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PROFILE AND EXTENT OF USAGE OF GENERATIVE AI OF 21ST CENTURY SKILLS AMONG SELECT ILOKANO TEACHERS

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Abstract

This study investigates the profile and extent of Generative AI usage among Ilokano teachers and its impact on their 21st-century teaching skills. Utilizing a quantitative descriptive correlational design, data were collected from 175 teachers in Aparri and Camalaniugan Districts. Findings reveal varied adoption levels of Generative AI, influenced by age, educational attainment, and access to technology. While teachers recognize AI's potential in enhancing curriculum planning, instructional development, and assessment, proficiency and confidence remain significant challenges. Recommendations include targeted professional development, policy support, integration of AI in pedagogical training, investment in ICT infrastructure, and further research to validate findings and guide continuous improvement in AI integration in education.

Keywords: *Generative AI, 21st-century teaching skills, Ilokano teacher, educational technology, Professional development*

INTRODUCTION

The rapid advancements in technology have ushered in an era of transformation, fundamentally reshaping the educational landscape. Central to this paradigm shift is the rise of Artificial Intelligence (AI), particularly Generative AI, which has become a focal point in educational discourse. Generative AI, characterized by its ability to create diverse materials such as text, images, audio, translations, and synthetic data, promises to revolutionize educational practices by producing such materials in mere seconds.

Aligned with global educational advancements, the Philippines is committed to the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Sustainable Development Goal 4 (SDG 4), specifically aiming to enhance the 21st-century skills of youth and adults. This commitment is exemplified by the establishment of the National Centre for AI Research (N-CAIR), which supports the development of essential 21st-century teaching skills. These skills, encompassing administrative, techno-pedagogical, confirmative, flexible teaching, and productive or generative skills, are crucial for success in today's dynamic educational environments (UNESCO, 2021).

Generative AI, integrated into educational settings, can significantly enhance the efficiency and effectiveness of teaching and learning. According to Kexin (2020), AI optimizes instructional delivery, reducing the workload for both teachers and learners. The 2023 AI Educational Report revealed that 90% of educators view AI as a beacon for more accessible education (AI Educational Report, 2023). Moreover, a 2023 survey by the Walton

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Family Foundation and Impact Research indicated that 51% of teachers use generative AI, with 64% planning to increase their usage due to its benefits in instructional development, pedagogy enhancement, assessment support, and curriculum planning (Walton Family Foundation & Impact Research, 2023).

Despite these advancements, the implementation of Generative AI in education presents a dual-edged sword, offering both significant benefits and potential threats. Teachers, as primary facilitators of knowledge and skill development, are pivotal in integrating AI into pedagogy. Yet, according to UNESCO, less than 10% of schools and universities have formal AI guidance (UNESCO, 2022). The lack of formal guidance from government agencies like the Department of Education (DepEd) and the Commission on Higher Education (CHED) in the Philippines further complicates the situation (Philstar, 2023). Ally (2019) highlighted that only 15% of teachers feel prepared to use Generative AI tools, posing challenges to developing their 21st-century skills.

Concerns about AI's impact on independent thinking, writing, research skills, and overall skill development are prevalent. Surveys such as the Imagine Learning Survey reveal that 60% of teachers worry about the negative impacts of AI on these areas (Imagine Learning, 2023). Studies from institutions like the University of Hong Kong and Monash University emphasize that overreliance on AI tools can hinder skill development, particularly critical thinking and creativity (Chan, 2023; Monash University, 2023). The PISA 2022 results, placing the Philippines second to the lowest, underscore the need for improved teaching skills, which directly affect learner performance (PISA, 2022).

The existing literature on Generative AI in education primarily focuses on ethical issues, with limited exploration of its potential to enhance teachers' 21st-century skills. This study aims to fill this gap by assessing the extent of Generative AI usage among teachers and its impact on their 21st-century skills. The findings will contribute to informed decision-making for the Basic Education Development Program (BEPD) 2030 of the Department of Education and the achievement of UNESCO's 4th target (DepEd, 2023).

Generative AI is an integral part of our educational future. Embracing it can lead to significant advancements and opportunities, enhancing the quality of education and fostering the development of teachers' 21st-century skills. This study investigates teachers' usage levels of Generative AI and its role in shaping the educational landscape, providing evidence-based recommendations to inform education policy and practice.

