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Opportunities and Challenges for Information Technology and Business Educators in Implementing Generative Artificial Intelligence in Instruction

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Abstract: ***Generative artificial intelligence (AI) has the potential to revolutionize teaching and learning in the field of IT and business education. This research aims to explore the opportunities and challenges faced by IT and business educators in the utilization of generative AI in teaching and provide insights for educators seeking to harness the power of these tools while mitigating potential risks. The opportunities for IT and business educators in utilizing generative AI include enhanced learning experiences, automation of administrative tasks, exposure to real-world applications, and adaptability and personalization. Generative Artificial Intelligence allows educators to create interactive and personalized learning content, streamline administrative tasks, prepare students for AI-driven careers, and cater to individual learning needs. However, there are several challenges that educators need to navigate to effectively utilize generative AI. Ethical considerations, including data privacy, bias, and the impact of AI-driven decision-making, must be addressed to ensure ethical use of AI technology. Information technology and business educators must also develop the necessary skills and knowledge in AI to integrate it into the curriculum effectively. This requires staying current with advancements in the field. Additionally, the utilization of generative AI may require significant investments in infrastructure, software, and training. Adequate resources must be allocated to support educators in implementing and utilizing generative AI effectively. Lastly, educators must find a balance between AI-assisted teaching and maintaining a meaningful teacher-student relationship. By understanding and addressing these opportunities and challenges, information technology and business educators can harness the potential of generative AI to enhance teaching and learning experiences, prepare students for the AI-driven workforce, and create personalized and engaging educational content. The result of the study serves as basis by the faculty and administrators in strengthening the implementation of generative artificial intelligence in teaching.***

Keywords: Generative AI, Challenges, Educators, Opportunities, IT and Business

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I. INTRODUCTION

In recent years, advancements in artificial intelligence (AI) have paved the way for new opportunities in teaching and learning across various fields, Including Information Technology (IT) and Business Education. One specific area of AI, generative AI, holds immense potential for educators. Generative AI refers to technology that can create new and original content, such as text, images, music, and videos, using machine learning techniques.

As educational institutions embarked with the integration of these advanced generative AI tools, it is important to thoughtfully manage the implementation to ensure enhancement of the learning experience while addressing the inherent challenges.

The emergence of generative artificial intelligence has introduced both opportunities and challenges for information technology and business educators. These AI-powered tools, such as ChatGPT, Fliki AI, and You.com, have the potential to transform the educational landscape by automating the creation of personalized content and enhancing the assessment of complex cognitive performances. (Ruiz-Rojas et al., 2023) [1]. The advent of generative AI tools has opened up new frontiers in the realm of education, offering both opportunities and challenges for instructors. As these tools become increasingly prevalent, it is crucial to understand their impact on instructional practices and devise effective strategies for their management (Ruediger et al., 2024) [2].

As the landscape of education continues to evolve, the emergence of generative artificial intelligence has presented both exciting opportunities and complex challenges for information technology and business educators (Zastudil et al., 2023) [3].

Generative AI can assist educators in generating customized educational resources, tailoring content to individual student needs, and automating routine tasks (Łodzikowski et al., 2024) [4]. However, the successful implementation of these technologies requires careful consideration of various factors, including pedagogical approaches, ethical implications, and educator preparedness. (Mello et al., 2023) [5]. By leveraging generative AI, educators can develop dynamic and engaging content that adapts to students' abilities and preferences, fostering a more effective learning environment.

However, along with these opportunities, IT and business

educators must also navigate several challenges in the utilization of generative AI in teaching [6]. Ethical considerations play a significant role, including concerns about data privacy, the potential for bias in AI-generated content, and the impact of AI-driven decision-making on social and ethical norms (Hadj et al., 2020) [7]. It is crucial for educators to address these ethical issues and ensure the responsible and ethical use of AI technology in the educational context.

