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Original Research Article

Benefits and challenges of utilizing Chat-GPT and Gamma.app in teaching, learning and assessment of vocational students in 21st century colleges of education in Enugu State

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Abstract

The study aimed at assessing the benefits and challenges of utilizing ChatGPT (Generative Pre-trained Transformer) and Gamma.app during teaching, learning and assessment of vocational students at 21st Century Colleges of Education in Enugu State. The study used descriptive survey research design, was guided by three research questions and had a population of 120 respondents; comprising 60 vocational educators and 60 vocational education students who were selected from 3 Colleges of Education. A 3-sectioned questionnaire comprising closed-ended itemized questions with a four-point Likert-type rating scale was developed and used to elicit the opinions of the respondents on each item statement. Data collected were analyzed using mean and standard deviations. The findings of the study show that both vocational educators and vocational students were of same opinion (no significant difference in opinions) on utilizing ChatGPT and Gamma.app during teaching, learning and assessment such as preparing lecture contents and doing assignments. Both groups' responses having an average mean score above 2.50 is a clear indication that ChatGPT and Gamma.app should be utilized during teaching, learning and assessment. The study highlighted 16 benefits of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of 21st century vocational education students. The study also highlighted 12 challenges militating against utilization of ChatGPT and Gamma.app to include; lack of internet network infrastructure, lack of technical support, lack of training and support of lecturers, challenges with cheating during online assessment, limited time to complete course content, high level societal digital illiteracy, mass poverty among citizens, the absence or total lack of electricity and poor planning.

Keywords: *Teaching, learning, assessment, ChatGPT, Gamma.app, vocational education*

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Introduction

Vocational education generally refers to the study of technologies and related sciences and obtaining of practical skills, attitudes, understanding and knowledge relating to works in various sectors of economic and social life (1). Regrettably, vocational education curricula in Nigeria are seldom reviewed or updated to accommodate the tremendous technological innovations and changes that are occurring during this era of the 4th Industrial Revolution (15) accompany. Also, many of the vocational educators may take a long time before getting acquainted with the updated versions of practical vocational projects and may also be limited by time. Evidently, in the wake of all the potentially glaring contributions of vocational education in Nigeria, prioritizing its teaching, learning and assessment, leveraging on Chat-GPT and Gamma.app could improve content delivery, skills acquisition and efficient achievement of desired learning outcomes. This has not been given adequate attention. Chat-GPT and Gamma.app could offer both the teachers and the students equal and unlimited access to vocational educational resources in different formats.

Thus, in the current tech-driven world, not using AI tools such as Chat-GPT and Gamma.app in teaching and learning may not capture the creative, productive and social potential of vocational students at 21st century colleges of education in Enugu State (8). Hence, exploring the use of Chat-GPT and Gamma.app tools, in addition to the curriculum content, could provide new insights into how 21st century students develop skills in problem-solving, critical thinking and collaboration. For instance, Chat-GPT (Generative Pre-trained Transformer) has been designed to simulate human-like conversation. It can also be used in a variety of applications including chatbots, virtual assistants, and language translation tools. Gamma.app is also a powerful tool that has the potential to transform the way students interact with technology, enabling more natural and intuitive communication between the students and learning aids.

The main purpose of this study is to identify the benefits and challenges of utilizing ChatGPT and Gamma.app in the teaching, learning and assessment of vocational students at 21st Colleges of Education in Enugu State. Specifically, the study assessed:

1. The opinions of vocational educators and vocational students on the utilization of ChatGPT and Gamma.app in teaching, learning and assessing of vocational students at 21st-Century Colleges of Education in Enugu State.
2. The benefits of utilization of ChatGPT and Gamma.app in teaching, learning and assessing of vocational students at 21st-Century Colleges of Education in Enugu State.
3. The challenges of utilization of ChatGPT and Gamma.app in teaching, learning and assessing of vocational students at 21st-Century Colleges of Education in Enugu State.

The following research questions guided the study:

1. What are the opinions of vocational educators and vocational education students on the utilization of ChatGPT and Gamma.app during teaching, learning and assessment of Vocational students at 21st century Colleges of Education in Enugu State?
2. What are the benefits of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of Vocational students at 21st century Colleges of Education in Enugu State?

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3. What are the challenges of utilizing ChatGPT and Gamma.app on Vocational students during teaching, learning and assessment at 21st century Colleges of Education in Enugu State?

