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Utilization of Generative Artificial Intelligence in Public Safety Educational Institutions Towards 21st Century Skills Development

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***Abstract*: This study explored the utilization of Generative Artificial Intelligence (GenAI) in public safety educational institutions in the Philippines towards the development of 21st-century skills among public safety student officers. The research utilized a mixed-method explanatory-sequential participant selection design based on the P21 Framework for 21st Century Skills and the Technology Acceptance Model (TAM). Quantitative data were collected via surveys from the Officers Advance Course students, a training course mandated by Republic Act 6975 and 9263, specifically conducted at the National Jail Management and Penology Training Institute (NJMPTI) and the National Police College (NPC). This was followed by qualitative interviews with top scorers from the quantitative phase to gain deeper insights. The findings revealed that GenAI significantly enhanced key learning skills such as communication, creativity, and critical thinking; literacy skills like technology literacy; and life skills, including leadership and productivity. However, the study also identified several challenges in GenAI utilization, including ethical concerns, limited infrastructure, and a lack of institutional guidelines. Respondents highlighted the need for ethical frameworks, institutional support, and training programs to maximize AI's educational benefits. A capacity-building program is proposed to institutionalize GenAI in the Philippine Public Safety College training institutions, aiming to equip public safety officers with future-ready competencies. The study concluded that, when responsibly and systematically integrated, GenAI can transform public safety education by cultivating the critical skills needed for effective leadership and service in a digital era.**

***Keywords*: Generative Artificial Intelligence (GenAI), 21st-Century Skills, Police Training, Prison Officer Training, Philippine Public Safety College.**

1. Introduction

In today's modern and digital age, technology has become an integral part of people's daily lives, including the way people communicate, work, learn, and live, whether they are aware of it or not. This 21st-century world is evolving at a profound pace, and with the advent of technology, everything is getting updated. Thus, the world is undergoing tremendous rapid technological transformations or changes that are restructuring various sectors, including education. Among these technological advancements, integrating artificial intelligence (AI) and digitalization in education is revolutionary and has the potential to change learning environments, including the Philippines.

In 2019, the United Nations Educational, Scientific and Cultural Organization (UNESCO) published the Beijing Consensus on Artificial Intelligence and Education, anchored on their Global Education 2030 Agenda. The consensus presents the opportunities that AI could bring to improve educational institutions. They stated that in order to support the achievement of the Sustainable Development Goals (SDGs) of the United Nations by 2030, particularly SDG Number 4 on Quality Education, the systematic integration of AI is significant to innovative education, teaching, and learning. Furthermore, leveraging AI to accelerate the delivery of open and flexible education systems will enable education to be more inclusive, equitable, and accessible and could promote lifelong learning opportunities for all.

In addition, UNESCO (2019) presented how AI can be used (1) to improve learning outcomes, (2) to prepare learners to thrive in an AI-saturated future, (3) the challenges and policy implications in education, and (4) an open invitation or call for everyone—researchers, educators, policymakers, students, and other stakeholders — to participate in discussions about how AI can be utilized for education aimed at sustainable development.

As the nation strives to meet the demands of the 21st century, educational institutions are now realizing more and more how significant and inevitable technology and AI are to cope with these demands. Along this line, for individuals to be successful in the modern workplace, they need to possess the abilities that are required for the 21st century, such as: Learning Skills (Critical Thinking, Creativity, Collaboration, Communication); Literacy Skills (Information Literacy, Media Literacy, Technology Literacy); and Life Skills (Flexibility, Leadership, Initiative, Productivity, Social Skills) (Aver et al., 2021). These skills are becoming increasingly vital as technology, particularly artificial intelligence, continues to improve (Akpan et al., 2024).

It is evident that AI will significantly impact education and training facilities that provide lifelong learners with the skills

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they need to function in the workplace and society, as well as humanity as a whole. Education and training institutions, especially those that focus on intermediate skills, must accept their role in the transformation process (UNESCO, 2019; UNESCO, 2021).

Furthermore, a study by Giray et al. (2024) showed that Filipino educators and administrators generally recognize AI as a powerful tool that can improve teaching, simplify administrative tasks, and enhance research output. They point to specific examples of how AI can support learning while also acknowledging its limitations, especially in providing context to experiences.

Although they view AI tools positively in their professional settings, they express concerns regarding issues such as cheating, data manipulation, and a potential decline in creativity and critical thinking skills. Consequently, they stress the importance of having regulatory policies and ethical guidelines for AI use in higher education. Additionally, they note whether their institutions have established AI-related policies. This column advocates for Philippine educational institutions to reconsider their approach to the growing influence of AI (Giray, et al., 2024; Russell & Norvig, 2020; Trisnawati et al., 2023).

Additionally, a review by Dalan (2023), was done to explore artificial intelligence integration in language education in the Philippine context, which was aimed to critically analyze existing literature and initiatives related to AI integration in language education, focusing on its implications, challenges, and opportunities within the Philippine educational context. To achieve this, a systematic review method was employed, analyzing and synthesizing relevant literature from various databases.

The findings revealed the current state of AI integration in language education, emphasizing its advantages in enhancing learning processes, addressing linguistic diversity, and fostering inclusivity. However, the review also identifies significant challenges, including infrastructural issues, cultural factors, and ethical concerns (Dalan, 2023; Giray, et al., 2024; Russell & Norvig, 2020; Trisnawati et al., 2023). There is a notable rise in interest and investment in AI-driven language education tools and platforms in the Philippines, yet there is a pressing need for more localized and culturally aware approaches to fully harness AI's potential in meeting the diverse linguistic needs of Filipino learners. In summary, while AI presents exciting possibilities for transforming language education in the Philippines, it is crucial to consider contextual factors and ethical implications for its successful and equitable application. This review offers valuable insights into the impact of AI in language education, serving as a resource for educators, policymakers, and researchers.

