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Availability and perceived influence of e-learning on achievement of undergraduate computer science students in universities in Delta State

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Abstract

This study was titled availability and perceived influence of e-learning on achievement of undergraduate computer science students in universities in Delta State. Five research questions and four hypotheses tested at 0.05 level of significance guided the study. Descriptive survey design was used. The population was 5,896 with sample size of 300. Simple random grouping was used to select from the 300 level students a total of 300 students that participated as respondents to the study. The random grouping method yielded 111, 93 and 96 computer science students from the sampled universities respectively. A researcher constructed test and questionnaire was developed and validated at a reliability coefficient of 0.86 and 0.82 respectively served as instruments. Data gathered from the field was analyzed using statistical tools such as: Mean, standard deviation for research questions. Items with mean weight of 2.50 and above were accepted while items with mean weight of 2.49 and below were rejected. Hypotheses were tested by the use of independent t-test at 0.05 level of significance. Statistical package for social sciences (SPSS) version 27 was used for the analysis. Meanwhile, percentage, mean and standard deviation was used to answer research questions while T-test was used to test the hypotheses. The result of the study among others revealed that e-learning technologies have positive influence on computer education students' achievement.

Keywords:

Availability, Perceived, Influence, E-Learning, Achievement, Computer Science.

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INTRODUCTION

Background to the Study

Education is the process of acquiring broad knowledge, improving thinking and judgment abilities, and generally preparing oneself intellectually for adulthood. It is the acquisition of necessary skills and the development of mental, physical, and social capacities as instruments for individuals to live in and contribute to society's development (FRN, 2013). One of the prime purposes of education is to impact in individual's skills and competencies that will result in useful living. Hence, education in Nigeria, especially at the secondary school level, is structured to prepare school leavers with the necessary theoretical and practical proficiency as well as skills in order to make useful living for themselves and the society they live in (FRN, 2013).

Also, through theoretical and practical proficiency, contemporary education aims at classical discoveries which will result in the output of individuals, capable of solving reoccurring human problems (Okoye, 2019). In addition, through expanded knowledge creation, sustained skill acquisition and inventions, contemporary education among others seeks to promote the output of problem solving individuals who can transform classroom instructions into real life situations (Ahmed, 2020). These proposals of contemporary education are in consonance with the objectives, mission and vision of modern science on the output of individuals whose classroom experiences can be transformed into problem solving.

Science is the systematic study of the natural environment. It is the basic and fundamental study of nature. It is the scientific study of the natural environment in relation to reoccurring phenomena which affects life. It is the quantitative and objective knowledge of the natural environment, whose core principle is embedded in fostering first hand understanding of nature which will in turn be manipulated to favor life (Opara in Ejezube, 2021).

Computer is acknowledged as one of the major wonders of human existence. Computer is an electronic machine. It is a machine that takes a rule or a recipe (what is usually called an "algorithm") and applies it to whatever it is instructed to apply it to (Anderson, 2018). Akudolu (2019) defined computer as, an electronic device that manipulates information or data.

Knowledge of computer is of paramount importance to national development. It therefore follows that to foster first hand understanding of computer operations and manipulations and at same time help individuals adapt to the competitive computer age, computer studies was introduced at all levels of Nigerian education system.

However, despite the importance of computer and its allied contents, students' inability to demonstrate conceptual understanding of computer concepts both at the secondary and tertiary levels of education have continued to generate fear and concerns over instructional methods and efficiency. Referring to a three years report of West African