Statement of the Problem

This study assessed the Extent of Usage of Generative AI and Level of 21st century skills among teachers, specifically, it sought to answer the following questions:

1. What is the profile of the teachers in terms of the following variables?

a. Personal Profile
   i. Age
   ii. Sex
   iii. Monthly Income
   iv. Civil Status

b. Professional Profile
   i. Highest Educational Attainment
   ii. Organizational Affiliation
   iii. Years in service
   iv. Designation
   v. Rank

c. Service Profile
   i. Number of workloads per week
   ii. Total number of students taught
   iii. Number of subjects taught
   iv. Specialization

d. Technological Profile
   i. Access to internet
   ii. Number of devices used at home
   iii. Perceived ICT skills level
   iv. No. of trainings and seminars on the use of General AI tools
   v. Frequency of using Generative AI tools

2. To what extent do teachers use Generative AI in teaching in terms of
   a. Curriculum and planning
   b. Instructional Development
   c. Content Knowledge and Pedagogy
   d. Assessment and reporting of learning

Scope and Delimitation

This study involved the assessment of extent of Generative Artificial Intelligence and level of 21st century skills among teachers. The study was connected to the profile variables of the teachers, their extent of usage of Generative AI, and 21st century teaching skills of teachers which includes Administrative, Techno-Pedagogical, Confirmative, Flexible teaching, and Productive skills or generative skills. The study was limited only to 175 teachers of Camalaniugan and Aparri District.

The respondents are the teachers who are teaching Grades 7 to 12 in any subject area who are currently teaching at Aparri and Camalaniugan Public Secondary schools. They participated in the study through an express informed consent using survey and interview. This study excluded teachers who decline the informed consent to participate in the research activities and individuals who do not meet the inclusion criteria, such as those who are not currently employed in the SDO Cagayan.

There are several delimitations that need to be considered in this study. First, the study is limited to the self-reported extent of usage of the teachers and their perceived 21st Century teaching skills. Second, the study is limited to the SDO Cagayan particularly Camalaniugan and Aparri Area and does not include schools outside of this division. As such, the findings may not be generalizable to other school divisions or regions in the Philippines. Third, the study focused on three specific variables namely the profile, extent of usage of Generative AI and 21st century teaching skills of teachers and does not cover other areas of teachers' competencies. As such, the findings may not provide a comprehensive understanding of the overall extent of usage and 21st century teaching skills of teachers in the SDO Cagayan. Finally, to ensure the validity and reliability of the survey questionnaires, the researcher conducted a pilot test. The data gathered during the pilot test were tabulated and tested its

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Cronbach alpha where it was accepted with a Cronbach's alpha coefficient of 0.812 for Extent of Generative AI usage and 0.964 for 21st century teaching skills. This study was conducted from December to May 2024.

METHODOLOGY

This study employed the quantitative research design using descriptive correlational techniques that aimed to gather the necessary data and information regarding Extent of Usage of Generative AI and 21st century teaching skills among teachers. Descriptive design was used to describe teachers' personal, professional, service profile and technological profile, extent of usage of Generative AI and the teachers' 21st century teaching skills. Furthermore, the research correlated the relationship between the teachers' personal, professional, service profile and technological profile, extent of usage of Generative AI to their level of 21st century skills.

The respondents of the study are the 175 teachers of Aparri and Camalaniugan District. Stratified random sampling was employed in the identification of the respondents. The total number of samples was calculated using the Lynch formula setting the significance at 0.05. From the 310 total actual population of target respondents, 175 was chosen as respondents broken as follows:

Figure 2. Participating school with the corresponding sample of respondents

Name of Schools	Actual Population	Sample
Camalaniugan National High School	127	71
Northern Camalaniugan National High School	16	9
Felipe Tuzon Agricultural School	12	7
Aparri East National High School	87	49
Aparri West National High School	20	12
Bukig National Agricultural Technical School	48	27
Total	**310**	**175**

A survey questionnaire was administered to collect data from participating teachers. The questionnaire comprises of three parts: Part 1 focused on gathering information related to personal, professional service, and technological profiles of the teachers. Part II assesses the extent of teachers' usage of Generative AI in Curriculum and Planning, Instructional Development, Pedagogy. The researcher-made Questionnaire undergone a Cronbach Alpha test to ensure reliability, internal consistency, and validity. The Pilot testing was done at Aparri School of Arts and Trades with 30 teachers as respondents. Cronbach alpha test results shows a coefficient of 0.812 for extent of Generative AI Usage and a coefficient 0.964 for 21st century teaching skills, both of which are acceptable.

For the descriptive part of the study, descriptive statistics was used like frequency counts, percentages, means and standard deviations. These was used in analyzing the profile of the teachers and Extent of usage of Generative AI.

The Extent of Usage of Generative AI was treated using a five-point Likert scale and weighted mean. The interpretation are as follows.