Currently, the Philippine Public Safety College, which is also the locale of this study, has yet to integrate AI into its courses. Last August 2024, it just started its first cyber course, which focused more on preventing cyber threats. Elaboration on the good use of AI was pioneered in that course. However, in the other constituent units, it was yet to be included in their curricula. Lastly, the result of this research study served as the basis for integrating AI as a capacity-building activity, which can educate public safety officers on how to utilize AI technologies towards the development of their 21st-century skills.

2. Methodology

A. Research Design

The study adopted a mixed sequential explanatory-participant selection design. Initially, participants were selected using a constructed survey, followed by one-on-one interviews with top-scoring individuals in the initial quantitative phase. This design allowed for a deeper understanding of the participants' perceptions by using survey results to inform interview selection, ensuring the study targeted individuals with relevant experience in generative AI, crucial for developing a capacity-building program in public safety education.

B. Research Locale and Participants

The research was conducted within two constituent units of the Philippine Public Safety College: The National Jail Management and Penology Training Institute (NJMPTI), the premier training institution for prison officers of the country and the National Police College (NPC), the training arm of police, firemen, and prison officer executive ranks, all in Calabarzon. Participants were public safety student officers enrolled in the Officers Advance Course, an 80% academic 20% tactical training for captain ranks (for CY 2024 and 2025). The study's participant pool was purposely limited to officers engaged in hybrid learning, aligning with the study's focus on AI integration in modern educational settings. As said previously in the research design of this study, the participants from the second phase of the study were picked from the first phase based on their scores. The top five students from the police advance course and prison advance course were the ones included in the qualitative interviews (there were 6 from the prison advance course due to tied scores, a total of 11 quali participants).

C. Research Instrument

Two primary instruments were employed in this study: a constructed survey called the UAPS21 (Utilizing AI in Public Safety Educational Institution Towards 21st Century Skills Development Survey Questionnaire) to assess perceptions of AI's impact on training and skills development, and a semi-structured interview to explore individual insights more deeply. The survey was piloted and validated by experts, also obtaining a Cronbach's Alpha of 0.985850828 for its internal consistency. It used a four-point Likert scale to avoid neutrality. Consequently, the researcher crafted five (5) main key-point questions that elaborates the experience, opinion, and perspective of the participants with regard to the impact of GenAI to 21st century skills of police and prison officer trainees/students.

D. Data Gathering and Analytical Procedures

Data collection followed a sequential process beginning with the administration of the UAPS21 survey, followed by thematic analysis of the interviews. Quantitative data was analyzed using

simple mean scores, while qualitative responses were transcribed, coded, and categorized into themes. The themes served to reinforce and explain the quantitative findings. Interviews were conducted both by face-to-face or asynchronously, depending on the participants' availability, with careful clustering of insights into coherent subthemes and major themes.

E. Ethical Considerations

The study strictly adhered to the Data Privacy Act of 2012 of the Philippines, ensuring participants' informed consent and confidentiality. Participants were briefed on the purpose of the research, their rights, potential risks and benefits, and data handling protocols. Ethical transparency was a core principle throughout the research process, reinforcing the legitimacy and respectfulness of the study's engagement with its human subjects.

3. Results and Discussion

A. Extent on the Utilization of Generative AI Tools Towards the Development of 21st-Century Skills of the Respondents in Terms of Learning Skills

The extent on the utilization of Generative AI tools towards the development of 21st-Century Skills of the respondents in terms of Learning Skills as reflected in Table 1 had a general assessment of 2.8735 which was interpreted as High extent. The indicator "Utilization of Generative Artificial Intelligence (AI) tools enhance my ability to draft reports, presentations, and other correspondence with clarity and precision" had the highest mean of 3.0792 while the indicator "Utilization of Generative Artificial Intelligence (AI) tools strengthen my ability to solve problems systematically." had the lowest computed mean of 2.6832, but both were interpreted as high extent.

The results implied that respondents perceived AI tools as significant contributors to the development of core learning competencies. They viewed generative AI tools as valuable resources in enhancing the learning process, enabling the respondents to think critically, generate creative ideas, and communicate effectively. This implied that the respondents generally see AI tools as beneficial in their professional tasks.

1) Generative AI Enhances Communication Skills

The use of generative AI in drafting reports and presentations, creating communications and correspondences, improving vocabulary and writing, and strengthening grammar by identifying and correcting errors was some of the evidence that generative AI indeed enhances the communication skills of the respondents. As seen in Table 1 (statement numbers 1 to 3) in the previous page, the statements concerning the enhancement of communication skills through generative AI obtained a mean range from 2.9802 to 3.0792, interpreted as a high extent of enhancement.

Elkot et al. (2025) mentioned that a conversational type of generative AI was used as an independent variable in improving communication skills. The participants in this study were students with mild intellectual disabilities, who were evenly split into two groups. One group of six students took part in AI-guided conversations, while the other group engaged in open-ended conversations with AI. The findings showed that guided conversations with generative AI notably improved participants' English communication skills. This highlighted the value of structured support in enhancing understanding and participation in various English communication tasks for students with mild intellectual disabilities. Furthermore, the study advocated for incorporating AI tools in education (Akpan et al., 2024; Celik et al., 2024; Elkot et al., 2025; Judijanto et al., 2024; UNESCO, 2019; UNESCO, 2019b; UNESCO, 2019c; UNESCO 2021) to assist students with disabilities, stressing the importance of customizing AI applications to meet varied learning needs (Elkot et al., 2025).

Another study also linked generative AI to communication skills development, the study of Wijayati et al. (2024) on enhancing business communication skills in vocational education using generative AI. They have found that incorporating Generative AI into business communication training for vocational students offers a powerful way to improve learning outcomes and equip students for the challenges of today's workforce. Through AI-powered tools, learners can engage in practical communication exercises within interactive, tailored settings, gaining immediate feedback that enables faster and more effective skill development compared to conventional approaches (Akpan et al., 2024; Celik et al., 2024; Elkot et al., 2025; Judijanto et al., 2024; Wijayati et al., 2024).

