

Extent of Utilization of Cloud Computing Resources by Computer Education Students in Universities in Enugu State, Nigeria

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Key words: Cloud computing, cloud computing network resources, cloud computing servers, cloud computing storage resources, cloud computing application resources and utilization

Abstract: The study was carried out to determine the assessment on cloud computing need of computer education students in universities in Enugu state. In carrying out the research, three research questions and three null hypothesis were formulated for the study. The population for the study was 1020 persons. This consists of students at computer education in department in the university of Nigeria Nsukka (UNN) and students of computer education in Enugu state of Science and Technology (ESUT). The entire population was studied. Questionnaire was the instrument used for data collection. This consists of 46 items developed from the reviewed literature and used to elicit responses from staffs and students at regarding the research questions. Copies of the questionnaire were distributed personally by the researcher. The 100% of the questionnaire was returned. Data collected were analyzed using mean while t-test for independent sample was used to test the two null hypothesis at 0.05 level of significant. After carrying out necessary analysis, it was revealed that cloud computing is utilized but not to a very large extent in storing of student data also it was revealed that certain constraints hinder the utilization of online application of student registrations in Universities in Enugu state. It was recommended that a network-based management for cloud computing should be provided in universities in Enugu state to enable the improvement of academic performance of students in computer education in Universities in Enugu state.

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INTRODUCTION

The use of emerging technology in universities to support teaching and learning has clearly changed the way education is being conducted in many Nations.

Educational institutions are able to collaborate, network, share resources and increase enrolment because of technology. It is common to see many online certificate and degree programmes being offered in many universities around the world. Educational institutions

throughout the world have become highly dependent on technology for teaching, learning and for conducting research. They continue to seek opportunities to rationalize the way they manage their resources. These opportunities have become even better with the introduction of cloud computing. Cloud computing is becoming an attractive technology because of its dynamic scalability and effective usage of the resources^[1]. The further explained than, it can also be utilized under circumstances where the availability of resources is limited. Cloud computing has been an important term in the world of Information Technology (IT) where computer education student is required to belong. Cloud computing is a kind of computing which is highly scalable and use virtualized resources that can be shared by the computer education student.

Cloud computing is a type of computing that relies on shared computing resources rather than having local servers or personal devices to handle applications. Cloud computing according to Jyoti is a type of internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. Jyoti further explained that it is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources which can be rapidly provisioned and released with minimal management effort. In view by Banerjee^[2], cloud computing and storage solutions provide users which computer education student is part of it and enterprises with various capabilities to store and process their data in either privately owned or third-party data centers that may be located far from the user-ranging in distance from across a city to across the world. In the view by Steve^[3], explain that the cloud computing is the delivery of on-demand computing services from applications to storage and processing power typically over the internet and on a pay-as-you-go-basis. Duranti^[1], stated that cloud computing relies on sharing of resources to achieve coherence and economy of scale, similar to a utility (like the electricity grid) over an electricity network. The researchers for explained the clouding computing is a process of delivering/enabling scalable, expandable and almost perfectly elastic software services using internet technologies. In the view of forgoing, Vangie^[4], describes cloud computing as a model for enabling ubiquitous, convenient on-demand network access to a share pool of configurable computing resources which include networks, servers, storage, applications and services. Cloud computing according to Duranti^[1] has its benefits to include, easy access to lesson materials, no more carrying around devices, stability, security of data, shareability and trackability among others. Based on the above, there is need for computer education student to properly make use of cloud computing resources which include networks, servers, storage, applications and services.

Cloud computing networks resources is a computer network that provides network interconnectivity between cloud based or cloud enabled application, services and solutions in which computer education student can use it to share information among the students. Bala explained that cloud computing networks resources is a type of infrastructure where network capabilities and resources are available on demand through a third-party service provider that host the network on a cloud platform. In view by Duranti^[1], cloud computing networks resources can include virtual routers, firewalls and bandwidth and network management software with other tools and functions becoming available as required. Furthermore, Vongie^[4], describe that the use of cloud computing networks resources reduces the number of student devices and the amount needed for networks. The researcher further explained that the third-party service provider manages, secures and maintains the network while the student using the services can access resources on demand and can easily scale and virtualized their network. Bala, explained that the cloud networking resources enables cloud computing to deploy virtual machines and networks, enable big data transfer and ensure low latency. Based on this, computer education students for easy big data transfer will also required to be able to use cloud computing servers resources.

Cloud computing servers resources is a hosted and typically virtual, compute server that is accessed by computer education students over a network. Cloud computing servers resources can also referred to as virtual servers, virtual private servers or virtual platforms^[5]. According to Sultan, a cloud servers resources may also be a compute instance within an on-premises private cloud. The researcher further explains that in this case an enterprise delivers the cloud server to internal users in which computer education student is part it across a local area network and in some cases also to external users across the internet. In the other hand, Vongie^[4], enumerate the benefits of cloud servers to include: stability, scalability, easy management and ease of access among others. Based on this, computer education students need to have access, stability and scalability of information and also be able to make use of cloud computing storage resources.