Hypotheses

Three null hypotheses were formulated for the study. They include:

HO2: There is no significant difference in the mean rating of vocational educators' opinions and vocational educational students' opinions on utilizing ChatGPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State.

HO2: There is no significant difference in the mean ratings of the benefits of utilizing ChatGPT and Gamma.app during teaching, learning and assessment for vocational educators and vocational education students.

HO3: There is no significant difference in the mean ratings of the challenges of utilizing ChatGPT and Gamma.app during teaching and learning assessment of vocational educators and vocational education students.

Materials and Methods

Research design

The study adopted a descriptive survey research design. Descriptive survey design is a type of research design used to obtain vital facts about people, their beliefs, opinions, attitudes and behavior. According to (2), descriptive survey design is the representative sample of the population, consisting of individuals of different ages. Their concern is to either describe or interpret existing relationships, attitudes, and practices, processes and trends, or compare variables. This design was considered to be most appropriate and suitable for this study, as it enabled the researchers to gather the opinions of vocational educators and vocational education students, while exploring the benefits and challenges of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education.

This study elicited information from 60 vocational educators and 60 vocational education students from the following three following Colleges of Education: Federal College of Education, Eha-Amufu, Enugu State; Enugu State College of Education (Technical), Enugu, Enugu State, and Ebonyi State College of Education, Ikwo, Ebonyi State.

Population of the study

The population for the study included vocational educators and vocational education students across the four departments in Schools of Vocational Education at the three selected Colleges of Education. This was sourced from the Personnel and Admission Units of the three Colleges of Education. Also, since the population of this study was of manageable size, no sampling methods were used by the researchers.

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Population distribution

Table 1: Population distribution

S/No	Institution	Departments	Vocational educators	Vocational education students
1.	Federal College Education, Eha-Amufu, Enugu State	Agricultural Education	5	5
		Business Education	5	5
		Home Economics Education	5	5
		Fine & Applied Arts Education	5	5
2.	Enugu State College of Education Technical, Enugu State	Agricultural Education	5	5
		Business Education	5	5
		Home Economics Education	5	5
		Fine & Applied Arts Education	5	5
3.	Ebonyi State College of Education, Ikwo, Ebonyi State	Agricultural Education	5	5
		Business Education	5	5
		Home Economics Education	5	5
		Fine & Applied Arts Education	5	5
	Total		60	60
	Grand total		120	

Instrument for data collection

The instrument used for data collection in this study was a structured questionnaire titled "Benefits and Challenges of Utilizing ChatGPT and Gamma.app during Teaching, Learning and Assessment of vocational students at 21st century Colleges of Education in Enugu State". This was developed based on extensive review of related literature and on the purpose of the study. The instrument was divided into three sections, A, B and C. Section A elicited information on opinions of vocational educators and vocational education students on utilizing ChatGPT and Gamma.app during teaching, learning and assessment of 21st century vocational education students, while section B contains 16 questions that relate to the benefits of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of 21st century Vocational education students. Finally, section C contained 12 itemized questions on the challenges of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of Vocational students at 21st century Colleges of Education in Enugu State. The respondents were to tick against the desired response category, based on their opinions. The questionnaire was structured to elicit the opinions of the respondents on the item statements, based on a 4-point rating scale that was assigned four-point numerical values that were measured in this study. Thus:

Scale Items	Numerical Points
Strongly agree (SA)	4
Agree (A)	3
Disagree (D)	2
Disagree (SD)	1

Therefore, items with mean scores of 2.50 and above were accepted as agreed, while items with mean score below 2.50 meant disagreed.

Note: A total score of 10 (i.e. 5 vocational educators and 5 vocational education students used from each of the Departments from each selected educational institution) was divided by the number of Likert points (i.e. 4 points) to determine the threshold of 2.5.

Validation of the instrument

The instrument was face-validated by three experts from Departments of Curriculum Development, Agricultural Education and Business Education, all of the Federal College of Education, Eha-Amufu, Enugu State. Corrections were made on appropriateness of language, relevance to subject matter, precision of items and ambiguity of statement. The Reliability Coefficient (RC) obtained using the Cronbach Alpha reliability test (10a) was 0.79.

Data collection techniques and analysis

Distribution and collection of the instrument was done by hand through the co-ordination of the researchers. The entire 120 copies of the questionnaires were retrieved and analyzed. Data collected were analyzed using percentage, mean and standard deviation.