The previous data and literature dictate the role of generative AI in enhancing one's communication skills. Relatively,

Table 1
Extent on the enhancement of learning skills through utilization of generative AI (N=101)

Indicator	Mean	Interpretation
Utilization of Generative Artificial Intelligence (AI) tools…		
1. Enhance my ability to draft reports, presentations, and other correspondence with clarity and precision.	3.0792	High extent
2. Improve my vocabulary and writing skills, particularly in crafting well-structured presentations for briefings and debriefings to diverse stakeholders	3.0000	High extent
3. Strengthen my ability to identify and correct communication errors by providing paraphrasing suggestions and detecting plagiarism.	2.9802	High extent
4. Assist me in designing multimedia content, such as graphics/images, videos, animations, and other materials for presentations or performance tasks.	2.9406	High extent
5. Help me create high-quality videos and multimedia content with minimal effort and time investment.	2.8218	High extent
6. Allow me to efficiently organize ideas and structured presentations, ensuring clarity and creativity.	2.9505	High extent
7. Enhance my ability to analyze information, evaluate solutions, and make informed decisions.	2.7030	High extent
8. Strengthen my ability to solve problems systematically.	2.6832	High extent
9. Encourage me to think critically about ethical considerations and potential biases in public safety decision-making.	2.7030	High extent
GENERAL ASSESSMENT	2.8735	High extent

Legend: 3.25 – 4.00 Very High Extent (VHE), 2.50 – 3.24 High Extent (HE), 1.75 – 2.49 Moderate Extent (ME), 1.00 – 1.74 Least Extent (LE)

follow-up interviews were conducted to the top five (5) participants in terms of score in the quantitative phase for each Bureau: Five (5) participants were interviewed for police bureau and six (6) for Bureau of Jail Management and Penology (BJMP)—there was a tied score in the fifth place for BJMP. With this follow-up interview, the responses from the 4-point survey in the quanti phase were probed, explored, and analyzed. The analysis done was called thematic analysis. It was noted that seven out of eleven interviewees viewed generative AI as a communication skill-enhancing tool. It was pointed out that applications such as ChatGPT, Meta, Copilot, and Grammarly all helped in shaping and improving one's communication skills. As previously expounded by Elkot (2025), generative AI can act as a converser, or a conversation tool which can be utilized to practice English in grammar and punctuation, or for comfort in communicating in general.

2) Generative AI Enhances Creativity Skills

The use of generative AI in designing multimedia content, such as graphics/images, videos, animations, and other materials for presentations, creating high-quality videos and multimedia content with minimal effort and time investment, and in efficiently organizing ideas and structuring presentations were some of the evidences that generative AI indeed enhances creativity skills of the respondents. As seen in Table 1 (statement numbers 4 to 6), the statements concerning the enhancement of creativity skills through generative AI obtained a mean range from 2.8218 to 2.9515, interpreted as a high extent of enhancement, the same as the enhancement of communication skills.

A study by Habib et al. (2025) assessed college students through an Alternative Uses Task (AUT) Test in a creativity course and how generative AI impacted it. The study, also a mixed method, focused on measuring flexibility, fluency, elaboration, and originality to determine how ChatGPT-3 influenced students' divergent thinking. Findings suggested that while AI could effectively enhance creative thinking, its use in education must be cautiously approached due to possible adverse effects on creativity and students' confidence in their creative abilities. It was also noted that they found out that the AI primarily impacts creativity in its first step—brainstorming and idea generation.

Another study was the paper of Doshi and Hauser (2024), which examined the causal effects of generative AI-generated ideas on short story writing through an online experiment in which some participants received prompts from a large language model (LLM). The results showed that access to these AI-generated ideas led to stories being rated as more creative, better written, and more enjoyable, particularly among writers who were initially less creative. Their findings suggest that stories generated with the help of generative AI tended to be more similar than those created solely by humans. Furthermore, these findings indicated that while individual creativity improved (Akpan et al., 2024; Celik et al., 2024; Judijanto et al., 2024; Wijayati et al., 2024), there was a trade-off in terms of reduced overall originality. This pattern mirrored a social dilemma: although writers benefited individually from using generative AI, the collective output became less diverse.

It was also noted that seven out of eleven interviewees in the qualitative phase viewed generative AI as a creativity catalyst and enhancer tool. It was noted that applications such as Canva, ChatGPT, and Adobe helped carve out one's creativity skills. As previously asserted by Habib et al. (2025), generative AI and generated media can all act as a stimulator—a catalyst for brainstorming and idea generation, a crucial part in creators' and artists' lives because mental blocks and mental stalemates were some of their nemeses. Doshi and Hauser (2024) further proved that creativity was truly enhanced by generative AI technologies these days. However, originality now becomes futile.

3) Generative AI Enhances Critical Thinking Skills

The use of generative AI in enhancing one's ability to analyze information, evaluate solutions, and make informed decisions, in strengthening one's ability to solve problems systematically, and in encouraging one to think critically about ethical considerations and potential biases in public safety decision-making were some of the evidences that generative AI indeed enhances creativity skills of the respondents. As seen in Table 1 (statement numbers 7 to 9), the statements concerning the enhancement of critical thinking skills through generative AI obtained a mean range from 2.6832 to 2.7030, interpreted as a high extent of enhancement.

Several studies expounded the helpful effects/ impacts of generative AI on the critical thinking skills of students/ learners/ trainees. One study examined the effects of generative artificial intelligence tools on university students' critical thinking and collaboration. Emphasizing the need to explore these technologies due to their growing presence in higher education and their potential to reshape conventional teaching methods, Ruiz-Rojas et al. (2024) surveyed a predominantly female group to evaluate their awareness, experience, and perceptions of generative AI tools. Results showed 87% of participants were familiar with these tools, and 38% reported using them occasionally. The most frequently used tools included Canva 2024 (33%), Chat PDF (26%), and YOU.COM (24%). Furthermore, 64% of the respondents believed that these tools had a significant positive impact on their critical thinking skills.

