absorb and generate knowledge.

This paper focuses on the impact of GenAI on Philippine higher education. It surveys studies of perceptions and responses from higher education stakeholders worldwide, analyzes the applicability of these perceptions and responses in the Philippine setting, and recommends a policy framework to incorporate GenAI content in higher education curricula. The paper poses the following research questions:

1. How should higher education curricula be revised to effectively address the challenges and opportunities presented by Generative AI?
2. What non-curricular initiatives should be implemented to empower educators, researchers, and administrators to effectively integrate these revisions?
3. What regulatory mechanisms and policies should agencies implement to facilitate these reforms?

This study is commissioned by The Second Congressional Commission on Education (EDCOM II) and addresses two priority areas: Access to Quality Higher Education (Priority Area 11) and Digital Transformation and Educational Technologies (Priority Area 14). Specifically, it aligns with the following goals:

- “[Improve] the quality of higher education programs”
- “[Improve] access to educational technologies and sharing of resources” (EDCOM2, 2023, p. 1)

Generative AI and Large Language Models

Artificial Intelligence (AI) refers to the study of systems that exhibit intelligent behavior. AI tools have been widely used in the last two decades, often for internet search, route finding using GPS technology, and product or movie recommendations in shopping applications or streaming systems.

Generative artificial intelligence refers to a specific type of AI that generates content through systems that are trained on curated datasets. In the case of current conversational chatbots, the datasets are texts sourced from the internet, and systems can respond to text prompts or questions with reasonable accuracy. These systems are driven by Large Language Models (LLMs), artificial neural networks (ANNs) that can predict the next word from a sequence of previous words in a sentence or conversation. ANNs mimic the human brain by simulating the synaptic signals transmitted between neurons in the brain. In the case of LLMs, input signals are words provided sequentially, and the output signals are words that will likely follow this sequence. ANNs undergo learning or model training, where the numerical parameters that artificial neurons use to process and transmit signals are iteratively computed and updated using a method called *backpropagation* until a desired degree of accuracy is met. With enough neurons (estimated to be in the billions), training data, computing power, and sensible human conversations on virtually any topic can be generated by these models. The key to the success of such models is the type of artificial neural network used, which for LLMs is the transformer (Vaswani et al., 2017). Transformers use a self-attention mechanism that accurately captures context from sequential data to generate succeeding content.

Generative artificial intelligence refers to a specific type of AI that generates content through systems that are trained on curated datasets.

LLMs are just as effective in other modalities, such as images, audio, and video, since these can be encoded as signals within their respective domains. The latest versions of the current GenAI tools allow the user to interact with the chatbot through voice and images, providing a more convenient user experience.

The AI Index Report (Stanford University, 2024) surveyed the performance of contemporary AI tools, most employing LLMs, against human performance benchmarks in different areas. According to the report, AI has surpassed human performance in a variety of tasks, including natural language reasoning, medium-level reading comprehension, image classification, and visual reasoning, and nearing human-level performance in competition-level mathematics and visual common-sense reasoning.

However, LLMs are not without limitations. When provided a prompt, AI can generate a response to demonstrate its capabilities. Given the prompt: “Give me a 1000 word backgrounder on generative AI including a discussion on its limitations”, ChatGPT (OpenAI, 2024) generated the following response:

“Despite their impressive capabilities, generative AI models face several limitations and challenges:

- *Quality Control: Ensuring the quality of generated content is a significant challenge. While models can produce high-quality outputs, they can also generate nonsensical or inappropriate content, especially when not adequately trained or fine-tuned.*
- *Bias and Fairness: Generative models can perpetuate or even amplify biases present in their training data. This can lead to biased outputs, which is particularly concerning in sensitive applications like hiring or lending.*
- *Data Requirements: These models require vast amounts of data for training. Acquiring and curating such datasets can be costly and time-consuming. Moreover, some data may be proprietary or subject to privacy concerns.*
- *Computational Resources: Training state-of-the-art generative models demands significant computational resources, including high-performance GPUs and TPUs. This can limit access to such technology for smaller organizations or individuals.*
- *Interpretability: Generative models, particularly deep learning-based ones, are often seen as “black boxes.” Understanding and explaining how they generate specific outputs is challenging, which can hinder trust and adoption.*

- *Ethical and Legal Concerns: The ability of generative AI to create highly realistic fake content raises ethical and legal issues. Deepfakes, for instance, can be used for malicious purposes such as spreading misinformation or creating unauthorized digital replicas of individuals.*
- *Security: Generative models can be vulnerable to adversarial attacks, where slight modifications to the input data can lead to significant changes in the output. This poses security risks, especially in critical applications like healthcare or autonomous driving.”*

This, however, also demonstrates why there are concerns about intellectual integrity and appropriate attribution, especially in academic settings, as these tools can completely produce the work required in academic tasks.