Examination Chief Examiner, between 2020, 2021 and 2022 revealed a myriad of achievement deficiency among computer students. The report revealed that out of 2360, 3078 and 3244 computer students that registered and sat for the Senior School Certificate Examinations (SSCE) only a total of 940, 926 and 1122 representing 39.8%, 43.1% and 43.8% respectively passed computer at credit grade and above while a total of 1420, 1752, and 1822 representing 60.2%, 60.0% and 56.2% respectively failed the subject (West African Examination Council Chief Examiners Report On School Candidate Examination In Delta State, 2022). The report furthered that, the percentage of female students who passed at credit level and above was 60% while percentage of male students was 40%. With a distinction at West African Examination pegged at 70%, it becomes disturbing that only a percentage below 39.8%, 43.1% and 43.8% made a WAEC distinction between 2020, 2021 and 2022. Among others, the Chief Examiner observed that candidates' inability to tackle questions in some computer concepts such as computer networking have continued to cost computer students wholesome scores. In addition, the Chief Examiner observed that candidates show poor conceptual understanding and mastery of computer contents. At the tertiary level, reports of result moderation panel indicated that achievement among computer science students needs to be improved. The panel report among others revealed that students' under achievement in computer science may not be unconnected with a number of concepts such as auto cards, cyber, networking among others which are generally perceived by the students as difficult. The panels further revealed that inability of students to achieve meaningfully on questions arising from these concepts have affected their overall performances. Hence, the achievement gap.

Achievement gap in computer over time remains a source of concerns to computer educators. Researchers such as: Bolla (2022), Adam (2022), among others who investigated the causal factors of students' achievement gap in computer. Their findings revealed persistence use of the teacher centered method of instruction such as lecture method by computer teachers as prominent among the causal factors of achievement gap in computer. Lecture Method of Instruction (LMI) as well as other teacher centered methods represents the bulk of pedagogical principles, where learners are mere receptors of knowledge (Obi, 2021). It is duly characterized by a one way channel of communicating information which recognizes the teacher as the main figure and cardinal participant, the information supplier and knowledge originator. Inherent in LMI is passive knowledge reception by the learner, lack of participation of learners as well as poor conceptual understanding. Some of these LCMI has been investigated to ascertain their efficiency in sciences on varying capacities. For instance: Okoye (2020) investigated the effect of conceptual change pedagogy on achievement of computer science students, Ahmed and Munawary (2021) experimented on the effect of concept mapping on achievement and retention among biology students while Ahmed in Muhamad (2021) investigated the effect of practical approach on achievement and acquisition of science process skills among computer students. Their findings revealed that to promote interest and achievement among students, it is necessary to deemphasize lecture methods of instruction and navigate to the students centered methods.

E-learning as a concept has become a platform for meeting the needs of many learners all over the globe. The demand for this platform came as a result of the desire to make education available to diverse learners and through diverse sources. The origin of e learning can be traced as far back as the 19th century with the use of correspondence by Isaac Pitman to teach his pupils shorthand. This is followed by the invention of the testing machine in 1924 by Professor Sidney Pressey. Also, in 1954, a Harvard Professor Skinner invented the "teaching machine" which enabled schools to administer programmed instruction to their students. However, the advent of computer in the 20th century digitalized the world and by extension computerized learning. Hence, E-learning.

E-Learning, a dynamic educational paradigm, encompasses the utilization of electronic technologies and digital resources to disseminate knowledge, thereby reshaping the traditional educational landscape (Haleem, Javaid, Qadri & Suman, 2022). It holds the promise of surmounting geographical constraints, rendering learning accessible, flexible, and captivating. In Nigeria, the embracement of e-learning is in its embryonic phase but exhibits a persistent ascent. Numerous catalysts have propelled this transformation. Foremost, the proliferation of affordable digital devices and increased internet accessibility have democratized education, narrowing the chasm that once separated learners from quality educational resources (Bubou & Job, 2021). These advancements have, in turn, unleashed a plethora of opportunities for students across the nation, transcending the limitations of physical classroom walls. Furthermore, according to Bubou and Job (2021), the global educational environment is evolving at an unprecedented pace, necessitating the adaptation to new learning modalities. E-learning equips students with the skills and knowledge required to thrive in a rapidly changing world. As the country continues to integrate digital tools and innovative platforms, the prospects for e-learning in Nigeria are poised for significant growth, enabling a brighter, more inclusive, and globally competitive future for its educational landscape. The rationale behind this research stems from the urgent need to improve the state of education in Nigeria. Education is a fundamental right, and its accessibility and quality should not be compromised. However, Nigeria faces numerous challenges in providing quality education, from a lack of infrastructure to a shortage of qualified teachers. E-learning initiatives have the potential to address many of these issues, but their effectiveness is questionable. As a result, understanding the problems and prospects of e-learning in Nigeria is a key step in formulating effective policies for educational reform. The motivation for this research is rooted in the desire to contribute to the betterment of Nigerian society. By improving education, not only can individual lives be transformed, but the nation as a whole can progress economically, socially, and culturally. This research aims to serve as a catalyst for change, by providing actionable recommendations and insights that can guide educational stakeholders and policymakers in transforming the educational landscape in Nigeria.