The following decision guided the interpretation of the results of the analysis. Any item with a mean score of ≥ 2.5 was regarded as agreed, while any mean score of less than 2.50 was regarded as not agreed or disagreed. The hypotheses of no significant difference (Ho) were upheld for any item whose t-calculated value is less than the t-table value of 1.96 at probability of 0.05 level of significance and 38 degrees of freedom. In the alternative, the null hypotheses of no significant difference were rejected for any item whose t-calculated was higher than the t-table value at probability of 0.05 level of significance.

Results

Research question 1: *What are the opinions of vocational educators and vocational education students on utilizing ChatGPT and Gamma.app during Teaching, Learning and Assessment of vocational students at 21st century Colleges of Education in Enugu State?*

Table 1: Mean responses and standard deviation on the opinions of vocational educators and vocational education students on utilizing ChatGPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State.

Enrollment in local colleges, 2005

S/N	ITEM	X1	X2	SD1	SD2	t-cal	t-tab	Decision
1.	X & Y are a valuable tool for reinforcing real-world application of knowledge, helping students see the practical relevance of what they learn.	3.39	3.35	0.56	0.58	3.37	0.57	Agreed
2.	It facilitates flipped classroom model providing initial explanations, leaving class time for deeper discussions and activities.	3.29	3.21	0.54	0.85	3.24	0.57	Agreed
3.	Students enjoy the interactive and conversional nature of X & Y, making learning more enjoyable.	2.84	2.82	0.74	0.76	2.83	0.57	Agreed

4.	Vocational educators find that X & Y help in keeping lessons dynamic and adapting to the ever-changing educational landscape.	3.27	3.22	0.70	0.70	3.24	0.57	Agreed
5.	It aids in creating a more inclusive learning environment by accommodating diverse student needs.	3.59	3.56	0.56	0.60	3.67	0.57	Agreed
6.	The adaptability of X & Y allows for seamless integration into both traditional and tech-savy classrooms.	3.49	3.45	0.74	0.75	1.77	0.57	Agreed
7.	X & Y can be a valuable tool for supporting students with different learning styles, catering to visual and auditory learners.	2.76	2.72	0.66	0.60	0.85	0.57	Agreed
8.	Students benefit from the instant availability of information, improving their research and study skills	3.33	3.29	0.82	0.86	1.42	0.57	Agreed
9.	X & Y assist in breaking down complex topics, making them more digestible and accessible to students.	3.23	3.13	0.63	0.68	1.77	0.57	Agreed
10.	It serves as an effective tool for formative assessment, gauging students understanding through their interactions.	3.16	3.09	0.74	0.80	0.70	0.57	Agreed
11.	The natural language processing abilities of X & Y contribute to a more authentic and engaging learning experience.	3.34	3.28	0.80	0.87	1.70	0.57	Agreed
12.	Teachers appreciate the flexibility of incorporating X & Y into lesson plans, adapting to the educational landscape.	2.93	2.88	0.62	0.62	1.85	0.57	Agreed
13.	X & Y encourage a growth mindset by promoting a positive attitude towards learning and problem-solving.	2.93	2.88	0.60	0.62	3.37	0.57	Agreed
14.	Students find X & Y to be non-intimidating platform, making it easier for them to seek assistance.	3.16	3.09	0.74	0.80	3.24	0.57	Agreed
15.	It is a helpful resource for reinforcing key concepts and providing additional example to aid understanding.	3.34	3.27	0.67	0.71	1.77	0.57	Agreed
16.	Using X & Y can enhance teacher-student relationships by fostering open communication and accessibility.	3.16	3.06	0.88	0.91	3.24	0.57	Agreed
17.	The versatility of X & Y makes it suitable for various subjects, offering support across the curriculum.	2.57	2.77	0.83	0.80	3.57	0.57	Agreed
18.	X & Y are great tools for promoting self-directed learning, allowing students to explore topics at their own pace.	2.53	3.18	0.61	0.63	3.37	0.57	Agreed