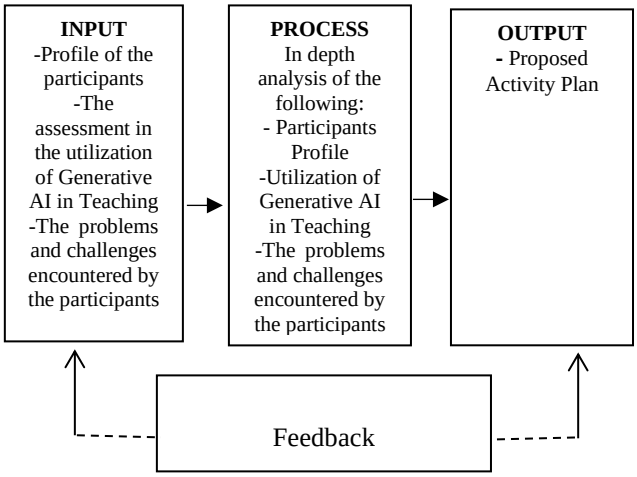
Furthermore, the successful integration of generative AI requires educators to develop the necessary skills and knowledge in AI [8]. Staying current with advancements in the field and continuously updating teaching practices are essential to effectively incorporate generative AI into the curriculum (Chiang et al., 2019). This requires investment in professional development and training opportunities for educators.

Moreover, implementing generative AI may require significant investments in infrastructure, software, and training resources [9]. Adequate technical support and resources must be available to assist educators in integrating and utilizing generative AI effectively. Without sufficient support, educators may face barriers in accessing and implementing AI technologies in their teaching practices.

Lastly, striking the right balance between AI-assisted teaching and maintaining meaningful teacher-student relationships is crucial. While AI can enhance the learning experience, it should not replace the human interaction and guidance that are essential for effective education (Purushothaman & Sandhu, 2021). Educators must find ways to leverage generative AI while still providing personalized and individualized attention to students.

The utilization of generative AI presents both opportunities and challenges for IT and business educators. By understanding and addressing these opportunities and challenges, educators can harness the potential of generative AI to enhance teaching and learning experiences, prepare students for the AI-driven workforce, and create personalized and engaging educational content. However, it is crucial to navigate ethical considerations, acquire the necessary skills and knowledge, allocate sufficient resources, and maintain a balance between AI-assisted teaching and human interaction to maximize the benefits of generative AI in education.

A. Paradigm of the Study



[Fig.1: The Paradigm of the Study]

As shown in Figure 1, the Input-Process-Output framework illustrates a schematic presentation of the inputs (i.e., data and/or requirements) that were analyzed, processed, and used in the proposed plan of action.

The Input. The input of the study contains the profile of the participants, an assessment of the utilization of generative AI by the participants, and the challenges and problems encountered by the utilization of Generative AI in teaching.

The Process. The process of conducting this study consists of the in-depth analysis of the participants' profiles, assessment of the participants in the utilization of Generative AI in teaching, and the challenges and problems encountered by the participants in the utilization of Generative AI in teaching.

The Output. The output of the study is the proposed plan of action in the implementation of Generative AI in Teaching.

Statement of the Problem

This study aims to assess the IT and Business Educators utilization of Generative AI in Teaching.

Specifically, the study aims to answer the following questions:

1. What is the profile of the participants in terms of the following:

1.1 age
1.2 gender

2. What is the profile of the participants in terms of the following:

2.1 age
2.2 gender
2.3 highest educational attainment
2.4 number of years in service?

3. What is the extent of the utilization of Generative AI in teaching by the It and Business Educators in terms of the following:

3.1 learning materials
3.2 teaching delivery
3.3 assignment and performance task

4. Is there a significant difference in the extent of utilization of Generative AI in teaching by IT and Business Educators when grouped according to profile variables?
5. What are the problems and challenges encountered by the participants in the utilization of Generative AI in teaching by IT and Business Educators?
6. What activities can be proposed to address the problems and challenges encountered by the participants in the utilization of Generative AI in teaching?

II. METHODOLOGY

A. Research Design

This study utilized the explanatory sequential mixed method of research employing both quantitative and qualitative research designs. Specifically, the quantitative method was used to assess the extent of utilization of generative AI in teaching particularly in developing learning materials, teaching delivery, and for the assignments and performance tasks.