Achievement in science is a term of consistence importance which has been in use for decades to designate the total performance outcome of learning. It is a measure which indicates the extent to which a student has successfully accomplished specific goals that were the focus of instruction (Marcel, 2017). It can as well be seen as a set of standard scores,

grades and overall academic ability and performance outcome of a learner. It is a formal display of knowledge attained and skills acquired in schools, commonly measured by examination, test and continuous assessment scores.

Achievement is a vital factor in education, in the sense that it provides a measure for instructional efficiency as well as attainment of objectives. Enhancing achievement in computer remains a major concern to computer educators. Students' ability to achieve meaningfully in examinations often reflects their conceptual understanding in the subject and by extension their ability to transfer classroom knowledge into real life situations. In computer, achievement stereotype has remained a source of concern to researchers, as questions on instructional strategies that can help maximize achievement of students irrespective of gender have persisted. As such improving achievement in computer irrespective of gender becomes a major aspect of current research.

Gender is considered as a moderator variable. Gender is a socially constructed component of human sexuality, an inner feeling that one is either a male or a female (Mark, 2019). However, revolutions caused by renaissance in education have given rise to gender balance in both arts and sciences, thus filling some previously existing gender gap. Although some empirical findings such as Okafor (2020) revealed that gender issues in sciences acts in favor of males, others such as Obi (2021) observed that gender issues act in favor of the females. In contract, Okoye (2022) argued that gender has no significant effect on the achievement of male and female students. While some researchers submitted that gender has no significant influence on achievement others opined the contrary. Hence, introducing gender stereotype.

It is worthy to note that in as much as male and female differ in physiological appearance, there has not been any established fact that they differ in mental abilities. As such gender issues have continued to draw research attention and effect of gender on achievement appears controversial. Hence, inclusion of gender in the current study that is set to determine the perceived impact of e-learning on achievement of computer science students in Universities in Delta State.

Statement of the Problem

Over the years, persistent uses of lecture method of instruction by computer teachers have been a major cause of crack on achievement in computer. Thereby, leaving a dart of gap in achievement in computer. The lecture method of instruction, research has proved to be overtly deficient in enhancing desired conceptual understanding necessary to optimize achievement in computer. Hence, available research suggested navigation to some novel methods believed to be learner centered and can help ameliorate the challenges of achievement gap among computer students. It is on this note that the current research seek to understand what outcome in achievement computer students may obtain when instruction is structured to engage learners. Hence, the current research on the perceived impact of e-learning on achievement of computer science students of Universities in Delta State.

Purpose of the Study

The main purpose of this study is to investigate the availability and perceived influence of e-learning on achievement of computer science students of Universities in Delta State. Specifically, the study seeks to:

1. Determine the extent to which e-learning technologies are available for use in computer science education program in Universities in Delta State.
2. Determine the influence of e-learning on academic achievements of undergraduate students of computer science education in universities in Delta State.
3. Determine e-learning on academic achievements of male and female undergraduate students of computer science education in universities in Delta State.
4. Identify the major constraints to the influence of e-learning technologies for pedagogical application in computer science education program in Universities in Delta State.
5. Determine strategies on improving the availability of e-learning technologies for teaching and learning of computer in Universities in Delta State.