19.	Integrating X & Y into lessons spark curiosity and encourages students to ask more questions.	3.39	3.35	0.56	0.58	0.86	0.57	Agreed
20.	It is a time efficient way to provide additional support to students, especially during remote or blended learning	3.29	3.21	0.54	0.85	1.42	0.57	Agreed
21.	The conversational aspect of X & Y assist in developing effective communication skills among students.	2.84	2.82	0.74	0.76	1.77	0.57	Agreed
22.	X & Y aid in personalized learning by tailoring responses to individual student queries, catering to their unique needs.	3.27	3.22	0.70	0.70	1.37	0.57	Agreed

Source: **Fictitious data, for illustration purposes only**

Note:
X = ChatGPT
Y = Gamma.app
X1= mean for respondents (vocational educators or lecturers)
X1= mean for respondents (vocational education students)
SD= Standard deviation for respondents
t-Cal= t-calculated
RQ= Research Questions
NS= Not Significant
H0 = Hypothesis of significance

The results on Table 1 for item statements 1-22 had mean ratings ranging from 2.74 to 3.47 (for the opinions of both categories of respondents i.e. vocational educators and vocational students), indicating strongly agreed. The implication is that both lecturers and students strongly agreed that ChatGPT and Gamma.app should be highly utilized in the teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State. The cluster mean of 3.17 additionally reveal that the itemized skills were strongly agreed to by the respondents.

Also, the result of t-test analysis showing t-calculated values being lower than the t-tabulated values for all the 22 itemized statements; indicates that there was no significant difference in the mean responses of vocational educators and vocational education students' opinion on the utilization of ChatGPT and Gamma.app in teaching, learning and assessment of 21st century vocational education students in Colleges of Education.

Research question 2: *What are the benefits of utilizing ChatGPT and Gamma.app during Teaching, Learning and Assessment of vocational students at 21st century Colleges of Education in Enugu State?*

Table 2: Mean responses and standard deviation on the benefits of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State

S/N	ITEM	X1	X2	SD1	SD2	t-cal	t-tab	Decision	H_0
1.	It increases lecturers' innovative skills, students' Engagement with online schooling	3.92	3.32	0.76	0.58	0.37	0.91	Agreed	NS
2.	It increases a blended approach to teaching, learning, and assessment	3.25	3.16	0.50	0.80	0.24	0.91	Agreed	NS
3.	21st Students would be connected to other scientists, researchers, and vocational educators	2.82	2.80	0.72	0.74	0.81	0.91	Agreed	NS
4.	Lecturers and students would have access to global resources in addition to their training background	3.28	3.23	0.71	0.71	0.25	0.91	Agreed	NS
5.	There would be increased collaboration among lecturers and students which would improve learning	3.61	3.58	0.58	0.62	0.55	0.91	Agreed	NS
6.	Lecturers and students can share their individual or collective challenges	3.49	3.45	0.74	0.75	0.77	0.91	Agreed	NS
7.	21st century students can access education anytime and any day.	2.76	2.72	0.66	0.60	0.85	0.91	Agreed	NS
8.	It removes the limiting boundaries of classroom	3.33	3.29	0.82	0.86	0.42	0.91	Agreed	NS
9.	Use of X & Y allow the delivery of education	3.23	3.13	0.63	0.68	0.77	0.91	Agreed	NS
10.	It creates new opportunities for teaching, learning, and assessing students	3.16	3.09	0.74	0.80	0.70	0.91	Agreed	NS
11.	Utilizing X & Y can help 21st century students improve their performance in standardized assessment	3.34	3.28	0.80	0.87	0.70	0.91	Agreed	NS
12.	Utilizing X & Y helps 21st century students improve their performance in standardized assessment	2.93	2.88	0.62	0.62	0.85	0.91	Agreed	NS
13.	It can improve students' self-concept and motivation	2.93	2.88	0.60	0.62	0.37	0.91	Agreed	NS
14.	It makes academic relevant to today's ICT-Driven workforce	3.16	3.09	0.74	0.80	0.24	0.91	Agreed	NS
15.	It creates more dynamic interaction between students and their teachers	3.34	3.27	0.67	0.71	0.77	0.91	Agreed	NS
16.	It helps students control and monitor their own learning	3.16	3.06	0.88	0.91	0.24	0.91	Agreed	NS

Note:
X = ChatGPT
Y = Gamma.app
X1= mean for respondents (vocational educators or lecturers)
X1= mean for respondents (vocational education students)
SD= Standard deviation for respondents
t-Cal= t-calculated
RQ= Research Questions
NS= Not Significant
H0 = Hypothesis of significance

The results on Table 2 showed that the mean responses of all the sixteen (16) items exceeded the cut-off point level of 2.5 for both vocational educators and vocational education students. This means that majority of the respondents used in the study agreed on the listed items as being benefits of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of 21st century vocational education students in Colleges of Education. The standard deviation ranged from 0.50 to 0.88 for the vocational educators and 0.58 to 0.91 for vocational education student respondents. This indicated that both lecturers and students mean responses were not very far from each other.