GenAI impacts different professions and industries, stemming from the automation of knowledge-based tasks enabled by these GenAI tools. The workforce in virtually all sectors is expected to transform as a result of the efficiencies gained from this development. Industries will require AI-enabled skillsets, confront workforce reduction or realignment, and adapt to a rapidly evolving technology landscape that affects knowledge workers more than the manual labor workforce (Cerullo, 2024). The academe will have to adjust swiftly to leverage these technologies toward achieving learning outcomes and to ensure their graduates are prepared for a world where AI will be increasingly pervasive.

The rest of the paper is organized as follows: First, we review studies on student and teacher perceptions on the use of GenAI tools. This is followed by a survey of responses by academic institutions worldwide in terms of policies and support around GenAI use in the academe. We then take the perspective of higher education institutions in the Philippines and recommend a policy framework towards curricular reform incorporating GenAI.

Student and Educator Perceptions

Since the launch of ChatGPT in November 2022, interest in and adoption of GenAI tools have increased rapidly, especially in the academe, prompting several studies on the perceptions of both students and educators on the use of these tools.

A study in Hong Kong (Chan & Hu, 2023) surveyed undergraduate and graduate students from six universities on their attitudes towards GenAI. The study found that students had a positive attitude towards GenAI and that they were generally willing to use these tools to support learning, writing, research, creative activities, and repetitive tasks. On the other hand, the same students indicated challenges involving various aspects of the technology, such as reliability, accuracy, and transparency, as well as its impact on users' holistic

competencies, careers, and values. The students also noted concerns about the lack of and need for regulations and policies on GenAI use.

A Poland study (Walczak & Cellary, 2023) had a similar survey and noted widespread GenAI use to support writing, search, translation, and problem-solving. The students exhibited a willingness to integrate GenAI tool use in education but also expressed some concerns regarding assessment and trust in the tools.

A study in a university in Australia (Lee et al., 2024) surveyed its teaching staff on the use of GenAI and found that teachers were concerned with academic integrity. Educators also noted a need for university support to enable the use of the technology within the academic community.

A study in the United States (Barrett & Pack, 2023) focused on the writing process and surveyed both teachers and students on the appropriate use of AI tools. GenAI use was generally agreed upon as acceptable for idea generation and organization but not for actual writing completion. There was a minor disagreement regarding appropriate attribution and using GenAI for assessment, with teachers agreeing more than students in disclosing GenAI use and in using GenAI for feedback and evaluation. The survey also tackled GenAI use in general educational contexts and recommended clear university statements and policies on GenAI use.

A United Kingdom study (Johnston et al., 2024) surveyed students to inform changes to academic integrity rules at the University of Liverpool. The study reported widespread GenAI use, advocacy for the use of and equitable access to the tools, and a need for clear policies on their use.

One study involved students from multiple countries (Yusuf et al., 2024) and observed similar themes: widespread GenAI familiarity and use, concern for academic integrity, and a need for ethical guidelines.

A paper by Bobula (2024) carried out a comprehensive review of literature on GenAI use in higher education. From the studies reviewed (most of which were carried out in 2023), the following challenges were identified:

- Issues related to educational assessment
- Potential threats to academic integrity
- Privacy concerns
- The propagation of misinformation

- Equity, diversity, and inclusion aspects
- Copyright concerns
- Inherent biases within the models

The same paper identified the following opportunities and directions towards managing GenAI adoption:

- Update of assessment policies
- Development of guidelines for staff and students
- AI skills development
- Leveraging technology in the classroom

The paper concluded with a recommendation to allocate resources towards promoting GenAI adoption specifically to ensure staff readiness, and modifying educational programs to align with GenAI effects on the educational landscape.