Research Questions

The following research questions were raised to guide the study;

1. To what extent are e-learning technologies available in computer science education program in Universities in Delta State?
2. What is the influence of e-learning on achievement of undergraduate students of computer science education in universities in Delta State?
3. What is e-learning on academic achievements of male and female undergraduate students of computer science education in universities in Delta State.
4. What are the major constraints against the influence of e-learning technologies for pedagogical application in computer education program in Universities in Delta State?
5. What are the ways for improving the availability of e-learning for computer science education program in Universities in Delta state?

Hypotheses

The study will be guided by the following hypotheses which will be tested at .05 level of significance.

Ho_1 There is no significant difference in the mean rating of male and female in computer science education program on the extent of availability of e-learning technologies in Delta State Universities.

Ho_2 There is no significant influence of e-learning on achievement of male and female students of computer science education in universities in Delta State?

Ho_3 There is no significant difference in the mean rating of male and female in computer science education program on the constraints to the influence of e-learning technologies in Universities in Delta State.

Ho_4 There is no significant difference in the mean rating of male and female on the strategies for improving the availability of e-learning technologies for computer science education program in Universities in Delta State.

Methods

The research work adopted a descriptive survey research design. Ngwogu (2015) explained a survey research design as one in which a group of people or items is studied by collecting and analyzing data from few people or items considered to be representative of the entire group. The design is adequate as it helps in obtaining the views of respondents. The study was conducted in Delta state, Nigeria. Delta state is one of the 36 states that made up the Federal Republic of Nigeria and is situated at the Southern-South part of the country. It is bounded at the North, East, South and West by Edo, Anambra, Bayelsa States and Atlantic Ocean respectively. The population for the study covered the 5,896 Computer Science students in Public Universities. This was the actual number of Computer Science students for the 2022/2023 academic session in the various public universities of Delta State. The universities include: Delta State University, Abraka, Delta University of Science and Technology, Ozoro; University of Delta, Agbor and Dennis Osadebay University Asaba. A total of 300 computer science students from the four state public Universities in Delta State serves as respondents to the current study. Stratified random sampling method was used to sample two out of the four state public universities in Delta State. The two universities sampled are Delta State University, Abraka, Delta University of Science and Technology, Ozoro. Although the two universities are within Delta state, essence of the stratification is to ensure that issues on closeness of institution which may influence the study is avoided.From the sampled universities, Delta State University Abraka has a total of 1,300 computer science students and Delta University of Science and Technology, Ozoro has a total of 1,100. Simple random grouping was used to select from the 300 level students a total of 300 students that participated as respondents to the study. The random grouping method yielded 111, 93 and 96 computer science students from the sampled universities respectively. Structured questionnaire and a computer achievement test were used for data collection in this study. The questionnaire was generated from the literature reviewed. Data gathered from the field was analyzed using statistical tools such as: Mean, standard deviation for research questions. Items with mean weight of 2.50 and above were accepted while items with mean weight of 2.49 and below were rejected. Hypotheses were tested by the use of independent t-test at 0.05 level of significance. Statistical package for social sciences (SPSS) version 27 was used for the analysis.

RESULTS

Research Question 1

To what extent are e-learning technologies available in computer science education program in Universities in Delta State?

Table 1: Mean and standard deviation (SD) response of extent of E-learning technologies are available in computer science program in Universities in Delta State.

CLUSTER A: E-Learning Technologies Availability in University in Delta state?

	ITEMS	No.	Mean	SD	REMARKS
1.	Computer laboratories	294	3.53	0.93	VHE
2.	Internet facilities	294	3.10	0.69	HE
3.	E-mail services	294	2.81	0.86	HE
4.	Desktop/laptop	294	3.31	0.70	HE
5.	Electric supply	294	3.42	0.59	HE
6.	Wi-Fi	294	2.90	0.84	HE
7.	E-learning Applications	294	3.11	0.65	HE
8.	Audio/videotapes/video conference	294	3.30	0.78	HE
9.	Software packages	294	3.12	0.90	HE
10.	E-mail services	294	3.20	0.74	HE
	Mean of Mean		**3.18**		**HE**

Table 1 displayed the extent to which E-learning technologies are available for computer science programme in universities in Delta State. The table depicted that item 1 with mean of 3.53 showed to a very high extent where as items 2-10 with mean of 3.0, 2.81, 3.31, 3.42, 2.90, 3.11, 3.30, 312 and 3.20 respectively showed extent of E-learning to a high extent. Invariably, the mean of Mean of the extent of availability of E-learning technologies for computer science programme was 3.18 indicating to a high extent.