Extent of Usage of Generative AI		
Statistical Limit	**Adjectival Rating**	**Interpretation**
4.20 - 5.00	Always	Very Great Extent
3.40 - 4.19	Often	Great Extent
2.60 - 3.39	Sometimes	Moderately Extent
1.80 - 2.59	Seldom	Low Extent
1.00 - 1.79	Never	Very Low Extent

RESULTS AND DISCUSSION

The results of this study reveal significant insights into the profile and extent of Generative AI usage among Ilokano teachers and their impact on developing 21st-century skills.

Profile of the Teachers

Personal Profile

Table 1a presents the personal profile of teachers in terms of age, sex, civil status and monthly family income. The profile of teachers in terms of age, was categorize into three generation: Generation X (44-59 years old), Millennials (28-43 years old), and Generation Z (12-27 years old). Among the 175 teachers surveyed, the majority belong to the Millennial generation, constituting 72 percent of the sample. Generation X and Generation Z teachers each represent 9.1 percent of the sample. The mean age of the teachers is 35.59 years old, with a standard deviation of 7.91. Millennials, being the largest cohort in the teaching workforce, likely bring a perspective shaped by their upbringing in the digital age. They are more accustomed to technology and innovation, making them potentially more receptive to incorporating generative AI tools into their teaching practices. Millennials, having grown up in the digital era are more open to embracing such technologies to improve efficiency, effectiveness, and productivity in the classroom (Chan, 2023)

In terms of sex, there is a notable gender disparity among teachers, with a higher percentage of females (59.4%) compared to males (40.6%). This observation reflects the broader trends in the global education sector, where women tend to dominate the teaching profession affirmed by the World bank collection of development indicators in 2020 where 87% of teachers are women. In the Philippines, as in many parts of the world, the gender distribution among teachers implies that while the teaching profession predominantly comprises females, the field of technology, including AI development, has historically been male dominated. This gender gap in technology expertise could potentially influence the equitable integration of generative AI in educational settings.

For the civil status of the teachers, the table shows that in relation to the 21st-century teaching and the potential implications of generative AI technology usage, the predominance of married teachers, comprising 67.5 percent of the sample, suggests that a significant portion of educators in the Philippines are likely to have familial responsibilities. This is a crucial aspect to consider in the

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context of 21st-century teaching, where educators are increasingly expected to balance professional commitments with personal obligations. With the advent of generative AI in education, married teachers may find tools powered by AI particularly beneficial in optimizing their time management and instructional strategies, enabling them to efficiently cater to the diverse needs of their students while managing their familial roles. Conversely, the representation of single teachers at 31.4 percent implies a considerable cohort of teachers who may have more flexibility and time to invest in professional development and innovation. These teachers are more inclined to explore and integrate generative AI technologies into their teaching practices, leveraging AI-driven platforms for personalized learning experiences, adaptive assessments, and data-driven insights to enhance student engagement and academic outcomes.

As to the monthly family income of the teachers, it is evident that the majority of teachers belongs to the lower-middle and low-income categories, with 77.1 percent earning between 21,195 to 43,828 pesos per month, and 21.1% earning between 10,958 to 21,194 pesos per month. This shows a concerning picture of the financial situation of teachers in the Philippines, with only a small percentage (1.1%) falling into the middle-class bracket. In the teaching field, where educators are expected to adapt to rapidly evolving educational technologies and methodologies, the financial constraints depicted in the table implies that despite their dedication to providing quality education, teachers in the lower income brackets struggle to afford resources and training necessary for integrating emerging technologies such as generative AI into their teaching practices. The data further implies the urgent need for institutional support to address the socioeconomic disparities among teachers and that it is imperative to empower educators across all income levels to harness the benefits of generative AI and other innovative tools, thereby enhancing the quality and equity of education in the Philippines.

Table 1a. Distribution of the teachers in terms of their personal profile

Personal Profile Variables	**Frequency (n=175)**	**Percentage**
Age (in years)		
Generation X (44 to 59)	33	18.9
Millennials (28 to 43)	126	72.0
Generation Z (12 to 27)	16	9.1
	Mean=35.59 years old	***SD=7.91***
Sex		
Male	71	40.6
Female	104	59.4
Civil status		
Single	55	31.4
Married	118	67.4
Widow	2	1.1
Monthly family income (in Php)		
43, 829 – 76, 669 (Middle class)	2	1.1
21, 195 - 43, 828 (Lower middle)	135	77.1
10, 958 – 21, 194 (Low- income)	37	21.1
Less than 10, 957 (Poor)	1	0.7
	Mean=Php 26,935.94	***SD=6,366.98***

Professional Profile

Table 1b sheds light on the professional profile of the teachers. In the current teaching qualifications in the Philippines, it is notable that a significant portion of teachers have attained masters and doctorate qualifications, with 29.7 percent holding master's degrees and 6.3 percent having achieved doctorate status. This reflects a positive trend towards higher education among educators, which can potentially enhance their pedagogical skills, subject knowledge, and ability to adapt to evolving teaching paradigms characteristic of the 21st century. This also indicates a strong foundation of academic expertise among educators. The educational attainment profile implies a promising foundation. Teachers with higher academic qualifications are likely to possess the critical thinking skills and capacity to incorporate innovative technologies like generative AI into their teaching practices effectively.