One study assessed the impact of GenAI on the educational experiences of computer science and data science students in a university in Brazil using Exploratory Factorial Analysis (Pinto et al., 2024). The study observed that there was significant GenAI adoption “accompanied by a low incidence of technology anxiety, manifesting as fears of losing jobs to AI.” A significant correlation was also observed between academic burnout, dysfunctional learning strategies, and AI-related anxiety. The study highlighted the need to support effective GenAI adoption while addressing its psychological demands on students.

Another study that examined the possible harmful consequences of GenAI use among students (Abbas et al., 2024) revealed that the use of ChatGPT developed tendencies towards procrastination, memory loss, and poor academic performance. The same study showed that workload and time pressure increased the likelihood of ChatGPT use.

From the above studies, we summarize the challenges and opportunities derived from student and teacher perceptions as follows:

1. **Academic integrity concerns.** All studies identified academic integrity as a major concern, stemming from the ability of these tools to generate assigned work directly from the questions provided in an assignment. This is further complicated by the possible and arguably fair use of these tools in the process of accomplishing an assignment, such as gathering references and generating ideas and outlines.

There needs to be clarity on the acceptable use of these tools in the context of an assignment, as well as on proper attribution whenever these tools are used.

2. **Inevitable shift in assessment methods.** Teachers anticipate a change from traditional ways of assessing their students' performance, recognizing the ease with which these tools can be used for assigned work. Several methods have been suggested, from emphasizing in-class assessments to providing assignments to critique outputs of AI tools (Smolansky et al., 2023).
3. **Concerns on unfavorable impact on learning outcomes.** On the other hand, attention should be given to the consequences of user dependency on these tools and to ensuring critical thinking skills are still honed. There is evidence that students who use these tools more tend to procrastinate, suffer from memory loss, and underperform academically (Abbas et al., 2024).
4. **Advocacy towards the beneficial and responsible use of AI tools.** There is consensus on support for the use of these tools, provided they are used properly, either as study guides for students or as virtual assistants for teachers in their teaching tasks. Educators need to prepare their students for a world where the use of these tools will be increasingly pervasive, regardless of profession, which makes the familiarity with and practice of the responsible use of these tools within the academe even more relevant.
5. **AI literacy gap among students and educators.** Although these GenAI tools can be used with relative ease, both educators and students have a limited understanding of the underlying technology behind these tools, often viewing these tools as black boxes. They would benefit from a basic understanding of generative AI, including the capabilities and limitations of the technology, to enable beneficial and responsible use.
6. **Institutional support for the use of AI tools.** There are concerns on teaching staff readiness as well as an expressed need for universities to support the access to and use of GenAI tools within the academic community.
7. **Need for clear policies on AI use.** There is an expressed need for clarity in policies on the use of AI tools in the academic setting. Institutional policies and guidelines could spell out the responsible and appropriate use of AI tools and provide advice and guidance to educators on resources about GenAI.

Institutional Responses

Several universities worldwide have responded promptly, albeit hastily, to the widespread use of GenAI tools in the academe, primarily to address concerns on academic integrity, cheating, and plagiarism. Moorhouse et al. (2023) surveyed the world's 50 top-ranked universities and found that just under half of these universities have developed publicly available guidelines on the use of GenAI tools, covering academic integrity, advice on assessment design, and communicating with students. The study also focused on assessment design and found two suggestions for educators that appeared to prove effective: running assessment tasks through GenAI tools before assigning the tasks to students, and having students use GenAI tools as part of the assessment process. These suggestions would improve the effectiveness of assessment and develop AI literacy and critical thinking among students.

A similar study (McDonald et al., 2024) focused on research universities in the United States and examined those with publicly available policy documents on GenAI use. The study found that most of the universities encouraged the use of GenAI, with many providing advice on classroom use. In addition, more than half of the documents studied provided sample syllabi and curricula incorporating GenAI policies and content.