The qualitative method was used to describe the profile of the participants with respect to age, gender, highest educational

attainment, and number of years in the service. The qualitative method was used to analyze the problems encountered by the participants in the utilization of generative AI in teaching.

The integration of both the quantitative and qualitative data analysis was used as a basis for the development of the activity plan for better implementation of the Generative AI.

B. Participants of the Study

The subjects of this study were faculty members of St. Paul University Philippines in the School of Information and Technology (SITE) and the School of Business Accountancy and Hospital Management (SBAHM).

The table below shows the summary of the participants.

Table 1: Frequency and Percentage Distribution of the Participants

Participants	Frequency	Percentage
SITE Faculty	11	40.74
SBAHM Faculty	16	59.26
TOTAL	27	100.00

C. Instrumentation

In the design and development of proposed activity plan, the researchers utilized the following data gathering techniques to obtain sufficient data regarding the research study:

This questionnaire was self-made.

The overall design of the questionnaire is presented into three (3) parts:

Part 1: The participant's profile.

Part 2: Assessment of the utilization of IT and Business educators in the utilization of Generative AI.

Part 3: The problems and challenges encountered of the participants in the utilization of Generative AI in teaching.

Additional information used in the discussion of the results will be obtained through secondary sources such as previous papers, dissertation research, publications, and articles related to the study.

D. Data Gathering Procedure

To obtain the data needed for the investigation, the following procedures were undertaken by the researcher.

1. The researchers obtained clearance from the Ethics Review Committee of St. Paul University Philippines to ensure the ethical soundness of the research.
2. After obtaining clearance from the Ethics Review Committee, he/she sought the endorsement from the Dean for data gathering.
3. Then, he/she asked permission from the St. Paul University Philippines administrators for the conduct of the study.
4. Before the data collection, the validity of the research tools was established, and the identification of the study participants will be undertaken.
5. Informed consent from these participants was likewise be sought to ensure that the study conforms to the ethical norms of research.
6. Upon approval of the university management, the researchers conferred with the persons involved in gathering the data. The following are the details of the processes involved in obtaining the specific data:

Administration of the Questionnaire. The questionnaire was administered online through the google forms.

7. The obtained quantitative data was organized through the Excel spreadsheet and was subjected to statistical treatment using the SPSS. The qualitative data were analyzed through thematic analysis.
8. Moreover, the research ensured data privacy by safeguarding the anonymity and confidentiality of the data, and regulating the data access, data security, and data disposal.

E. Data Analysis

The data obtained were tallied and treated using the following statistical tools:

Frequency Count and Percentage. This was used to describe the profile of the participants.

Mean. This was used to determine the assessment of the utilization of IT and Business Educators in teaching. To interpret the means, the following scale was used:

Table 2: Scale for Interpreting the Means

Weight/Scale	Mean Range	Descriptive Interpretation
4	3.25-4.00	Very Great Extent
3	2.50-3.24	Great Extent
2	1.75-2.49	Moderate Extent
1	1.00-1.74	Low Extent

ANOVA. The one-way ANOVA was used to test the significant difference in assessment of the participants utilization of IT and Business Educators in the utilization of Generative AI in Teaching.

Thematic Analysis was used utilized to analyze the answers on the problems and challenges encountered by the participants in the utilization of generative AI in teaching.

III. RESULTS AND DISCUSSION

A. Profile of the Participants

Table 3: Frequency and Percentage Distribution of the Participants when Grouped According to Age, Gender, Highest Educational Attainment and Number of Years in the Service

Variable		Frequency	Mean
Age	above 51 years old	6	22.22
	41-50 years old	8	29.63
	31-40 years old	9	33.33
	20-30 years old	4	14.82
Gender	Male	6	22.22
	Female	21	77.78
	Prefer not to say		
Highest Educational Attainment	Doctorate Degree	12	44.44
	Masteral Degree	10	37.04
	Bachelor's degree	5	18.52
Number in the Years of Service	above 20	12	44.44
	11-20	2	7.41
	6-10	7	25.93
	0-5	6	22.22
Total		27	100

Table 3 shows the frequency and percentage distribution of the participants when grouped according to profile variables (age, gender, highest educational attainment, and number of years in the service).