In terms of organizational affiliation of the teachers, majority of teachers (88%) are affiliated with PAFTE (Philippine Association for Teacher Education), which reflects a strong institutional connection within the education sector. This affiliation likely fosters collaboration, professional development, and the exchange of innovative teaching practices, all of which are crucial components of effective 21st-century teaching. However, the presence of a considerable portion (10.86%) of teachers without any organizational affiliation suggests a potential gap in access to resources, networking opportunities, and exposure to contemporary teaching methods. Moreover, the minimal representation of teachers affiliated with organizations such as DepEd (Department of Education) and specialized groups like the Agri-Fishery Arts Organization highlights the diversity of educational contexts within the Philippines. While these affiliations may cater to specific subject areas or sectors, they also indicate opportunities for targeted interventions and approaches to integrating generative AI technology in line with the unique needs and priorities of different educational domains.

Based on the years of service, the table categorizes teachers into four groups: those with 11 or more years of service, those with 8 to 10 years, those with 4 to 7 years, and those with 1 to 3 years. Among the surveyed teachers, 21.14% have been in service for 11 years or longer, 12.57% for 8 to 10 years, 50.86% for 4 to 7 years, and 15.43% for 1 to 3 years. The mean year in service is calculated at 7.26 years, with a standard deviation of 4.58. This table holds significant implications that teachers with longer years of service, particularly those with 11 years or more, might possess extensive pedagogical experience and institutional knowledge. However, they might also be less familiar with the latest technological advancements, including generative AI tools, unless they have actively pursued continuous professional development. On the other hand, teachers with fewer years of service, especially those in the 1 to 3-year range, may be more receptive to incorporating innovative technologies like generative AI into their teaching

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practices. They may bring fresh perspectives and a willingness to experiment with new educational tools, potentially fostering a more dynamic learning environment. The data in this table also suggests that there is a relatively small number of beginning teachers in the school. This could is due to the shortage of teachers' item plantilla given to schools as presented by school heads in the triangulation of the study.

As to the profile of teachers in the Philippines categorized by rank, with data showing the frequency and percentage distribution among different ranks. Notably, the majority of teachers fall under the ranks of Teacher III (45.1%) and Teacher II (30.3%), with Teacher I (21.7%) and Master Teacher I or II (2.9%) following behind. Only a minimal percentage of teachers hold the rank of Master Teacher. This distribution underscores the hierarchical structure within the teaching profession in the Philippines, where progression from lower to higher ranks typically involves gaining experience, further education, and meeting specific criteria. In terms of teaching and usage of generative AI in education in the Philippines, this profile presents implications for both educators and policymakers. With a significant portion of teachers holding lower ranks (Teacher III and Teacher II), there might be a need for targeted professional development programs to equip them with the necessary skills and knowledge to effectively leverage technology, including generative AI, in their teaching practices. Furthermore, This could suggest a lack of career progression opportunities in the sample, or a lack of recognition for teachers who have achieved higher qualifications or demonstrated excellence in their teaching (Pagayanan, 2020).

For the teachers' respective designations, the table provides both the frequency and percentage of each designation among a total of 175 teachers. It is notable that the majority of teachers, constituting 69.7%, hold the position of Class Adviser, indicating a significant role in student guidance and mentorship beyond academic instruction. The prevalence of Class Advisers highlights the importance of holistic education and the teacher's role as not just disseminators of knowledge but also as mentors and facilitators of student development in various aspects of their lives. Incorporating generative AI tools could assist Class Advisers in managing administrative tasks more efficiently, allowing them to focus more on personalized student support . The presence of designations such as Coordinators and Organization advisers reflects the increasing integration of technology and service-learning into the curriculum, aligning with the principles of 21st-century teaching that emphasize digital literacy and community engagement.