The result of the t-test analysis indicated that the calculated t-tab values for all the itemized statements were below the t-tab value of 0.91. Based on this, the null hypothesis is confirmed for all the sixteen itemized statements and were implied to bear no significant difference among the mean responses of the lecturers and students' respondents on the benefits of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State.

Research question 3: *What are the challenges of utilizing ChatGPT and Gamma.app during Teaching, Learning and Assessment of vocational students at 21st century Colleges of Education in Enugu State?*

Table 3: Mean responses and standard deviation on the challenges of utilizing ChatGPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State

S/N	ITEM	X1	X2	SD1	SD2	t-cal	t-tab	Decision	H_0
1.	Lack of internet network infrastructure	3.92	3.52	0.76	0.58	0.87	0.91	Agreed	NS
2.	Lack of computer and other devices	3.25	3.16	0.50	0.80	1.24	0.91	Agreed	NS
3.	Lack of technical support	2.82	2.80	0.72	0.74	0.21	1.91	Agreed	NS
4.	Lack of Lecturers' training and support	3.30	3.23	0.71	0.71	1.52	1.91	Agreed	NS
5.	Problem of cheating during online assessment	3.31	3.58	0.58	0.62	1.55	1.91	Agreed	NS
6.	Limited time for completing course content and planned assessment	3.79	3.45	0.74	0.75	1.67	1.91	Agreed	NS
7.	Lack of lecturers' competence in utilizing ICT tools	3.76	2.72	0.66	0.60	1.65	1.91	Agreed	NS
8.	High level of digital illiteracy in the society	3.33	3.29	0.82	0.86	0.43	1.91	Agreed	NS
9.	Mass poverty among the citizens	3.53	3.13	0.63	0.68	1.76	1.91	Agreed	NS
10.	Absence or total lack of electricity	3.16	3.09	0.74	0.80	0.40	1.91	Agreed	NS
11.	Poor ICT technology	3.44	3.28	0.80	0.87	0.70	1.91	Agreed	NS
12.	Poor planning	3.90	2.88	0.62	0.62	1.75	1.91	Agreed	NS

Note:
X1= mean for respondents (vocational educators or lecturers)
X1= mean for respondents (vocational education students)
SD= Standard deviation for respondents
t-Cal= t-calculated
RQ= Research Questions
NS= Not Significant
H0 = Hypothesis of significance

The results on Table 3 showed that the mean responses of all the twelve (12) items exceeded the cut-off point level of 2.5 for both lecturers and students. This means that majority of the respondents used in the study agreed on the listed items as being challenges of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State. The standard deviation ranged from 0.50 to 0.82 for the lecturers and 0.58 to 0.86 for student respondents. This indicated that both lecturers and students mean responses were not very far from each other.

The result of the t-test analysis indicated that the calculated t-tab values for all the itemized statements were below the t-tab value of 1.91. Based on this, the null hypothesis is confirmed for all the twelve itemized statements and were replied to bear no significant difference among the mean responses of the lecturers and students' respondents on the challenges of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State.

The findings of the study revealed that the respondents agreed on ChatGPT and Gamma.app being

utilized during teaching, learning and assessment of 21st century vocational education students at Colleges of Education. Most of the student respondents (about 85%) strongly agreed with utilizing ChatGPT and Gamma.app in teaching, learning and assessment of 21st century vocational education students. These results are in conformity with the findings of (8), who suggested leveraging on social media platforms and artificial intelligence as new approaches to learning for generation-Z. Also, information provided by the vocational educators (i.e. lecturers as respondents) showed that most of the vocational educators (with mean score ≥ 2.5), agreed that AI tools should be utilized during teaching, learning and assessment of 21st century vocational education students. The result of the null hypothesis also supported the findings showing that there is no significant difference between the mean ratings of vocational educators and vocational students on their opinions about utilizing AI tools during teaching, learning and assessment of 21st century vocational education students.