This implies that e-learning technologies were available for computer science programme in universities in Delta State to a high extent.

Research Question 2

What is the influence of e-learning on academic achievement of undergraduates of computer science program in universities in Delta State?

Table 2: Mean and standard deviation (SD) of influence of e-learning on academic achievement of undergraduates of computer science

	ITEMS	No.	Mean	SD	REMARKS
1.	Computer laboratories	294	3.44	0.65	HE
2.	Internet facilities	294	3.09	0.69	HE
3.	E-mail services	294	2.80	0.86	HE
4.	Electric overhead projector	294	3.63	0.60	VHE
5.	Electric supply	294	2.81	0.86	HE
6.	Wi-Fi	294	3.21	0.75	HE
7.	E-learning Applications	294	3.01	0.93	HE
8.	Audio/video tapes/ video conference	294	3.20	0.74	HE
9.	Software packages	294	2.91	0.84	HE
10.	e-mail services	294	3.23	0.76	HE
	Mean of Mean		**3.13**		**HE**

Table 2 revealed the extent to which e-learning influenced the achievement of undergraduates computer science programme in Delta State universities. The Table revealed that item 4 with mean of 3.63 influenced their achievements to a very high extent where as items 1,2,3, 5,6,7,8,9and 10 with mean of 3.44,3.09,2.80,2.81,3.21,3.01,3.20, 2.91 and 3.23

respectively influenced their achievements to a high expectation. At the same time, the mean of Mean of the extent to which e-learning influence achievements of undergrad of computer science was 3.13 which indicated to a high extent. Hence , this implies that e-learning influenced achievements of undergraduates of computer science in Delta State universities to a high extent.

Research Question 3

What is the influence of e-learning on achievement of male and female undergraduate students of computer science programme in universities in Delta State?

Table 3:
Mean and standard deviation (SD) of male and female undergraduates of computer science on influence of e-learning in their achievements.

		Male = 98			Female = 196		
	ITEMS	**Mean**	**SD**	**Remark**	**Mean**	**SD**	**REMARKS**
1.	E-learning helps me to consult relevant materials from other libraries	2.911	0.60	HE	2.32	0.72	HE
2.	E-learning increases accessibility of education	3.09	0.70	HE	3.10	0.64	HE
3.	E-learning makes studying easier	2.68	0.87	HE	2.81	0.85	HE
4.	E-learning enables me join social media groups	2.81	0.74	HE	3.20	0.69	VHE
5.	E-learning provides learners with additional resources to assist resource-based learning	2.78	0.87	HE	2.82	0.85	HE
6.	E-learning accelerates reading and learning at one's pace	3.19	0.75	HE	3.22	0.75	HE
7.	E-learning improves relevant technology skill of students	2.98	0.50	HE	3.36	0.98	HE
8.	Online experiences helps me engage actively in my learning	2.79	0.76	HE	3.21	0.77	HE
9.	Assignments were marked promptly	2.88	0.95	HE	2.93	0.93	HE
10.	E-learning motivates me to do my own work without others help	2.53	0.65	HE	2.29	0.74	HE
	Mean of Mean	**2.86**		**HE**	**2.92**		**HE**

Table 3 displayed the influence of e-learning on academic achievement of male and female undergraduates of computer science in Delta State universities. The table displayed that items 1 to 10 for male were influenced to a high extent. Whereas for female undergraduates, items 2 to 9 influenced to a high extent and items 1 and 10 with mean of 2.32 and 2.29 respectively influenced to a low extent. Furthermore, the mean of Mean of male undergraduates was 2.86 and that of female undergraduates was 2.92 showed that both inflamed their achievement to a high extent. At this juncture, the study implied that e-learning influenced on male and female undergraduates achievement to a high extent.