Table 1b. Distribution of the teachers in terms of their professional profile

Professional Profile Variables	**Frequency (n=175)**	**Percentage**
Educational attainment		
College graduate	73	41.7
With units in a Master's degree	32	18.3
Master's degree graduate	52	29.7
With units in a Doctorate degree	7	4.0
Doctorate graduate	11	6.3
Organizational affiliation		
Phil. Assoc. for Teacher Education	154	88.0
Department of Education	1	0.6
Agri- Fishery Arts Organization	1	0.6
None	19	10.9
Length of service (in years)		
1 to 3	27	15.4
4 to 7	89	50.9
8 to 10	22	12.6
11 or more	37	21.1
	Mean=7.26 years	***SD=4.58***
Faculty rank		
Teacher I	38	21.7
Teacher II	53	30.3
Teacher III	79	45.1
Master Teacher (I or II)	5	2.9
Designation		
Coordinator (Instructional)	12	6.9
DepEd Program Coordinator	13	7.4
Organization Adviser	28	16.0
Class Adviser	122	69.7

Service Profile

Table 1c shows the service profile of the teachers in terms of teaching workloads, total number of students, number of subjects taught and field of specialization. Based on the data, majority of teachers, constituting 58.3%, fall within the range of 26 to 30 hours of teaching per week, with a mean of 29.58 hours and a standard deviation of 5.11 hours. This distribution hints at a significant variance in teaching commitments among educators in the Philippines. With a considerable number of teachers spending around 26 to 30 hours per week on teaching duties, there exists an opportunity to leverage generative AI tools to streamline instructional tasks, automate administrative duties, and enhance teaching effectiveness. Additionally, the data also implies that there is a lack of balance in the teachers' workloads as there are also teachers with an overload teaching workload than those with a regular teaching workload which causes the teachers overreliance to Generative AI in teaching.

Based on the total number of students they handle, showcasing frequencies and percentages across different student count brackets. The distribution suggests a diverse classroom sizes, with a significant proportion (38.2%) of teachers managing between 201 to 250 students, followed by 23.5 percent handling 151 to 200 students. These numbers challenges teachers in providing personalized attention and feedback to each student, a critical aspect of modern pedagogy aimed at catering to individual learning needs. Introducing generative AI tools to the Philippine educational context could assist teachers in managing large class sizes by automating certain administrative tasks, such as grading

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and assessment, thereby allowing educators to focus more on personalized instruction and mentorship. Furthermore, the findings suggest that most of the teachers surveyed had a student-teacher ratio that was greater than the standard size of 35 and that teachers are being stretched beyond what is considered an acceptable ratio. Furthermore, the data reveal that a considerable proportion of teachers (54.3%) are responsible for teaching 2 to 3 subjects. This demands versatility and proficiency across different domains, emphasizing the importance of fostering 21st-century skills such as flexible teaching skills. The table also implies that many teachers are teaching more than one subject in secondary which means that teachers could not focus and put effort on the subject they are teaching, which is their area of specialization, as well as have no more time to devote to their own professional development and well-being (lynch, 2016). Moreover, the field of specialization varies among teachers, with English emerging as the predominant area (29.7%), followed by Mathematics (20.0%) and Science (13.7%). This diversity necessitates for educators to possess both subject expertise and pedagogical skills to deliver quality instruction across various disciplines.

Table 1c. Distribution of the teachers in terms of their service profile

Service Profile Variables	**Frequency (n=175)**	**Percentage**
Teaching workload (in hours per week)		
20 to 25	45	25.7
26 to 30	102	58.3
31 to 35	5	2.9
36 to 40	23	13.1
	Mean=29.58 hours	***SD=5.11***
Total number of students		
80 or below	19	10.9
81 to 160	39	22.3
161 to 240	96	54.9
240 or above	21	12.0
	Mean=185.10 students	***SD=70.77***
Number of subjects taught		
Only 1	76	43.4
2 to 3	95	54.3
4	4	2.3
	Mean=1.86 subjects	***SD=0.87***
Field of specialization		
Filipino	9	5.1
MAPEH	14	8.0
Social Science	16	9.1
Science	24	13.7
TLE/TVL	25	14.3
Mathematics	35	20.0
English	52	29.7

Technological Profile

Apparent in Table 1d is a snapshot of teachers' technological profiles, revealing critical insights into their preparedness for integrating 21st-century teaching skills and the utilization of generative AI. Internet accessibility emerges as nearly ever-present among the surveyed teachers, with 97.1% reporting present access, affirming the fundamental necessity of digital connectivity in modern educational environments. However, the variance in connectivity modes highlights the need for adaptable pedagogical approaches to accommodate diverse technological landscapes, as 82.3% rely on Wi-Fi while 17.7% depend on mobile data.