Another study was about using one generative AI and its effect on cultivating critical thinking in higher education. Having similar population (higher education), this study by Shanto et al. (2024) where in it aimed to design and assess a conceptual framework called "AI-CRITIQUE" (AI-based Critical Reflection and Insightful Thought Unleashed for Education), which was intended to enhance critical thinking skills in higher education through the use of ChatGPT. The framework offered structured guidance for generating focused questions, gathering multiple viewpoints, evaluating responses, synthesizing insights, and engaging in reflective learning to critically assess and expand upon AI-generated content. An empirical investigation was carried out with 20 undergraduate students, who answered an open-ended question with and without ChatGPT's aid, applying the proposed framework during AI-assisted tasks. Their responses were evaluated using Lee's model of thinking levels. A survey was also conducted to gather students' perceptions. Findings revealed that students'

average thinking level rose significantly, from recall (1.35) to rationalization (2.4), when using the framework alongside ChatGPT. On average, students reported that AI notably supported their idea generation (4.0/5.0) and critical analysis (4.2/5.0) compared to working independently. The study offered preliminary evidence that the AI-CRITIQUE framework could effectively harness ChatGPT's capabilities to strengthen critical thinking, suggesting a promising direction for further research and innovative AI integration in education (Akpan et al., 2024; Celik et al., 2024; Elkot et al., 2025; Judijanto et al., 2024; Wijayati et al., 2024).

Lastly, it was noted that eight out of eleven interviewees in the qualitative phase viewed generative AI as a critical-thinking skill enhancer tool. It was noted that prompt-based applications such as ChatGPT and Meta, as well as an all-around GenAI like Copilot all helped in carving one's critical thinking skill. As previously discovered by Shanto et al., (2024), generative AI ChatGPT indeed strengthened critical thinking, particularly it supported their participants' idea generation and critical analysis compared to working without ChatGPT.

B. Extent on the utilization of Generative AI tools towards the development of 21st-Century Skills of the Respondents in Terms of Literacy Skills

The extent on the utilization of Generative AI tools towards the development of 21st-Century Skills of the respondents in terms of Technology Literacy Skills as reflected in Table 2 had a general assessment of 2.9505 which was interpreted as High extent. The indicator "Utilization of Generative Artificial Intelligence (AI) tools enable me to explore and adapt to new and emerging technological tools quickly" and "Utilization of Generative Artificial Intelligence (AI) tools help me manage digital projects and automate time-consuming processes and repetitive tasks" had the highest means of 2.9604 while the indicator "Utilization of Generative Artificial Intelligence (AI) tools enhance my ability to navigate and operate various digital platforms effective" had the lowest computed mean of 2.9307, but all were interpreted as high extent.

The results shown in Table 2 implied that respondents perceived AI tools as significantly contributing to enhancing technology literacy competencies. This implied that generative AI tools play a significant role in enhancing the respondent's capacity to adapt to the technological demands of the 21st century. The high ratings on indicators such as exploring emerging technologies and automating repetitive tasks suggest that respondents are not only using AI tools but are also becoming more agile, efficient, and innovative in handling digital responsibilities. Moreover, the relatively lower (yet still high) mean score for navigating and operating various digital platforms implies that while AI tools support exploration and efficiency, there may still be a need for focused digital literacy training to ensure users can effectively apply AI across a wider range of digital environments.

Using generative AI is a great way to boost your tech skills in a more natural, hands-on way. Whether you are chatting with tools like ChatGPT, creating images with AI, or experimenting with code assistants, you are not just using technology—you're learning how it works. It is a way to explore, try things out, and even make mistakes without the pressure, which is one of the best ways to learn. As you get better at asking the right questions, checking the information AI gives you, and applying it to real tasks like writing, researching, or solving problems, you are actually building important digital skills. What is even better is that these tools can adapt to how you learn—so you can dive into complex topics at your own pace and get explanations that make sense to you. You can make generative AI work for you, even when you are still learning.

There was a study by Kee et al., (2024) wherein they explored how Generative Artificial Intelligence (GenAI) tools—such as ChatGPT, Midjourney, BricsCAD BIM, and VR/AR software—impacted the development of digital literacy and holistic competencies among Architecture students. It used a mixed-methods approach: a case study of students engaged in a semester-long design studio project and a quantitative survey of 350 undergraduates from universities in Mainland China and Hong Kong.

The study found that students who frequently used GenAI tools showed enhanced skills in conceptual creativity, self-management, and stress tolerance—three core components of the holistic competency framework identified by the World Economic Forum. GenAI integration allowed students to efficiently manage time, reduce academic anxiety, and boost creativity during various stages of architectural design (e.g., ideation, modeling, and presentation).

In the case study, GenAI supported tasks such as text-to-image concept generation, structural design via BIM, immersive VR/AR environments, and 3D printing. These tools not only increased student engagement and collaboration but also streamlined workflows, making complex design tasks more manageable. The survey confirmed that while most students used GenAI tools sparingly (less than 30% of their assignments), those in design-related fields (like Architecture) used them more frequently and effectively. Students reported that GenAI tools helped with time management and moderately reduced anxiety, though regional and disciplinary differences influenced perceptions and usage patterns. The authors concluded that strategic integration of GenAI in curriculum design could support students' digital transformation, improve learning outcomes, and prepare graduates for tech-driven industries (Akpan et al., 2024; Celik et al., 2024; Elkot et al.,

Table 2
Extent on the enhancement of literacy skills through utilization of generative AI (N=101)

Indicator	Mean	Interpretation
Utilization of Generative Artificial Intelligence (AI) tools…		
Enhance my ability to navigate and operate various digital platforms effectively.	2.9307	High extent
Enable me to explore and adapt to new and emerging technological tools quickly.	2.9604	High extent
Help me manage digital projects and automate time-consuming processes and repetitive tasks.	2.9604	High extent
GENERAL ASSESSMENT	**2.9505**	**HIGH EXTENT**

Legend: 3.25 – 4.00 Very High Extent (VHE), 2.50 – 3.24 High Extent (HE), 1.75 – 2.49 Moderate Extent (ME), 1.00 – 1.74 Least Extent (LE)

2025; Judijanto et al., 2024; Kee et al., 2024; UNESCO, 2019; UNESCO, 2019b; UNESCO, 2019c; UNESCO 2021).