Research Question 4:

What are the major constraints against the influence of e-learning technologies for pedagogical application in computer science programme in Delta State universities.

Table 4:
Mean and standard deviation(SD) major constraints against the influence of e-learning technologies for pedagogical application in computer science programme in Delta State universities.

S/N	ITEMS	N	Mean	SD	REMARKS
1	Poor power supply affects the electronic devices for teaching and learning of computer	294	3.49	0.56	Agree
2	Lecturers may loss class control if e-learning is encouraged in learning computer.	294	2.98	0.79	Agree
3.	Lecturers prefer the "talk and chalk" method of teaching and learning computer.	294	2.70	0.93	Agree
4.	Lack of manpower to maintain electronic devices used for computer.	294	2.69	0.69	Agree
5.	High cost of maintaining electronic gadgets discourages their use for computer instruction.	294	3.12	0.60	Agree
6.	Disruption and network failure	294	3.31	0.70	Agree
7.	Lack of strong government policies of e-learning instructional delivery	294	2.92	0.94	Agree
8.	Narrow band with limited area covered by internet connectivity	294	3.01	0.63	Agree
9.	Lack of qualified staff with capacity in e-learning application	294	2.91	0.81	Agree
10.	Inadequate time for lecture delivery	294	3.22	0.75	Agree
	Mean of Mean		**3.30**		

Findings from Table 4 showed major constraints against the influence of e-learning technologies for pedagogical application in computer science programme in Delta State universities in Delta State. The result revealed that the respondents agreed that items 1 to 10 were major constraint against the influence of e-learning technologies for pedagogical applications. In the same vein, the mean of mean for major constraints was 3.03 indicating the respondents' agreement to the above items.

Therefore, the study implied the respondents agreed that there were major constraints against the influence of e-learning technologies for pedagogical applications in computer science programme.

Research Question 5:

What are the strategies for improving the availability of e-learning for computer science programme in Universities in Delta state?

Table 5: Mean and standard deviation (SD) response of strategies for improving the availability of e-learning for computer science programme in Universities in Delta state

S/N	ITEMS	N	Mean	SD	REMARKS
1	Making use of e-books with solutions for computers in the Institutions.	294	3.59	0.65	Agreed
2	There should be an awareness campaign on the benefits of e-learning within and outside institution.	294	3.21	0.75	Agreed
3	Using public address systems for audibility during time of lectures	294	2.91	0.93	Agreed
4	Security should be provided within the institutions environment to avoid theft.	294	3.30	0.70	Agreed
5	Using projectors for visual transmissions during the time of lectures.	294	3.70	0.89	Agreed
6	Lecturer and students making use of computer laboratory with internet facilities when the need arises	294	2.79	0.62	Agreed
7	Making the students to access all their course materials online.	294	2.84	0.96	Agreed
8	Creating online lectures through video conference.	294	3.31	0.78	Agreed
9	Lecturer giving the students online based assignments within the school periods/hours.	294	2.80	0.85	Agreed
10	Lecturer should ensure the use of interactive boards during classes	294	3.04	0.66	Agreed
	Mean of mean		**3.15**		**Agreed**

Result from Table 5 revealed strategies on improving the availability of e-learning for computer science programme in Universities in Delta State. The result revealed that the respondents responded that items 1 to 10 strategies for improving the availability of e-learning for computer science programme. Meanwhile, the mean of mean also revealed that the respondents responded that these strategies were for improving the availability of e-learning. Hence, the study indicated that the respondents agreed to the strategies for improving the availability of e-learning for computer science programme..

Test of Hypotheses

In other to make decisions on the availability and perceived influence of e-learning on academic achievement of undergraduates of computer science student in delta state, the following null hypotheses were tested at 0.05 level of significance.

Ho_1 There is no significant difference in the mean rating of male and female undergraduates in computer science programme on the extent of availability of e-learning technologies in Delta State Universities.