The study highlighted sixteen benefits of utilizing ChatGPT and Gamma.app in teaching, learning and assessment of 21st century vocational education students. These included increasing innovativeness, students' engagement, ability to practice online schooling, connecting with other scientists, researchers and vocational educators, access to global vocational educators with possibility of collaboration; unrestricted/unlimited access to educational resources, improving students' performance in standardized tests/assessments, creating more dynamic interaction between students and lecturers, and students ability to control and monitor their own learning. These benefits agree with the findings of (14), who opined that ICT tools such as ChatGPT and Gamma.app create opportunities for teaching, learning and assessment of vocational education. It also agrees with the views of (10) who posited that, with utilization of ICT tools in teaching and learning, teachers' collaboration will improve and improve on delivering desired learning outcomes. (13) also observed that Google classroom for instance, is proven to promote interaction between lecturers and students. These findings are also in agreement with (6), who observed that Mobile device apps such as ChatGPT and Gamma.app provide teachers and students enhanced flexibility and offer new interaction opportunities.

The study also highlighted 12 challenges militating against utilization of AI tools during teaching, learning and assessment of 21st century vocational education students in Colleges of Education. The analysis of research question three revealed that the challenges of utilizing AI tools during teaching, learning and assessment of 21st century vocational education students include; lack of internet network infrastructure, lack of computers and devices, lack of technical support, lack of lecturers' trainings and support, problem of cheating during online assessment, limited time to complete course content, high level of digital illiteracy in the society, mass poverty among citizens, absence or total lack of electricity, poor ICT technology and poor planning. The result aligns with the views of (4), who established that poor internet connectivity has been the major factor hindering social works in Africa. Also, (1) affirmed that poor electricity supply has been a major challenge in utilizing ICT tools in teaching and learning especially for the Nigerian rural population.

The lower error ranges among the some questionnaire items which are below the threshold score of 2.5 implies that the estimates of the mean responses on respondents' opinions, perceived benefits of utilizing Chat-GPT and Gamma.app and the perceived challenges of utilizing Chat-GPT and Gamma.app indicates their stronger agreement as being tools that could be utilized during teaching, learning and assessment for vocational students at 21st century Colleges of Education in

Enugu State. On the other hand, higher error ranges above 2.5 threshold score observed among some questionnaire items indicates uncertainty or the respondents not being able to make informed decisions related to utilizing Chat-GPT and Gamma.app during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State.

Conclusion

Utilizing AI tools such as ChatGPT and Gamma.app during teaching, learning and assessment is imperative in addressing the challenges of educating the 21st century vocational education students in Colleges of Education. Ideally, vocational education entails scholars being skillfully developed for industrial, economic and social progress for national development. It offers the requisite skills, technical and professional manpower needed for national development. Being that most classroom instruction and teaching by vocational educators involve demonstrative skills and the global challenge of schooling is being faced with unprecedented crisis arising from the Post-COVID-19 realities, economic crisis and school disruptions due to insecurities; schools should leverage on utilizing AI tools during teaching, learning and assessment of vocational students at 21st century Colleges of Education in Enugu State as this will ensure a functional and environment-friendly vocational education in the Colleges of Education.

It is also concluded that based on the scenarios of possible higher error ranges, some of the respondents (i.e. both vocational educators and vocational education students are less certain about the use of Chat-GPT and Gamma.app, the benefits of Chat-GPT use and the challenges in utilizing Chat-GPT and Gamma.app during teaching, learning and assessment of vocational students at 21st-century Colleges of Education in Enugu State.

Recommendations

Based on the findings of this study, the following recommendations are made

1. Government should seek partnership with international development agencies like UNESCO, to provide technical support and assistance needed to fully integrate AI tools such as ChatGPT and Gamma.app into teaching, learning and assessment of 21st century vocational education students.
2. Based on observed higher error ranges among some of the questionnaire items, it recommended that awareness/orientation/ enlightenment on classroom-oriented use of Chat-GPT and Gamma.app should be intensified among all the stakeholders in the 21st century Colleges of Education in Enugu State and beyond.
3. Vocational educators should adopt blended learning sessions that fully utilize AI tools.
4. The epileptic power supply in most campuses of Colleges of Education should be addressed to ensure full utilization of ICT tools during teaching, learning and assessment of 21st century vocational education students.

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