As seen from the table in terms of age, most or 33.33% of the participants are within the range

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of 31-40 years old. In gender, majority or 77.78% of the participants are female. With regards to the highest educational attainment, most or 44.44% of the participants have a Doctorate degree. Moreover, most or 44.44% of the participants have been in the service above 20 years.

B. The Extent of Utilization of Generative AI in Teaching of IT and Business Educators

i. Learning Materials

Table 4: Mean and Descriptive Interpretation on Assessment of the Extent of Utilization of Generative AI in Teaching of IT and Business Educators in terms of Learning Materials

Learning Materials	Mean	Descriptive Interpretation
Automated video	2.70	Great Extent
Research aid in analyzing data sets and the like	2.70	
Virtual assistant in creating lesson plan, projects & teaching framework	2.78	
Tailored curriculum integrating new technologies in teaching	1.26	Low Extent
Online language learning platforms, educational tools	3.07	Great Extent
Category Mean	2.30	Moderate Extent

Table 4 presents the mean and descriptive interpretation of the participants' assessment of the extent of utilization of Generative AI in terms of learning materials

The category mean for this indicator is 2.30 with a descriptive interpretation of "moderate extent". The indicators "Virtual assistant in creating lesson plan, projects & teaching framework" obtained the highest mean of 2.78.

This finding is supported by Chen and Yang (2020) found that moderate use of AIce learners' intrinsic motivation resulting in better learning outcomes. The study highlights the potential of AI to create better learning outcomes through personalized and engaging learning materials.

ii. Teaching Delivery

Table 5: Mean and Descriptive Interpretation of the Participants' Assessment of the Extent to which the Utilization of IT and Business Educators Utilization of Generative AI in Terms of Assignment and Performance Task

Teaching Delivery	Mean	Descriptive Interpretation
MS Teams	3.59	Very Great Extent
Google Bard (google products eg. Google lens, gmail, google meet)	3.11	Great Extent
Interactive and Engaging activities and simulations	3.04	
Zoom AI Companion	2.26	Moderate Extent
LMS using Moodle	2.37	Moderate Extent
Category Mean	2.87	Great Extent

Table 5 presents the mean and descriptive interpretation of the participants' assessment of the extent of utilization of Generative AI in terms of teaching delivery.

The category mean for this indicator is 2.87 with a descriptive interpretation of "very great extent". The "MS Teams" indicator has the highest mean of 3.59.

This means that generative AI is utilized by the IT and Business Educators. However, there are some generative AI that need to be learned in teaching delivery.

iii. Assignments and Performance Tasks

Table 6: Mean and Descriptive Interpretation of the Participants' Assessment of the Extent to which the Utilization of IT and Business Educators Utilize of Generative AI in terms of Assignments and Performance Tasks

Assignments and Performance Tasks	Mean	Descriptive Interpretation
Real time assessment and feedback through MS teams (assignments, quiz, test portal)	3.59	Very Great Extent
Coursera coach AI tutor provides personalize feedback	3.11	Great Extent
ChatGPT or DALL-E/MS365 Copilot	3.04	
Chatbot (immediate response to queries)	2.26	Moderate Extent
Test Portal AI (question generator from text and files)	2.37	
Category Mean	2.87	Great Extent

Table 6 presents the mean and descriptive interpretation of the participants' assessment of the extent utilization of Generative AI in terms of assignments and performance tasks.

The category mean for this indicator is 2.87 with a descriptive interpretation of "very great extent". The indicators "Real time assessment and feedback

through MS teams (assignments, quiz, test portal)" obtained the highest mean of 3.59.

This means that generative AI is greatly utilized by the IT and Business Educators. Educators need to study more of the available generative AI in managing assignments and performance tasks.