Chan (2023) proposed an AI policy education framework for teaching and learning using data on the perceptions of students and staff from Hong Kong universities. The framework has three dimensions: the pedagogical dimension tackles how to use AI for teaching and learning, the governance dimension tackles AI usage policies, and the operational dimension tackles issues related to infrastructure and training. The study provided ten key themes “relevant to planning for a university AI policy:

1. Understanding, identifying, and preventing academic misconduct and ethical dilemmas
2. Addressing governance of AI: Data privacy, transparency, accountability, and security
3. Monitoring and evaluating AI implementation
4. Ensuring equity in access to AI technologies
5. Attributing AI technologies
6. Providing training and support for teachers, staff, and students in AI literacy
7. Rethinking assessments and examinations
8. Encouraging a balanced approach to AI adoption

9. Preparing students for the AI-driven workplace
10. Developing student holistic competencies and generic skills”

Some universities have integrated AI use and education within higher education curricula. For instance, in the Indian Institute of Technology-Bombay, an Artificial Intelligence and Data Science course was mandated for all its undergraduate students (Smart, 2023) to prepare them for the job market. At the University of Florida, an “AI across the curriculum” initiative has been developed (Southworth et al., 2023) and adopted (University of Florida, 2024), enabling AI courses to be offered within each of its 16 colleges, providing an option for all undergraduate students to obtain a certificate by taking additional courses in AI. The initiative’s main goal is to create an AI-ready workforce through a curriculum framework that tackles five AI literacy areas: enabling AI, knowing and understanding AI, using and applying AI, evaluating and creating AI, and practicing AI ethics.

Several studies also explored the implications of GenAI developments on specific disciplines such as engineering (Qadir, 2023), medicine (Preiksaitis & Rose, 2023), computer science (Hazzan & Erez, 2024), language (Kohnke et al., 2023), and arts and humanities (Rane & Choudhary, 2024). These studies indicate the same themes aforementioned: concern for academic integrity and leveraging technology for achieving learning outcomes, with discipline-specific considerations.

The Philippine Higher Education Context

HEI Responses to GenAI

Some higher education institutions (HEIs) in the Philippines have responded to GenAI developments and issued policies or embarked on initiatives to address the issue of responsible AI use. The University of the Philippines was the first in the country and among the first in Asia (ABS-CBN News, 2023) to publish a statement on AI Use entitled “Principles for Responsible and Trustworthy Artificial Intelligence” (University of the Philippines, 2023). Table 1 lists HEIs that have issued publicly available policies or embarked on policy initiatives related to responsible AI use. This list was obtained by gathering successful search results after performing an internet search with the phrase “<HEI name> generative AI policies” on the top 16 Philippine universities listed in the QS University Rankings 2024 for South-Eastern Asia (QS World University Rankings, 2024).

TABLE 1. HEI POLICY STATEMENTS AND INITIATIVES ON AI USE

Higher Education Institution	Policy Statement or Initiative
Ateneo de Manila University	GenAI Task Force (Ateneo de Manila University, 2023)
Far Eastern University	Student Guidelines on the Use of Generative Artificial Intelligence (Far Eastern University, 2024)
Mapua University	Academic Policy on Generative AI at Mapua University (Mapua University, 2023)
Mindanao State University	Mindanao State University Policy on the Ethical Use of Artificial Intelligence and its Applications (Mindanao State University, 2024)
Silliman University	SU Designs Framework for GenAI Integration in Academia (Silliman University, 2024)
University of the Philippines	Principles for Responsible and Trustworthy Artificial Intelligence (University of the Philippines, 2023)
University of the Philippines – Open University	Guidelines on the Use of AI in Teaching and Learning (University of the Philippines - Open University, 2024)
Xavier University – Ateneo de Cagayan	Establishment of the Committee on Responsible AI Use at Xavier Ateneo (Xavier University-Ateneo de Cagayan, 2024)

Common to all the statements and initiatives listed in Table 1 is the clarification of what is considered acceptable AI use in academic settings to inform academic integrity policies. Other elements indicated in one or more of the pronouncements include:

- Leveraging GenAI to improve teaching and learning
- Leveraging GenAI to improve research and creative work
- Promotion of ethical AI use
- Faculty training on GenAI
- University support for access to AI tools

This provides some indication that at least the top universities in the country are responding to GenAI developments, considering that these policy elements are comparable to those adopted by universities in other countries, as indicated in the previous section. However, ensuring that the rest of HEIs in the country follow suit is a more challenging task.

The Role of CHED Technical Panels and Committees

The majority of the HEIs in the Philippines are compliance-focused and would await issuances, or CHED Memorandum Orders (CMOs), from the Commission on Higher Education (CHED) before carrying out interventions in the design and delivery of their institutions' program offerings. These issuances take the form of Policies, Standards, and Guidelines (PSGs) for particular degree programs. The PSGs are drafted by Technical Panels and Technical Committees assigned to the different disciplines.