Another study also linked generative AI to technology literacy skills development, the study of Kazanidis and Pellas (2024) on how generative AI (GenAI) tools impacted the digital literacy, learning performance, user experience, and satisfaction of undergraduates from two disciplines: Early Childhood Education (ECE) and Computer Science (CS). A total of 66 Greek students participated by completing AI-integrated instructional design projects involving image and video generation using tools like ChatGPT, Jasper, Animaker, and Visla.

Contrary to expectations, ECE students had more prior experience with GenAI tools than CS students. While both groups performed equally well academically, their experiences varied. ECE students rated AI tools as more useful and expressed greater satisfaction, particularly with image and video content creation. CS students, however, showed a higher comfort level due to their technical backgrounds. The study highlighted that AI could support fair learning opportunities across disciplines but emphasized the importance of tailoring AI integration to students' backgrounds and curriculum needs (Akpan et al., 2024; Celik et al., 2024; Elkot et al., 2025; Judijanto et al., 2024; Kee et al., 2024). It also called for further research, especially with more diverse populations and longitudinal designs, and warned of risks like misinformation, ethical concerns, and overreliance on AI (UNESCO, 2019; UNESCO, 2019b; UNESCO, 2019c; UNESCO 2021).

It was noted that only three out of eleven interviewees in the qualitative phase viewed generative AI as a technology literacy catalyst tool. It was noted that ChatGPT was the apparent application used in shaping and improving one's literacy in technology. This was due to the fact that GenAI in the country was just recently a trend—most of the people do not know yet how to utilize or exploit the vast opportunities in GenAI—one of them is this literacy skills honing. Relatively, people are yet to figure out that GenAI can help one learn technology per se or the technology in general.

C. Extent on the Utilization of Generative AI Tools Towards the Development of 21st-Century Skills of the Respondents in Terms of Literacy Skills

The extent on the utilization of Generative AI tools towards the development of 21st-Century Skills of the respondents in terms of Life Skills had a general assessment of 2.8234 which was interpreted as High extent. The indicator "Utilization of Generative Artificial Intelligence (AI) tools enable me to access diverse templates and resources for improved task execution and completion" had the highest mean of 2.9604 while the indicator "Utilization of Generative Artificial Intelligence (AI) tools strengthen my leadership skills by generating transformative ideas for solving challenges" had the lowest computed mean of 2.7030, but all were interpreted as high extent.

The results shown in Table 3 implied that respondents perceive AI tools were significantly contributing to the enhancement of their life skills that was why they rated it with such high extent. They viewed generative AI tools as catalysts and of great help in their leadership and productivity. This implied that AI tools are generally seen by the respondents as beneficial in their professional tasks, especially in their Bureaus.

1) Generative AI Enhances Leadership Skills

The use of generative AI in enhancing one's ability to assign tasks based on team members' strengths and skills, monitor their progress, and provide constructive feedback; the ability to generate transformative ideas for solving challenges; and the ability to enhance my ability to create action plans that align with organizational objectives were some of the evidences that generative AI indeed enhances the leadership skills of the respondents. As seen in Table 3 (statement numbers 1 to 3), the statements concerning enhancement of leadership skills through generative AI obtained a mean range from 2.7030 to 2.8119, interpreted as a high extent of enhancement.

There was a study by Chowdhury et al. (2024) wherein they explored the transformative impact of Generative AI (GAI) on business and human resource management (HRM). It highlighted how GAI technologies challenged traditional HRM frameworks by altering work structures, employee roles, and organizational dynamics. The authors noted that many early AI projects had failed due to poor alignment with business goals, integration issues, and lack of employee collaboration strategies. It can be stated that this focuses more on collaboration skills. However, it is not under the learning school of thought; rather, it is in the leadership umbrella of variables.

GAI stood apart from earlier technologies by generating contextually relevant content and learning continuously from interactions. This led to both new opportunities (e.g., personalized marketing and automated content generation) and new risks (e.g., misinformation, ethical concerns, and regulatory gaps). The paper emphasized that organizations often remained underprepared for the scope and speed of these changes. To address these issues, the authors proposed a strategic HRM framework grounded in institutional entrepreneurship theory. This framework encouraged

Table 3
Extent on the enhancement of life skills through utilization of generative AI (N=101)

Indicator	Mean	Interpretation
Utilization of Generative Artificial Intelligence (AI) tools…		
1. Enhance my ability to navigate and operate various digital platforms effectively.	2.9307	High extent
2. Strengthen my leadership skills by generating transformative ideas for solving challenges.	2.7030	High extent
3. Enhance my ability to create action plans that align with organizational objectives.	2.8119	High extent
4. Enable me to access diverse templates and resources for improved task execution and completion	2.9208	High extent
5. Assist me in creating structured schedules and tracking my progress to manage assigned tasks efficiently.	2.8614	High extent
6. Aid me in refining and editing my work for greater clarity and professionalism, ensuring that my work meets the required standards and expectations.	2.9010	High extent

Legend: 3.25 – 4.00 Very High Extent (VHE), 2.50 – 3.24 High Extent (HE), 1.75 – 2.49 Moderate Extent (ME), 1.00 – 1.74 Least Extent (LE)

organizations to realign their structures and cultures through "re-institutionalization," empowering employees as change agents. The goal was to integrate GAI responsibly, boost innovation, and maintain ethical and inclusive work environments (Chowdhury et al., 2024). They identified eight layers of complexity introduced by GAI: cognitive, structural, relational, ethical, regulatory, techno-centric, socio-cultural, and economic. The study also underlined the need for HR managers to continually upskill the workforce and assess GAI's evolving capabilities, while maintaining human oversight.