C. Test for Significant Difference in the Assessment of the Participants of Utilization of Generative AI in Teaching When Grouped According to Profile Variables

Table 7: Test for Significant Difference in the Assessment of The Participants on the Utilization of Generative AI in Teaching When Grouped According to Profile Variables

Dimension	Profile		Mean	P-Value	Decision
LEARNING MATERIALS	Age	20-30 years old	2.95	0.87	Accept Ho
		31-40 years old	2.89		
		41-50 years old	2.85		
		above 51 years old	2.83		
	Gender	Female	2.88	0.95	
		Male	2.87		
	Highest Educational Attainment	Bachelor Degree	2.84	0.92	
		Masteral Degree	2.90		
		Doctorate Degree	2.88		
	Number of years in the service	0-5	2.90	0.70	
		6-10	3.00		
		11-20	3.10		
		above 20	2.77		

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TEACHING DELIVERY	Age	20-30 years old	2.80	0.92	Accept Ho
		31-40 years old	2.93		
		41-50 years old	2.78		
		above 51 years old	3.00		
	Gender	Female	2.92	0.57	
		Male	2.73		
	Highest Educational Attainment	Bachelor Degree	2.8	0.95	
		Masteral Degree	2.90		
		Doctorate Degree	2.88		
	Number of years in the service	0-5	2.92	0.83	
		6-10	2.75		
		11-20	2.75		
		above 20	2.54		
ASSIGNMENTS AND PERFORMANCE TASKS	Age	20-30 years old	3.00	0.05	Reject Ho
		31-40 years old	2.93		
		41-50 years old	2.28		
		above 51 years old	2.53		
	Gender	Female	2.54	0.04	
		Male	3.07		
	Highest Educational Attainment	Bachelor Degree	3.04	0.10	Accept Ho
		Masteral Degree	2.72		
		Doctorate Degree	2.47		
	Number of years in the service	0-5	2.93	0.03	Reject Ho
		6-10	3.06		
		11-20	3.00		
		above 20	2.20		

Table 7 presents the results of the test of significant difference in the assessment of the participants in the utilization of Generative AI in Teaching when grouped according to profile variables.

As shown in the table, the probability values when grouped according to profile variable, the p-values are greater than 0.05 the null hypothesis is accepted. Therefore, there is no significant difference in the assessment of the participants in the utilization of Generative AI in teaching in the terms of the preparation of the learning materials and teaching delivery.

However, in terms of the preparation of assignments and performance tasks particularly the variables age, gender, and number of years in the service, the p-value are lesser than 0.05 thus the null hypotheses are rejected. This means that there are significant differences in the extent of utilization of Generative AI in teaching in the preparation of Assignments and Performance tasks by the participants.

D. Problems and Challenges

The following are the encountered problems and challenges of the participants in the utilization of of generative AI in teaching:

i. Problems

Lack of resources. Transitioning to generative AI needs sufficient allocation. This includes availability of generative AI software and slow internet connection.

Lack of Generative AI Familiarity. The orientation of the educators on the use of Generative AI in teaching, preparing learning materials, and how to utilize it in concepts, complexity and automation.

Lack of time to be creative and resourceful. The educators have no sufficient time to explore the Generative AI available for teaching delivery, lesson preparation, and in assignment and task performance.

Dependency on Technology. The digitization and automation in relation to teaching tend educators rely much on AI in preparing lessons and exams leading them to become lazy.

ii. Challenges

Adaptation of Educators to New Technologies in Teaching. The reason teachers are hesitant to changes and digitization is due to difficulty in adapting to technology.

Students are more technology savvy than their teachers. The students are more advanced on the use of new technologies than their teachers.

Fear of losing human relation with students. The interaction between the teacher-student diminishes learning due AI assisted learning and dependency in technology.

Expensive Software and Infrastructure. Generative AI tools are expensive that requiring subscription to be able to utilize them in teaching and educators cannot afford them.

Fear on the Ethical Consequences. The participants ethical concerns related to plagiarism, copyright infringement, bias in generated content and responsibilities to maintain academic integrity and fairness in teaching practices.