Cloud computing storage resources are those devices or technology use in the practice of moving data off-site to a service provider for management, access and protection of computer education students information/Lecture materials. Cloud computing storage resources can either replace or complement existing on-premise storage or backup systems. Cloud computing storage resources according to Rich and Sonia is a service model in which data is transmitted and stored on remote storage systems where it is maintained, managed, backed up and made available to users over a network. In view of

Ercan^[5], cloud computing storage resources is classified into three types which include public cloud storage, private cloud storage and hybrid cloud storage. Moreover, in Rich, cloud storage resource is characterized based on a virtualized infrastructure with accessible interfaces, near-instant elasticity and scalability, multi-tenancy and metered resources. Vongie^[4], explained the benefits of cloud storage resources to included utility billing, global availability, ease of use offsite security among others. The use of cloud computing storage resources will make the computer education students to have easy access to backup information/lecture materials in achieving this, there is need for the student to make use of cloud computing application resources.

Cloud computing application resources is an internet-based program where some or all of the processing logic and data storage is processed in the cloud. Computer education student interact with the cloud application resources via. a web browser or a mobile application and the data processing in managed by a combination of the local device and a cloud computing solution. According Zach, described that from the user's perspective, the cloud application behaves like a standard website but the computing and data processing are handled by the cloud via. an API (Application Program Interface) or hybrid of both. In view byDuranti^[1], cloud application resources tasks encompass email, file storage and sharing, order entry, inventory management, word processing, customer relationship management, data collection among others. However, computer education students in other to carryout the listed tasks need to be able to utilize the cloud computing resources.

Utilization is the primary technique wherein success and performance efficiency are determined for computer education students on the use of cloud computing resources. Various educational institutions have started utilizing Cloud computing in a variety of ways. For instance in traditional computing^[6] installed software programs on computer and updated the hardware as per their requirements. Documents were created and stored in the computer. The documents are accessible on their own network but they could be accessed by computers outside the network. Within the cloud computing environment, the software programs are not run from one's personal computer but are rather stored on servers accessed via. the Internet. According to Grossman^[6], cloud computing provides resources and capabilities of Information Technology example, applications, storages, communication, collaboration, infrastructure via. services offered by cloud service provide. The researchers also indicated that cloud computing has various characteristics as shared infrastructure, self-service, pay-per use model, dynamic, virtualized, elastic and scalable. The researchers

utilized cloud computing in the universities because they believed that Cloud computing in academic environment will be benefitted by every student and staff where lots of collaboration and safety of data is needed.

University is an institution of higher education and research which awards academic degrees in various academic disciplines that provide undergraduate and postgraduate of computer education and others. According to Gupta^[7], University is an institution that prepare people to work in various sectors of the economy or areas of culture. On the other hand, the researcher further explained that the University Education means the totality of general and specialized knowledge and skills that enable a university graduate to solve problems that the graduate encounter in industry or to perform scientific research or pedagogical work within the area of specialized knowledge the person has acquired. University students encompasses both male and female students of computer education and other areas.

Cloud computing resources is very important for all the students globally and computer education students will not be left behind. Cloud computing resources have made information/lecture note easy to access, store, share anywhere, anytime and at anyplace. Based on this, there is need to find out the extent of utilization of cloud computing resources by computer education students in Universities in Enugu state. This is what this present study undertakes to find out.

Statement of the problem: The educational sector is faced with series of changes and reforms, it becomes necessary to reflect on matters concerned with the emergence of cloud computing technologies and accessibility of learning, Universities in Enugu state is not harnessing the latest technologies for productivity enhancements as demonstrated by its low rates of cloud penetration. Universities in Enugu state in recent times has witnessed an unprecedented level of insecurity. This has made security threat to be a major issue for the universities in Enugu state and has prompted huge allocation of the state budget to security.

It is expected that educators and organizations is to adopt and adapt to a cloud technology platform to deliver online learning. More online cloud-based applications should be used in Universities in Enugu state, University of Nigeria Nsukka (UNN) and Enugu state University of Science and Technology (ESUTH). Educators and students should adopt many of these cloud computing software services for their projects and assignments for it is simple-to-use and learning-based approach that stands as one such unique cloud-based platform that encourages even technophobes and technology virgins to access teaching and training modules through their smart phones

and laptops. Institutions can utilize their limited faculty and content resources more efficiently by catering to more numbers of students worldwide.