Another study also linked generative AI to leadership skills development, the master's thesis of Shields (2024) on how Generative AI (GenAI) influenced leadership in contemporary, technology-driven businesses. While AI had long been used to enhance efficiency, GenAI introduced the ability to create content and make context-aware decisions, raising new questions about how leaders adapted to this capability. The author aimed to analyze how traditional and emerging leadership styles evolved due to GenAI's rise. Through an in-depth literature review and qualitative interviews with C-level and senior professionals across various industries, the study investigated comfort levels, practical applications, organizational maturity, and perceived challenges of GenAI adoption in leadership roles.

Findings revealed that although GenAI adoption remained relatively early-stage, all interviewed leaders had already used it, particularly for administrative efficiency. C-level executives generally felt more comfortable with the technology compared to mid-level managers. US-based leaders appeared more open to integration than those in Europe. The thesis argued that GenAI democratized leadership capabilities, such as pattern recognition and decision-making, by making them accessible to non-experts. It reshaped leadership expectations—especially within strategic, operational, and interpersonal domains—requiring leaders to shift from authoritative roles to coaching and collaboration-based styles. Traditional leadership styles—like autocratic or transactional—were likely to be challenged, while transformational, situational, and servant leadership styles aligned better with the collaborative, data-driven nature of GenAI. A new concept of "AI-enabled leadership" emerged, emphasizing human qualities like empathy, ethics, creativity, and inspiration. The research concluded that to successfully lead in a GenAI-enhanced environment, leaders needed to adapt their skills, embrace lifelong learning, and foster a data-driven and innovation-oriented culture. It recommended that organizations develop leadership frameworks that integrate both human and artificial intelligences responsibly, strategically, and ethically (Akpan et al., 2024; Celik et al., 2024; Elkot et al., 2025; Judijanto et al., 2024; Kee et al., 2024; UNESCO, 2019; UNESCO, 2019b; UNESCO, 2019c; UNESCO 2021).

It was noted that only four out of eleven interviewees in the qualitative phase viewed generative AI as a leadership skill enhancer tool. It was noted that ChatGPT was the usual application that was used in shaping and improving one's leadership skills, mostly in decision making. ChatGPT was said to help in giving situations/ scenarios, and choices that one can evaluate in order to manage people effectively. It was also noted that prompts in a GenAl can lead to intelligent answers—GenAI, although not 100% reliable, has always been referencing to good sources which make its suggestions smart. With all these said suggestions, not only makes leading/ management easy—one can master the trend, eventually leading to acquiring the skill.

2) Generative AI Enhances Productivity Skills

The use of generative AI in enhancing one's ability to enable one to access diverse templates and resources for improved task execution and completion; the ability to assist one in creating structured schedules and tracking my progress to manage assigned tasks efficiently; and the ability to aid one in refining and editing my work for greater clarity and professionalism, ensuring that my work meets the required standards and expectations were some of the evidences that generative AI indeed enhances the productivity skills of the respondents. As seen in Table 3 (statement numbers 4 to 6), the statements concerning enhancement of productivity skills through generative AI obtained a mean range from 2.8614 to 2.9208, interpreted as a high extent of enhancement.

Are prompts in Generative AI contributing even in the aspect of productivity? Yes—they indeed make tasks easier due to practicality in the access of information. But in enhancing productivity as a skill, does it really affect or impact it?

De Smet and his colleagues (2024) stressed that since the launch of ChatGPT in late 2022, interest in Generative AI (GenAI) surged across the business world. In their study, they investigated how GenAI affected productivity and job satisfaction, emphasizing the need to make work more people-centric rather than just efficient. They have surveyed nearly 13,000 workers and executives in North America and the UK, discovering that 88% of GenAI users worked in nontechnical roles, such as managers, educators, and healthcare professionals. Only 12% fell into traditional technical roles like engineers and data scientists. Among the key findings, more than half of GenAI creators and heavy users planned to leave their jobs within three to six months, despite being critical talent. These employees prioritized flexibility, meaningful work, and caring leadership far more than compensation. GenAI enabled many employees to automate repetitive tasks, allowing them to shift toward higher-level cognitive and social-emotional work such as critical thinking, decision-making, and collaboration. Despite these advantages, 55% of heavy users reported experiencing burnout, a rate significantly higher than that of the broader workforce.

The study categorized workers into four distinct types: creators, who built GenAI tools (2%); heavy users, who used GenAI for most of their core job tasks (8%); light users, who used it occasionally (18%); and nonusers, who had little to no exposure to the technology (72%). Interestingly, workers across all categories rated cognitive and interpersonal skills as more important than technological skills—even among technical professionals. However, nontechnical workers showed a declining emphasis on emotional intelligence as their use of GenAI increased, possibly because they had not fully grasped how their interpersonal responsibilities would evolve alongside

the technology.

Their study concluded that while GenAI had the potential to automate up to 30% of tasks by 2030, genuine productivity gains would depend on companies' willingness to redesign jobs in a more human-centric way. Leaders were encouraged to listen more actively to their employees, redefine productivity based on outcomes rather than hours.

There was also a literature review done by Al Naqbi et al. (2024) wherein they reviewed 159 research publications to analyze how Generative Artificial Intelligence (GAI) impacted work productivity across various sectors, including academia, healthcare, engineering, communications, government, and business. It applied a systematic PRISMA methodology to identify patterns, challenges, and opportunities in the application of GAI, especially through tools like ChatGPT and conversational agents.

GAI was found to significantly improve task automation, decision-making, data analysis, and user interaction across professional settings. In academia and research, it enhanced teaching models, administrative efficiency, and student support while raising concerns about ethical standards and academic integrity. In engineering and technology, GAI boosted design processes, early failure detection, and human–machine interaction, leading to safer and more innovative workplaces.