The majority of the HEIs in the Philippines are compliance-focused and would await issuances from the Commission on Higher Education (CHED) before carrying out interventions in the design and delivery of their institutions' program offerings.

Two interviews (Laurito, Roxas, & Teehankee, personal communication, November 29, 2023; Carag, Sabanpan-Yu, Santos, & Vilches, personal communication, February 21, 2024) were conducted with representatives from selected Technical Panels to gather their perspectives on how HEIs and CHED should respond to GenAI developments. The following disciplines were represented in the interviews: Business, Information Technology, Engineering, and Humanities. The interviewees were asked the following questions:

1. Do you think curricular revisions for degree programs under your assigned discipline are in order because of the developments in AI, and generative AI in particular?
2. Do you think a policy paper or reference document would be useful to guide or enable such revisions?
3. Are there other policy interventions related to AI (e.g., on the use of AI tools) that you think are important specifically for your discipline?

There was a consensus on the first question regarding the need for curricular revisions, with interviewees providing examples within their disciplines, such as the improvement of the Business Ethics course to include GenAI as an emerging product type, or the review of software development courses in Computer Science considering GenAI tools can generate complete program code. Representatives from the Humanities note the need to reemphasize in-class writing tasks for more effective assessments, since essay assignments are prone to submissions aided by GenAI tools. Interviewees agreed that different disciplines will have specific approaches on how to update their respective curricula as they respond to GenAI developments.

AI literacy was also recommended as a learning outcome applicable to all undergraduate students, and the inclusion of a course in AI tailored for non-experts in the general education curriculum was suggested. The course would include topics that provide a fundamental understanding of AI, its ethical dimensions, and its impact on society.

The importance of CHED issuances and directives was also highlighted, with the CMOs on PSGs as the main issuance that would mobilize HEIs. A CHED CMO is also in order to direct the Technical Panels to embark on revisions on their respective PSGs to address GenAI developments. Finally, the creation of AI policies within HEIs was considered essential to address concerns about acceptable GenAI use and academic integrity.

A National AI Strategy

A whole-of-government approach is ideal for the establishment of a National AI Strategy or Roadmap for the country covering different aspects of AI. The academe would benefit from such an initiative as it could assume coordinated AI-related efforts with relevant agencies on top of science and technology research and industry development, for instance. We list some attempts at this objective.

1. The Department of Science and Technology (DOST) launched the National AI Roadmap in 2021, detailing AI strategies around facilities and services, human resources, technologies, and policies (Department of Science and Technology, 2021).
2. The Department of Trade and Industry (DTI) launched a National AI Strategy Roadmap, which aimed to “*position the Philippines as an AI center of excellence and a big data processing and analytics hub providing high-value data analytics and AI services to the world*” (Department of Trade and Industry, 2021). The roadmap was updated in 2024 to incorporate GenAI and to launch a Center for AI Research (Department of Trade and Industry, 2024).
3. House Bill No. 7983: An Act Providing A National Strategy for the Development of Artificial Intelligence, Creating for the Purpose the National Center for Artificial Intelligence Research, and Appropriating Funds Therefor (Senate of the Philippines, 2023) was filed in 2023 and is still pending with the House Committee on Science and Technology.

A whole-of-government approach is ideal for the establishment of a National AI Strategy or Roadmap for the country covering different aspects of AI.

The DOST and DTI national roadmaps appear unrelated and uncoordinated but have overlaps concerning AI research projects and funding. House Bill 7983 spells out a section that establishes a National Center for AI Research, with a board comprising members from different agencies, including DOST, CHED, and DTI. This promises to enable a more coordinated approach, which the country would need, although the bill is yet to be passed.

Policy Discussion and Recommendations

The eventual goal is to have HEIs in the country formulate their AI use policies, leverage GenAI tools for improved teaching and learning, and revise their program offerings to incorporate AI content as applicable. We propose that CMOs be issued with the following recommendations.

Recommendation 1: Policy Templates on AI Use

To ensure the beneficial and ethical use of AI within the academic community, consistent with desired learning outcomes across all higher education curricula, we recommend that policy templates around AI use be formulated and that these templates be made available to all HEIs as references. This aims to facilitate internal conversations and consultations within the respective HEIs and enable them to have official statements and policies pertaining to:

- The fair and responsible use of AI tools, stating specifically how it impacts academic integrity and honor code policies;
- Recommendations on written stipulations related to AI use to be placed on course syllabi, providing details on acceptable and prohibited practices; and,
- The position of the HEI on use, access, and support for the different AI tools.