Moreover, the distribution of devices indicates a significant majority (67.4%) utilize three or more devices, suggesting a potential environment conducive to innovative teaching methodologies and AI integration. The mean of 2.69 devices per teacher underscores the multiplicity of tools available for instructional purposes. Despite this resource abundance, a considerable portion of educators (25.1%) self-identify as beginners in terms of perceived ICT skill level, which may indicate a digital skills gap that could impede effective utilization of generative AI technologies.

Furthermore, the limited exposure to AI-focused seminars or trainings among the surveyed teachers, with 59.4% reporting none, holds a potential barrier to leveraging AI's transformative potential in education. The mean of 0.59 seminars attended suggests a need for targeted professional development initiatives to enhance educators' familiarity and proficiency with AI applications in pedagogy. Addressing this gap is crucial for fostering a generation of teachers equipped with the competencies necessary to harness AI-driven tools effectively, thereby facilitating personalized learning experiences, data-driven decision-making, and adaptive instruction.

In accordance with research, this analysis shows the imperative act for ongoing professional development initiatives patterned to educators' varying technological proficiencies, with an emphasis on fostering advanced ICT skills and promoting AI literacy. By bridging the digital skills divide and cultivating a culture of lifelong learning, educational stakeholders can maximize the potential of generative AI to enhance teaching effectiveness, promote student engagement, and foster innovative learning environments (ISTE, 2017; OECD, 2019; UNESCO, 2020).

Table 1d. Distribution of the teachers in terms of their technological profile

Technological Profile Variables	**Frequency (n=175)**	**Percentage**
Internet accessibility		
Present	170	97.1
None	5	2.9
Connectivity used		
WiFi	144	82.3

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Mobile data	31	17.7
Number of devices used		
1 or 2	57	32.6
3 or more	118	67.4
	Mean=2.69 devices	***SD=0.51***
Perceived ICT skill level		
Beginner	44	25.1
Intermediate	131	74.9
Advanced	0	-
Number of seminars/trainings on AI		
None	104	59.4
At least 1	71	40.6
	Mean=0.59 seminars	***SD=0.79***

Teachers Using Generative AI

Table 1e exposes the frequency and ranking of teachers utilizing various Generative AIs across different domains of 21st-century teaching skills. In Curriculum and Planning, tools like ChatPDF AI and Canva Magic Write hold the top position with 57.1% frequency each, emphasizing their significant role in aiding curriculum development and planning. These findings align with the evolving nature of teaching, where educators are increasingly using AI-powered tools to tailor learning materials and activities to individual student needs and learning styles (UNESCO, 2023). In Instructional Development, Quillbot leads with 51.4% frequency, showcasing the integration of AI in generating instructional materials, which resonates with the call for personalized learning materials and develop interactive educational content (Wang et.al, 2023). Similarly, in Content Knowledge and Pedagogy, ChatGPT emerges as the most utilized tool, highlighting its effectiveness in supporting content creation and pedagogical strategies (Arguson, 2023). Moreover, in Assessment and Reporting, ChatGPT maintains its dominance, indicating its utility in automating assessment tasks and providing personalized feedback, which enhances the efficiency of the assessment process .These findings underscore the growing usage on Generative AIs in various facets of teaching, reflecting the shift towards technology-enhanced pedagogy in the 21st century (OECD, 2019). However, it's crucial to acknowledge the need for careful integration and ethical use of AI in education to ensure alignment with educational goals and principles (UNESCO, 2023). Additionally, further research is warranted to explore the long-term implications and effectiveness of Generative AIs in fostering 21st-century teaching skills and improving educational outcomes.

Table 1e. Number of teachers using the Generative AIs

Generative AI	**Frequency***	**Rank**
Curriculum and Planning		
ChatPDF AI	100 (57.1%)	1.5
Canva Magic Write	100 (57.1%)	1.5
Canva Planner	64 (36.6%)	3
Writer	52 (29.7%)	4
Education Copilot	35 (20.0%)	5
Instructional Development		
Quillbot	90 (51.4%)	1
Slides AI	56 (32.0%)	2
PowerPoint Spkr coach	54 (30.9%)	3
YouTube Summary	49 (28.0%)	4
Content Knowledge and Pedagogy		
ChatGPT	123 (70.3%)	1
Perplexity AI	77 (44.0%)	2
Bing Chat	72 (41.1%)	3
Curipod	69 (39.4%)	4
Jasper	33 (18.9%)	5
Assessment and Reporting		
ChatGPT	141 (80.6%)	1
Grammarly	125 (71.4%)	2
Quiz Wizard	81 (46.3%)	3
Conker	76 (43.4%)	4
Question well	75 (42.9%)	5
Magic School AI	72 (41.1%)	6