In communications and cultural studies, GAI reshaped user engagement and branding strategies through chatbots, while in tourism and journalism, it optimized customer interaction and content creation. In healthcare, it improved diagnostics, patient care, and efficiency in clinical workflows, though it also introduced challenges related to data privacy and human-AI collaboration.

In agriculture and government, GAI supported precision farming, efficient public service delivery, and disaster response through chatbot systems. Meanwhile, in business management, GAI enhanced productivity, customer experience, and digital transformation across small and large organizations.

The paper emphasized the importance of ethical implementation, upskilling employees, and ensuring that GAI technologies augmented rather than replaced human capabilities. It also highlighted the need for careful design, strategic integration, and responsible governance to maximize GAI's benefits while minimizing risks.

Finally, a bibliometric analysis mapped emerging trends, popular research themes, and interdisciplinary applications of GAI. The study concluded that GAI had the potential to redefine productivity in the workplace, but its successful application required balanced integration, ongoing research, and ethical safeguards across all sectors.

There were nine out of eleven interviewees in the qualitative phase that perceived generative AI as a productivity skill enhancer tool. It was noted that this facet of 21st century skills was the most prevalently influenced and impacted by GenAI, nine out of eleven interviewees view generative AI as a productivity skill enhancer tool. It was noted that ChatGPT was still the usual application that was used in shaping and improving one's productivity skills, mostly in idea generation, streamlining of tasks, and in prevention in spending time and resources in performance tasks of the students. As asserted by De Smet et al. (2024) and Al Naqbi et al. (2024), generative AI technologies are getting smarter every single day—this is the time where humans must accept the technology and integrate/ incorporate it into their daily tasks—because for sure, it surely helps everyone, only use it ethically and responsibly.

D. What Challenges did Public Safety Student Officers Encounter in Utilizing Generative AI?

It has been noted that GenAI is not 100% perfect. Becoming a trend in 2022—reliability speaking, it cannot be said that it is truly reliable, yet. Having this, here are some of the challenges that the participants encountered in utilizing generative AI based on the Qualitative data gathering phase.

It was noted that the perception of a challenge or risk in the utilization of GenAI differs from person to another—depending on their literacy in using it. As seen in Table 4, in the final row, the total tally of challenge perceived differ per participant—their level of literacy/ skill in the use of GenAI may be a factor in their perception of risks and challenges as they use the technology—you can see that some only perceived one challenge and some have perceived up to four risks in their experience of using GenAI.

While generative AI offered transformative potential, it also raised significant ethical and technical challenges that required deliberate and thoughtful approaches for its responsible development and deployment. One major concern involved bias in AI outputs, as models learned from datasets that often-reflected societal biases. This resulted in outputs that reinforced stereotypes or produced discriminatory content. Addressing this issue demanded more diverse datasets, bias detection tools, and refined training methodologies. Another key issue was misinformation, with generative AI contributing to the spread of deepfakes and fabricated content that threatened public trust and social stability. Combating this problem required better detection technologies, public education, and ethical content guidelines. Intellectual property concerns also emerged, particularly regarding the ownership of AI-generated works like music and art, which lacked clear legal attribution. This called for robust legal frameworks to define rights and protect creators. Additionally, the computational costs of training and deploying large models raised sustainability concerns due to high energy consumption. Mitigating this required optimizing model design, using energy-efficient methods, and exploring renewable power sources. Overcoming these challenges depended on collaboration among researchers, policymakers, and industry leaders to ensure AI was developed equitably and sustainably (Pandy et al., 2024; Wijayati et al. 2024).

The integration of generative AI in vocational education, particularly for business communication training, also posed several technical, educational, and infrastructural challenges. Technically, while AI had advanced, it still struggled with accurately interpreting context in complex communication scenarios. This often led to responses that were too generic or culturally inappropriate, increasing the risk of miscommunication. The models' effectiveness was limited by the quality and diversity of their training data, which could

Table 4
Coded responses in the qualitative phase (one-on-one interview) pertaining to the challenges in generative AI utilization
(N=11; verbatim, in conversational Tagalog-English)