E. Proposed Activity Plan

- Conduct re-orientation on the concept and real-life applications of Generative AI in business and IT and its significance in various fields.
- Conduct hands-on training workshop of Generative AI tools in developing learning materials, teaching delivery, assignments and performance task.
- Develop learning materials, assignments and performance task using Generative AI.

IV. CONCLUSION

Based on the results of this study, the researchers has came up with the conclusions The integration of generative AI in the classroom can enhance the learning experience by enabling personalized and adaptive teaching methods. It can provide students with real-time feedback and support, making learning more engaging and dynamic. Generative AI can assist educators in designing and developing interactive and immersive learning materials that cater to different learning styles, thereby improving student comprehension and knowledge retention. It can also facilitate the automation of administrative tasks and grading processes, saving time for educators and allowing them to focus more on teaching and mentoring students

The adoption and utilization of generative AI in teaching also pose challenges for IT and business educators. One key challenge is the need for educators to acquire the necessary skills and knowledge to effectively

use and integrate generative AI tools and technologies in their teaching practices. This requires substantial professional development and lifelong learning initiatives to ensure that educators keep pace with the rapid advancements in AI technology.

Additionally, concerns about data privacy, security, and ethical implications need to be thoroughly addressed when integrating generative AI in teaching.

Furthermore, widespread adoption of generative AI in education requires significant investment in infrastructure and resources. This includes providing adequate access to reliable internet connections, appropriate hardware and software platforms, and ongoing technical support for educators and students.

V. RECOMMEDATIONS

Based on the findings and conclusions, the researchers hereby present the following recommendations:

1. *The School Administrators* should ensure that the use of generative AI aligns with ethical guidelines, respects student privacy, and fosters a balance between digital tools and human interaction in the learning process. Additionally, professional development and training should be provided to teachers to facilitate the effective integration of AI technologies into teaching practices.

2. *The Instructors/ Teachers* need to familiarize themselves with Generative AI and apply in education. Identify Learning Gaps to help in tailoring instructions encourage creativity to explore new possibilities to engage students and to foster student independence to be integrated into the classroom to support student learning. Collaborate with Peers to share best practices, resources, and experiences to enhance teaching practices.

3. *The Researchers may* present the plan of activities to the administrators and teachers/instructors to adapt to new technologies in education.

4. *Future Researchers* may consider this study as a basis for similar work and may incorporate more artificial intelligence utilization in education.

DECLARATION STATEMENT

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

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- **Funding Support:** This article has not been sponsored or funded by any organization or agency. The independence of this research is a crucial factor in affirming its impartiality, as it has been conducted without any external sway.
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- **Data Access Statement and Material Availability:** The adequate resources of this article are publicly accessible.
- **Authors Contributions:** The authorship of this article is contributed equally to all participating individuals.

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AUTHORS PROFILE

Dr. Cherry Anne N. Gumabay is a dedicated educator and researcher in the field of Information Technology and Business Education. Her work explores the integration of cutting-edge technologies, including generative artificial intelligence, into pedagogical practices. Dr. Gumabay is passionate about fostering innovative teaching and learning experiences, and her research focuses on the development and implementation of effective strategies for utilizing AI tools in education. She is a strong advocate for ethical considerations and responsible AI use, emphasizing the importance of transparency, critical thinking, and human-centered design in educational applications of AI. Dr. Gumabay's contributions to the field provide valuable insights for educators navigating the evolving landscape of AI in higher education.

Dr. Maria Visitacion N. Gumabay is an educator and a researcher in the field of Information Technology and Business Education. Her research focuses on the integration of emerging technologies, including artificial intelligence, into pedagogical practices. She has extensive experience in curriculum development and teacher training, with a particular emphasis on preparing educators to effectively utilize AI tools in instruction. She is a strong advocate for ethical and responsible AI implementation in education, emphasizing the importance of transparency, critical thinking, and human-centered design. Dr. Gumabay's work contributes significantly to the ongoing discourse on the transformative potential of AI in shaping the future of education.