Table 6: Independent t- test of male and female computer science undergraduates on the extent of availability of e-learning technologies in Delta State Universities

Variable	N	Mean	SD	T-cal	df	P-value	Remarks
Male	98	30.91	7.69	0.338	292	0.736	Not Significant
Female	196	31.23	7.50				Significant

Analysis from table 6 indicated the independent t – test of male and female computer science undergraduates on the extent of availability of e-learning technologies in Delta State universities. The result revealed t – calculated of .338 with 292 degrees of freedom and associated p-value of .736. The associated value of .736 was greater than 0.05 level of significance; hence the null hypothesis was not rejected. Therefore, there is no significant difference in the mean rating of male and female computer science undergraduates on the extent of availability of e-learning technologies in Delta State Universities.

Ho_2 There is no significant influence of e-learning on achievement of male and female undergraduates of computer science in universities in Delta State?

Table 7: Independent t- test of male and female computer science undergraduates on the influence of e-learning on their academic achievement in universities in Delta State

Variable	N	Mean	SD	T-cal	df	P-value	Remarks
Male	98	30.30	7.35	0.531	292	0.041	Significant
Female	196	30.60	7.16				Significant

Table 7, depicted the independent t – test of male and female computer science undergraduates on the influence of e-learning technologies on academic achievement. The findings depicted t – calculated of .531 with 292 degrees of freedom and associated p-value of .041. The associated value of .041 was less than 0.05 level of significance, thus the null hypothesis was rejected. Invariably, there is a significant influence of e-learning technologies on academic achievement of male and female computer science undergraduates in Delta State Universities.

Ho_3 There is no significant difference in the mean rating of male and female undergraduates of computer science in universities in Delta State on the constraints to e-learning technologies in Universities in Delta State.

Table 8: Independent t - test of male and female undergraduates on constraints of the influence of e-learning technologies in Universities in Delta State

Variable	N	Mean	SD	T-cal	df	P-value	Remarks
Male	98	30.30	7.32	0.383	292	0.702	Not Significant
Female	196	30.65	7.16				Significant

The result in Table 8, revealed the independent t – test of male and female computer science undergraduates on the constraints of the influence of e-learning technologies in Universities in Delta State. The table revealed t – calculated of .383 with 292 degrees of freedom and associated p-value of .702. The associated value of .702 was greater than 0.05 level of significance; hence the null hypothesis was not rejected. Nevertheless, there is no significant difference in mean rating of male and female undergraduates in computer science programme on the constraints to e-learning technologies in Universities in Delta State.

Ho_4 There is no significant difference in the mean rating of male and female undergraduates of computer science programme on strategies for improving the availability of e-learning technologies for computer science programme in Universities in Delta State.

Table 9: Independent t - test of male and female undergraduates on the strategies for improving the availability of e-learning technologies for computer science programme in Universities in Delta State.

Variable	N	Mean	SD	T-cal	df	P-value	Remarks
Male	98	29.89	7.20	0.443	292	0.819	Not Significant
Female	196	30.19	7.04				Significant

Table 9, showed the independent t – test of male and female computer science undergraduates on the strategies for improving the availability of e-learning technologies for computer science programme in Universities in Delta State. The result indicated t – calculated of .443 with 292 degrees of freedom and associated p-value of .819. The associated value of .819 was greater than 0.05 level of significance, therefore the null hypothesis was not rejected. However , there is no significant difference in mean rating of male and female undergraduates in computer science programme on the strategies for improving the availability of e-learning technologies for computer science programme in Universities in Delta State.

DISCUSSION OF RESULTS

Extent of e-learning technologies availability for use in computer science program in Universities in Delta State.

The opinion of the current research aligns with the work of Eze and Bello (2018) which revealed that e-learning facilities are adequate and accessible to users although with poor evidence of its utilization. Also, is the earlier submission of Okonkwo and Oduh (2017)

which asserted that widespread availability of e-learning technologies has precipitated a vast change in education especially in the delivery of instruction. However, it contradicted the opinion of OECD (2015) who revealed that e-learning technologies are not readily available for use.

The results of the study revealed meaningfully positive availability of e-learning technologies for use in Universities in Delta State. However, the acceptance of no significant difference on the mean rating on the extent of availability may be have been informed by non utilization of the available technologies.