**multiple response set*

Extent of Usage of Generative Artificial Intelligence

Table 2a illustrates teachers' extensive usage of generative AI tools in various aspects of curriculum development and planning. Each statement within the table reflects a significant extent of usage of Generative AI into teaching practices. Teachers are leveraging generative AI tools to meticulously craft developmentally sequenced teaching and learning processes that align with curriculum requirements, as indicated by a mean value of 3.66. This utilization ensures that educational content is scaffolded appropriately to meet the needs of diverse learners, reflecting a competency in personalized instruction and differentiated learning strategies. With a mean value of 3.98, educators are using generative AI tools to generate detailed and coherent unit and lesson plans that are meticulously aligned with learning competencies. This approach indicates a mastery of instructional design principles, where technology is harnessed to streamline the planning process while maintaining educational rigor and relevance. Furthermore, the overall weighted mean of 3.83 shows the great extent of usage of Generative AI by the teachers in curriculum and planning. In essence, the high mean value across all statements signifies a widespread integration that holds profound implications for education, empowering educators to optimize teaching and learning experiences, enhance student outcomes, and prepare learners for the complexities of the digital age (Darling-Hammond et al., 2021).

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Table 2a. Teachers' extent of usage of Generative AI in curriculum and planning

Statements	Weighted Mean	Descriptive Interpretation
1. I use or utilize generative AI tools to prepare developmentally sequenced teaching and learning process to meet curriculum requirements.	3.66	Great Extent
2. I use or utilize generative AI tools to generate detailed and coherent unit and lesson plans aligned with learning competencies.	3.98	Great Extent
3. I use or utilize generative AI tools to save and maximize time while personalizing learning pathways for every learner for personalized learning.	3.91	Great Extent
4. I use or utilize generative AI tools to select, develop, and use of a variety of teaching and learning resources, including ICT, to address learning goals.	3.73	Great Extent
5. I use or utilize generative AI tools to implement relevant and responsive learning programs in the learning area.	3.87	Great Extent
Overall weighted mean	**3.83**	Great Extent

Table 2b illustrates the extent to which teachers utilize generative AI tools in instructional development, shedding light on their integration of 21st-century teaching skills. The weighted mean of 3.89 suggests that teachers are incorporating generative AI to a great extent in their teaching practices. Specifically, the means for each statement indicate a consistent pattern of high usage. The mean of 4.04 for statement one indicates that teachers extensively employ generative AI to tailor teaching materials according to learners' diverse needs, aligning with the modern teaching skill of differentiation. This usage is crucial in fostering inclusive learning environments where every student's gender, strengths, interests, and experiences are considered. Moreover, the mean of 3.73 for statement two indicates that educators heavily rely on generative AI to generate and curate content, such as quiz questions and writing scenarios, which aligns with the teaching skill of content curation and customization. By leveraging AI in this manner, teachers can efficiently create engaging and relevant materials that cater to various learning styles and preferences. Overall, the high weighted mean suggests that teachers are adept at integrating generative AI into instructional development, thereby enhancing their ability to meet the diverse needs of 21st-century learners. This underscores the importance of incorporating emerging technologies into educational practices to cultivate essential skills for the digital age (Ibrahim , 2024).

Table 2b. Teachers' extent of usage of Generative AI in Instructional Development

Statements	Weighted Mean	Descriptive Interpretation
1. I use or utilize generative AI tools to make differentiated teaching materials to suit the learners' gender, needs, strengths, interests and experiences.	4.04	Great Extent
2. I use or utilize generative AI tools to generate and curate content and course materials like quiz questions, sample problems, or writing scenarios.	3.73	Great Extent
3. I use or utilize generative AI to rapidly generate text, images, and multimedia elements for e-Learning development.	3.99	Great Extent
4. I use or utilize generative AI tools to complete assignments, activities or writing tasks for instructional development.	3.92	Great Extent
5. I use or utilize generative AI tools to create personalized learning materials for my students.	3.78	Great Extent
Overall weighted mean	**3.89**	Great Extent

Table 2c presents the teachers' utilization of Generative AI tools within the context of content knowledge and pedagogy. Notably, a low mean value of 1.43 for utilizing Generative AI tools to demonstrate knowledge of teaching strategies that do not promote literacy and numeracy skills suggests a limited extent of usage in this area which means that mostly the teachers are using the tools to generate teaching strategies that enhances the literacy and numeracy skills of learners. Moreover, with a weighted mean of 4.18, teachers demonstrate a great extent of employing Generative AI tools to illustrate content knowledge and its application across curriculum teaching areas. This suggests that educators are actively integrating AI technologies into their teaching practices to enhance students' understanding of subject matter. Additionally, with a weighted mean of 3.87, teachers are utilizing these tools to a great extent to showcase positive ICT skills, indicating their adeptness in leveraging technology for facilitating the teaching and learning process.