Superordinate Theme: Challenges in Generative AI Utilization		
Participant	**Responses**	**Subordinate Theme**
P1	So far, sa literacy naman po, pwede mo na itanong iyon sa ChatGPT. Ang kaso nga lang po, hindi mo sigurado kung legitimate yung sagot ni ChatGPT	Unreliable Information Risk
P1	May freedom ang student pero sa ethics natin kailangan talagang iobserve natin kasi may case din tayo na makakasuhan tayo pag (inaudible) natin kopyahin plagiarism	Plagiarism Risk
P1	Kung baga ideas lang talaga ang kunin natin tapos iwrawrite natin. Hindi lahat ng andun is kokopyahin mo. Kasi, gaya ng nasabi ko, hindi mo sure if legitimate sinasabi ni ChatGPT.	Unreliable Information Risk
P1	Meron din na—kapag nagfact check ka, hindi pala sya legit.	Unreliable Information Risk
P2	…unlike sa chatgpt na kailangan pa na premium account.	Payment Requirement
P2	Dapat malakas din talaga ang internet mo kasi dependent siya sa internet connection eh	Dependence on Internet Connection
P2	Yung sa mga binabayaran lang. Hassle pa kasi na magcoconnect ka ng credit/debit card, given may libre naman.	Payment Requirement
P3	…minsan yan pa yung isa sa mga cases kaya mapapansin niyo madami na din ang nakakasuhan ng plagiarism tapos yung lumalabas na recent cases dun sa mga vlogger natin	Plagiarism Risk
P4	Siguro yung kailangan din yung sinasabing plagiarism.	Plagiarism Risk
P5	Merong misinformation kasi gaya ng sinabi ko nasa intel community ako, nag aask ako ng name ng tao pero ibang information ang binibigay niya although yung pangalan niya na nilagay ko ay siya yun alam ko naman na siya ay graduate ng ganitong school pero yung binibigay niya ay ibang school so hindi rin 100% reliable.	Unreliable Information Risk
P5	kaya dapat hindi mo rin ibibigay lahat ng information kasi yung secrecy ng information delikado din. Ilimit mo din ang pagbibigay mo ng data para hindi masave sa kanyang data base and then pag may nagresearch na ibang tao hindi makukuha yung information about you.	Sensitive/Personal Information Leak
P6	Mostly chatgpt ang nagagamit ko eh kasi yun ang libre, yung iba kasi may bayad eh… Mostly yung free lang kasi dollar din kasi yung bayad..	Payment Requirement
P6	May chance din Ma'am na di accurate o reliable yung source ng sagot ni chatgpt	Unreliable Information Risk
P6	isang challenge din mam yung accessibility meron kasing bayad yung iba kaya hindi na ako nagkukwan yung sa free lang tayo, dollars din kasi ang bayad tapos subscription siya mam. Costly din kasi yung iba may bayad din lalo na sa mga bago ngayon yung deepseek, chatgpt premium.	Payment Requirement
P7	yung iba kasi may bayad din like need mo ng premium account para magamit mo ng maayos yung app	Payment Requirement
P7	Plagiarism can also be rampant as an answer to a single question is given the same answer all the time.	Plagiarism Risk
P7	One of the things that concerns me about using too much generative Al is that I may end up being too dependent on it.	Over-Dependence Risk
P7	Identity theft and other privacy issues can arise using generative Al.	Sensitive/ Personal Information Leak
P8	*Hindi lahat ng sagot na binibigay ng AI ay 100% accurate o applicable,*	*Unreliable Information Risk*
P8	*Isa sa pinakaunang challenge ay hindi laging 100% accurate ang AI-generated content. Minsan may outdated o misleading na impormasyon, lalo na kung hindi verified ang sources.*	*Plagiarism And Unreliable Information Risk*
P9	*Isa na dun yung accuracy ng information—hindi lahat ng sagot ng AI tama o up-to-date, lalo na pagdating sa legal provisions at BJMP policies*	*Unreliable Information Risk*
P9	*Isa pang challenge ay dependence—minsan, dahil sa bilis ng AI magbigay ng sagot, may tendency na umasa na lang dito instead na mag-effort mag-research manually…*	*Over-Dependence Risk*
P9	*May concern din sa data privacy, lalo na kung may AI tools na nagre-require ng personal info or sensitive case details. Syempre, bilang law enforcement trainees, dapat maingat kami sa paggamit ng technology para hindi malagay sa alanganin ang confidentiality ng information*	*Sensitive/ Personal Information Leak*
P9	*Also, yung plagiarism since madali lang siya mag generate ng info and wala nang proper citation*	*Plagiarism Risk*
P10	*Una, may mga pagkakataon na hindi accurate o relevant yung mga results na binibigay ng AI*	*Unreliable Information Risk*
P10	*may concerns rin po sa data privacy kaya kailangan naming siguruhin na hindi kami nagkocompromise ng sensitive information*	*Sensitive/ Personal Information Leak*
P10	*Opo mam, may ethical concerns, lalo na sa plagiarism at intellectual property.*	*Plagiarism Risk*
P11	*Hindi po kasi lahat ng information na lumalabas sa AI ay perfect*	*Unreliable Information Risk*
P11	*ibang AI din na may bayad. Kailangan mo ng subscription or premium account para magamit siya. Kaya dun lang ako sa libre.. hehe*	*Payment Requirement*
P11	*May mga ethical concerns din po akong nakita sa paggamit ng AI, lalo na sa bias ng data. Minsan po, dahil sa kung anong klaseng data ang pinagmulan ng AI, nagkakaroon ng biased perspective, which can be problematic lalo na sa public safety*	*Unreliable Information Risk*

restrict their ability to provide relevant feedback for students across different regions and industries. On the educational front, teacher readiness presented a challenge, as many educators lacked the technical skills or familiarity to effectively integrate AI into their teaching. Resistance to change and insufficient training further hindered adoption. Additionally, aligning AI-driven tools with specific vocational learning outcomes proved difficult. AI modules needed to be adaptable enough to support the varied communication skills required in fields such as healthcare, hospitality, and engineering. This called for careful design and flexibility in AI tools to support diverse educational needs and ensure they enhanced rather than disrupted vocational training (Pandy et al., 2024; Wijayati et al. 2024).

It was also noted that the very solution of the participants in the perceived challenges/ risks was to verify or fact-check their prompts/ entries in the use of GenAI in order to prevent adaptation of unreliable information. Consequently, verification and citing of sources can make the user prevent the commission of plagiarism. It was also noted that there are GenAI other than ChatGPT that offers free services in order to alleviate the requirement of payment. Lastly, one must avoid to prompt personal or sensitive information in order to prevent leak.

4. Conclusion

The findings from both the quantitative and qualitative phases affirm that generative AI plays a significant role in skill development across key domains. It holds strong potential as a transformative tool in enhancing 21st-century skills among public safety officers in training. It reinforces the importance of integrating AI tools strategically within learning environments to maximize their benefit, particularly in improving communication, creativity, critical thinking, and productivity. However, the relatively lower impact perceived in technology literacy and leadership suggests the need for targeted instructional strategies and structured training modules to bridge these gaps. Ensuring that officers are not just users, but also critical and ethical navigators of AI technologies will be essential in preparing them for the demands of modern public service.

The most common challenge in using generative AI among participants were the risks of plagiarism and unreliable information. Other concerns included the need for paid access and potential data privacy issues. Less frequently mentioned were overdependence on AI and reliance on internet connectivity. These findings highlight the need for ethical guidelines, user education, and secure access to ensure responsible and effective AI use especially in the training institute.

Majority of the participants suggested that GenAI be included in the curriculum of their training for the benefit of its future trainees. However, it was noted that GenAI to be introduced as a new subject requires technical knowledge, skill, and mastery in the part of the SMEs (subject matter experts)/ instructors, for them to deliver the subject proficiently and appropriately. As of today, since the trend and the implementation of GenAI classes are not fully established yet in the country's educational sector.

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