Influence of e-learning on academic achievements of undergraduate computer science in universities in Delta State.

The findings of this study in consonance with that of Zolochevskaya et al (2021) which found that e-learning technologies enhanced students' achievement in computer. This also supports the earlier findings by Ogbonna (2016) which showed that students exposed to synchronized e-learning technologies show meaningful appreciation in achievement. In addition, the opinions Salamat, Ahmed and Saifi (2018), Abel (2020) as well as Onyema et al (2020) in the areas of interest, students' participation and achievement, e-learning was found to be more positive and aligning with the current research. Hence, upholding the findings of the current study.

Influence of e-learning on achievements of male and female undergraduate students of computer science in universities in Delta State.

Finding of the study revealed that e-learning technologies are more effective in enhancing female students' achievement in computer than males. It therefore reaffirms the findings of Obi (2021) which revealed that female students performed better in sciences compared to male students. Agreeing with Egolum (2021), the study found that the female students performed better in achievement more than the male students when taught e-learning technologies. This finding suggests that there is a connection between gender and achievement in computer.

However, the findings of the study contradict the work of Okafor (2020) who revealed that gender acts in favor of the males in sciences. Further, arguments of Okoye (2021) that science generally bears a masculine conception, thereby endangering the female gender was equally contradicted by the current study. The findings of this study also questioned the proposals of Okoye (2021) which found that gender did not significantly influence the achievement of science students.

Constraints to influence of e-learning technologies for pedagogical application in computer science programme in Universities in Delta State.

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The current research is in consonance with the submission of Mackeogh and Fox (2009) which revealed that availability and utilization of e-learning facilities is endangered by a number of factors such as resources, proper equipment, technical support, funding, staff

among others which correlates with the challenge proposals of the current study. It also aligns with the submission of Salawudeen (2010) who upheld inequality in access to facilities, technophobia, cost among others as some of the challenges to e-learning. Although these challenges as proposed by Mackeogh and Fox (2009) and Salawudeen (2010) may differ in some areas, they however reflected the problems and constrains so presented by the current research. Hence, validating the perceived problems and constrains to the implementation of e-learning as proposed by the current research.

Strategies for improving the availability of e-learning technologies for teaching and learning of computer science in Universities in Delta State.

The current research is in consonance with the submission of Egolum (2023) which revealed appropriate funding, man power, adequate power supply, the use of e-books, online assessment, use of online course materials, online lectures among others as some of the strategies that may enhance the availability of e-learning technologies for computer science education program in Universities in Delta State . The submission of Egolum (2023) reflected the some of the strategies that may enhance the availability of e-learning technologies for computer science education program in Universities in Delta State as proposed by the current research. Hence, validating the perceived strategies for the availability of e-learning technologies for computer science education program in Universities in Delta State as proposed by the current research.

Conclusion

The study underscores the substantial progress made by delta state public universities in establishing e-learning facilities. However, it also highlight the pressing need for improved maintenance, enhanced faculty engagement, and solutions to infrastructural challenges such as unreliable electricity supply. Addressing these issues is crucial for optimizing the use of e-learning technologies and ensuing they contribute effectively to the educational experiences of students. By adopting a holistic approach that includes ongoing training, adequate funding and robust infrastructure.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The management of public universities should establish a dedicated team thao t will be responsible for public for the continuous monitoring and maintenance of e-learning facilities to ensure they remain functional and up-to-date
2. Allocation of additional funds especially for the enhancement and expansion of e-learning technology and resources to address financial constraints and budgetary limitation.
3. There should be an implementation of regular professional development programs for faculty members to enhance their skills in using e-learning tools and integrating them into their teaching practice effectively.

4. Government should invest in reliable electricity supply and alternative power solutions to ensure uninterrupted access to e-learning facility.
5. Curriculum planners must be intimated on the need to integrate e-learning into the curriculum. Providing adequate time for the implementation.
6. Lecturers and undergraduate must be encouraged by the Government and the University authorities on the use of e-learning as alternative to conventional classroom instructions.

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