Overall, the findings indicate that teachers are embracing Generative AI tools to a great extent as revealed in the over- all weighted mean of 3.43 within the parameters of content knowledge

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and pedagogy, leveraging these technologies to enhance teaching practices of teachers (Arguson, 2023)

Table 2c. Teachers' extent of usage of Generative AI in Content Knowledge and Pedagogy

Statements	Weighted Mean	Descriptive Interpretation
1. I use or utilize generative AI tools to demonstrate content knowledge and its application within and/or across curriculum teaching areas.	4.18	Great Extent
2. I use or utilize generative AI tools to showcase skills in the positive use of ICT to facilitate the teaching and learning process.	3.87	Great Extent
3. I use or utilize generative AI rapidly to demonstrate an understanding of research-based knowledge and principles of teaching and learning	3.85	Great Extent
4. I use or utilize generative AI tools to apply teaching strategies that develop critical and creative thinking, and/or other higher order thinking skills.	3.81	Great Extent
5. I use or utilize generative AI tools to demonstrate knowledge of teaching strategies that does not promote literacy and numeracy skills.	1.43	Very Low Extent
Overall weighted mean	**3.43**	Great Extent

Table 2d presents teachers' extent of usage of Generative AI in Assessment and Reporting, with weighted mean values indicating the degree of utilization across various statements. In the 21st century, teaching skills emphasize adaptability, technology integration, and personalized learning, which align closely with the use of Generative AI tools. Based on the data, it shows that there is a low mean values in statements 1 and 4 as revealed by the weighted mean of 3.04 and 3.03 respectively. This highlights the need for enhancing teachers' proficiency in using AI tools to design and implement assessment strategies aligned with curriculum requirements, underscoring the importance of professional development in technological pedagogy (Debarger et. al, 2018). Similarly, statement 5 suggests a potential gap in teachers' usage of Generative AI in providing assessment data for conveying learner needs, progress, and achievement, signaling a need for capacity-building initiatives in this aspect. Furthermore, the over- all weighted mean of 3.17 implies the moderate extent of Generative AI usage in assessment and reporting practices among teachers, which is parallel to the study conducted by Yuchan (2023) that teachers are more cautious in using Generative AI tools.

Table 2d. Teachers'' extent of usage of Generative AI in Assessment and Reporting

Statements	Weighted Mean	Descriptive Interpretation
1. I use or utilize generative AI tools to design, select, organize and use diagnostic, formative and summative assessment strategies consistent with curriculum requirements.	3.04	Moderate Extent
2. I use or utilize generative AI tools to monitor and evaluate of learner progress and achievement using learner attainment data	3.24	Moderate Extent
3. I use or utilize generative AI rapidly provide timely, accurate and constructive feedback to improve learner performance.	3.21	Moderate Extent
4. I use or utilize generative AI tools to demonstrate familiarity with a range of strategies for communicating learner needs, progress and achievement.	3.03	Moderate Extent
5. I use or utilize generative AI tools to demonstrate the role of assessment data as feedback in teaching and learning practices and programs.	3.33	Moderate Extent
Overall weighted mean	**3.17**	Moderate Extent

Conclusions and Recommendations

This study provides a comprehensive analysis of the profile and extent of Generative AI usage among Ilokano teachers and its impact on their 21st-century teaching skills. The findings reveal a diverse range of adoption levels, influenced by factors such as age, educational attainment, and access to technology. While many teachers recognize the potential benefits of Generative AI for enhancing curriculum planning, instructional development, and assessment, there are significant challenges related to proficiency and confidence in using these tools. The study highlights the critical need for targeted professional development and institutional support to fully harness the benefits of Generative AI in education.

In light of these findings, several recommendations are proposed to enhance the effective use of Generative AI among teachers. First, teachers should receive technological enhancement through seminars and hands-on training workshops focusing on interactive, personalized AI activities. Second, policies promoting the use of Generative AI should be adopted at both national and local levels to strengthen 21st-century teaching skills. Third, pedagogical training integrating Generative AI should be included in the continuing professional development programs of the DepEd and

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reflected in School Improvement Plans (SIPs), Annual Improvement Plans (AIPs), and other school program calendars. Fourth, schools should invest in ICT tools and provide technical assistance to support teachers in utilizing Generative AI tools effectively. Finally, a parallel study should be conducted to either refute or affirm the findings of this study, ensuring the continuous improvement of AI integration in education.

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