We recommend that policy templates around AI use be formulated and that these templates be made available to all HEIs as references.

Recommendation 2: AI in General Education

To address the AI literacy gap and ensure all learners are equipped with a basic understanding of AI tools and the methods and technologies behind these tools, we recommend that AI topics be incorporated in the General Education (GE) curriculum. CMO 20, s2013 spells out the prevailing standard for GE courses “to expose undergraduate students

to various domains of knowledge and ways of comprehending social and natural realities, developing in the process, intellectual competencies and civic capacities” (Commission on Higher Education, 2013, p. 1-2). We recommend that AI be considered as an important domain and that the following topics be tackled:

- A fundamental understanding of Artificial Intelligence: key definitions in the field, how it has evolved, the various methods employed by AI systems and by generative AI tools in particular;
- A description of and orientation on contemporary AI tools to facilitate exposure to and practical use of these tools, as well as an understanding of their strengths and limitations;
- Ethical dimensions of AI, with an emphasis on the importance of ensuring that these tools are accurate, safe, reliable, and beneficial; and,
- Impact of AI on different sectors and industries, and society at large.

We recommend that AI topics be incorporated in the General Education (GE) curriculum.

The aim is a learning outcome for graduates to become critical thinkers and ethical, responsible, and productive users of AI in the workplace.

Two options may be taken by HEIs for consideration of the appropriate Technical Working Group that will draft these amendments to CMO 20 s2013:

1. The inclusion of an Artificial Intelligence and Society course as part of the GE curriculum covering the topics indicated, either as a required course or as an interdisciplinary GE elective, or
2. Incorporating the indicated topics in existing GE courses, specifically, the courses on Science, Technology, and Society, and Ethics.

Recommendation 3: AI within Disciplines

It is further recommended that the different Technical Committees review their respective degree programs and determine which components of their curricula require the inclusion of relevant AI topics. This may involve the addition of courses or revision of existing courses to cover topics in AI. Inclusion of topics and areas of emphasis would

depend on the discipline, but it is recommended that the following areas be placed under consideration:

- **Generative AI content:** Many disciplines could benefit from a more advanced understanding of Generative AI, specifically those that inherently tackle aspects that are integral to Large Language Models. Among these fields are Computer Science, Languages, and Psychology.
- **Tools and Technologies modules.** The addition or revision of courses tackling tools or technologies in different contexts within the discipline should be considered to employ GenAI tools as applicable in domains relevant to the discipline. For example, the ability of these tools to generate simulations rapidly can be leveraged and employed in fields such as engineering (Qadir, 2023) and medicine (Preiksaitis & Rose, 2023).
- **Multidisciplinary perspectives:** Since AI is poised to disrupt and pervade different areas of society, different disciplines may study its impact from their respective standpoints. For example, fields like Economics and Development Studies may tackle the impact of AI on human labor; Business may tackle quality standards for GenAI products, and Psychology and Philosophy may reflect on the consequences of GenAI on notions of intelligence.

It is further recommended that the different Technical Committees review their respective degree programs and determine which components of their curricula require the inclusion of relevant AI topics.

Technical Committees are also encouraged to evaluate whether some portions of their respective programs may be delivered using alternative modalities, perhaps through independent or guided study with the aid of GenAI tools.

It is recommended that a CHED Technical Working Group (TWG) in AI be convened with members from different disciplines to evaluate and consider Recommendations 1 through 3 and draft the corresponding CMOs (or a single CMO covering all recommendations). Recommendation 1 enjoins HEIs to draft and release AI use policies to their respective academic communities. Recommendation 2 directs HEIs to incorporate relevant AI content in specific courses available to all undergraduate students. Finally, Recommendation 3 directs the Technical Committees tasked to draft revised PSGs in their respective disciplines for eventual adoption by the HEIs.

Effective AI integration in higher education should include research support, as this complements the innovations and reforms in teaching. The possibilities for research in AI are vast, especially in locally relevant areas. The following recommendation takes advantage of this opportunity.

Recommendation 4: AI Research

It is recommended that multidisciplinary research initiatives on GenAI be incentivized. We provide two examples of research projects that would address the current limitations of GenAI and improve its impact in the Philippine context, requiring tight coordination between agencies:

- **AI systems fine-tuned to the Philippine/Asian context.** Current GenAI tools have an inherent bias, and there is a growing movement towards building AI systems that are more appropriate to regional contexts and are sensitive to local language, history, and culture. Developing such systems requires a coordinated effort to establish and generate standard datasets in different areas involving language, history, and culture, among others. Aspects of quality control and equitable access to these systems should also be addressed.
- **An accessible data portal for the country.** AI systems require training data, often produced by other research projects. A project that sets up a working data commons infrastructure available to HEIs and other stakeholders would stimulate further AI research relevant to the country.

It is recommended that multidisciplinary research initiatives on GenAI be incentivized.

AI research should be well-coordinated and is best carried out when directed by a genuine National AI Research Strategy, considering that AI projects such as the two examples listed above are not just multidisciplinary but would involve multiple agencies. We recommend that House Bill 7983 (Senate of the Philippines, 2023) be fast-tracked and that a body directing all AI research that contributes to national development be established. There should be adequate representation across different sectors (academe, government, and industry) and agencies. This will help ensure coordination between the sectors and agencies and meet intended outcomes.

Conclusion

In this paper, we identified the challenges and opportunities brought about by GenAI developments gathered from the perspectives of teachers and students in higher education settings worldwide. We then surveyed how different universities responded to these challenges and opportunities through AI policy interventions and curricular reforms. The most important issues identified in the Philippines are responsible AI use, leveraging AI technologies to improve teaching, learning, and research, and curriculum reform incorporating relevant AI content.

We provided four recommendations:

1. Enjoin HEIs to formulate and publish AI use policies;
2. Include AI content in the General Education curriculum available to all undergraduate students;
3. Incorporate discipline-specific AI content and methods in degree program offerings; and,
4. Incentivize AI research relevant to the Philippine setting.

These four recommendations answer the first two research questions posed in this paper. Recommendations 2 and 3 put forward directions on how higher education curricula should be revised to effectively address the challenges and opportunities presented by Generative AI (RQ1). Recommendations 1 and 4 suggest non-curricular initiatives that should be implemented to empower educators, researchers, and administrators to effectively integrate these revisions (RQ2). Regarding the regulatory mechanisms and policies that agencies should implement that will facilitate these reforms (RQ3), we noted that the first three recommendations can be facilitated through CHED CMOs and that the last recommendation can benefit from a more concerted National AI research strategy.

Areas for Further Research

- **Coordination of National AI Strategy Between DTI and DOST:** Investigate the potential synergies and coordination between the Department of Trade and Industry (DTI) and the Department of Science and Technology (DOST) in advancing the National AI Strategy. This includes how these agencies can collaborate on educational, industrial, and research initiatives, as well as how they can impact higher education curriculum reforms.

- **Public Perception and Preference for Bachelor's Degrees in the AI Era:** Research the public's preference for bachelor's degree programs and how this impacts the adoption of AI-related skills and competencies within the Philippine Qualifications Framework (PQF) and Philippine Skills Framework (PSF) programs. This research could explore ways to promote alternative educational pathways or certifications that integrate AI skills and literacy at different PQF levels. The goal would be to identify how AI-related micro-credentials, short courses, and professional certifications can address the growing demand for AI competencies, making AI education more accessible to a broader segment of the population beyond traditional degree programs.
- **Industry and MSME Collaboration on AI Curriculum:** Explore how TESDA (Technical Education and Skills Development Authority) can develop AI-related courses that meet the specific needs of industries and MSMEs (Micro, Small, and Medium Enterprises). This would include identifying potential entities or platforms where TESDA could collaborate with industries to ensure that curriculum development aligns with market needs, particularly for MSMEs.

Biographical note

John Paul Vergara is a professor of Computer Science at the Ateneo de Manila University, where he held the post of vice president from 2010-2016 and 2019-2022, overseeing the university's higher education units. He is a member of the CHED Technical Panel for Information Technology Education and the CHED Technical Working Group for Graduate Education. He obtained his BS degree in Mathematics/Computer Science from Ateneo de Manila and his MS and PhD degrees in Computer Science from Virginia Tech. He specializes in algorithms, computability, and artificial intelligence.

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This policy paper is funded from the UP President Edgardo J. Angara Fellowship Award for 2024, and is released under the Monograph Series published by the University of the Philippines Center for Integrative and Development Studies.



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