Purpose of the study: The purpose of this study is to find out extent of utilization of cloud computing resources by computer education students in universities in Enugu state, specifically, the study sought to determine:

- The extent of utilization of cloud server's resources by computer education students in universities in Enugu state
- The extent of utilization of cloud storage resources by computer education students in universities in Enugu state
- The extent of utilization of cloud application resources by computer education students in Universities in Enugu state

Research question:

- To what extent does computer education students utilize cloud server's resources
- To what extent does computer education students utilize cloud storage resources?
- To what extent does computer education students utilize cloud application resources?

Hypothesis:

- Ho₁: there is no significant different between male and female student on the extent of utilization of cloud server's resources by computer education students in Universities in Enugu state
- Ho₂: there is no significant different between male and female student on the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state
- Ho₃: there is no significant different between male and female student on the extent of utilization of cloud application resources by computer education students in Universities in Enugu state

Significance of the study: The study will be of benefit to the students, lecturers, Departmental Exam Officers and the graduates of the computer education departments in Universities in Enugu state. University of Nigeria, Nsukka (UNN) and Enugu State University of Science and Technology (ESUTH).

The students will benefit from the findings of this study under purpose one through researches students made from the cloud for their improvement on academic performance. It will also benefit the graduates of computer education by their transcript which is been stored on the cloud for retrieval at any given time when needed.

The findings under purpose two will equally be of benefit to students of computer education by their engagement in the usage of cloud in finding solutions to their problems for the improvement of their academic performance.

Lecturers will benefit from the findings of this study under purpose three by giving accurate and up-to-date account of her student's results and releasing students result without much delay since results can be backed-up on the cloud for easy and faster retrieval. It will also benefit the Departmental Exam Officers for student's report keeping.

Finally, the findings under purpose four will equally benefit the students of computer education student in Enugu state universities. University of Nigeria, Nsukka (UNN) and Enugu State Science and Technology (ESUTH) in the improvement of their academic performance through the use of webmail service such as Hotmail, G Mail and Yahoo Mail.

Scope of the study: This study was delimited to extent of utilization of cloud computing resources by computer education students in universities in Enugu state. University of Nigeria Nsukka (UNN) and Enugu State University of Science and Technology (ESUTH) where cloud computing resources were utilized. Respondents for this study were restricted to students in computer education department university of Nigeria Nsukka (UNN) and Enugu State University of Science and Technology (ESUTH). The study specifically covered capturing of cloud computing, computer education student's utilization of cloud computing resources.

MATERIALS AND METHODS

Research design: This study will adopt the survey research. The survey research studies deal with both large and small populations by selecting and studying samples chosen from the populations to discover the relative incidence, distribution and interrelations of sociological and psychological variables^[8]. The researcher considered survey design as the most appropriate design because according to Olaitan *et al.*^[9] it is one in which the entire population or representative sample is studied by collecting and analyzing data from a group through the use of questionnaire. The design was considered suitable, since this study solicited information from the students of Universities within Enugu state on the extent of utilization of cloud computing resources by computer education students in university through the use of structured questionnaire.

Area of the study: This study was conducted in the two government owned universities in Enugu state namely University of Nigeria, Nsukka and Enugu state University

of Science and Technology. Enugu state is one of the states in the Eastern part of Nigeria. The state shares borders with Abia State and Imo state to the South, Ebonyi state to the East, Benue state to the Northeast, Kogi state to the northwest and Anambra State to the West.

The choice of this area was based on the fact of its proximity as the researcher had to make several trips for preliminary investigations in order to ascertain or authenticate facts and figures. The universities have almost the same characteristics and present the same problems. Their student makes use of cloud computing resources and there is need to know the extent of the usage.

Population: The population of this study was 1020 respondents which was made up of the computer education student's in the study area.

Sample: Multistage sampling technique was used for this study. According to Philip, multistage sampling techniques refers to sampling plans where the sampling is carried out in stages using smaller and smaller sampling units at each stage.

First: Purposive sampling technique was used to select the two universities out of five university in the study area.

Second: The proportionate sampling technique was used for the study. In using the technique, 10% of the respondents of different categories was sampled for the study. This is in line with Nwana in Onah *et al.*^[8] who recommends that when the entire population is large, only a small portion of it is to constitute the sample and if such population is a few thousands, five to ten per cent will do. Based on this, the ten per cent sample that will be drawn from the population of 1020 students is 102 comprised of student from ESUTH and UNN.

Instrument for data collection: The instrument used for data collection in this study was structured questionnaire. The questionnaire items were generated based on the information gathered from the review of related literature. The response scale was as follows:

- Very High Extent (VHE) - 4 points
- High Extent (HE) - 3 points
- Low Extent (LE) - 2 points
- Very Little Extent (VLE) - 1 points
- Validation of Instrument

The questionnaire was subjected to face validation by giving it to (5) experts. Three lectures from the Department of Computer and Robotics Education, University of Nigeria, Nsukka and (2) expert form Information and Communication Technology (ICT),

University of Nigeria, Nsukka. Each of these validates was served with a copy of the instrument for validation. Based on their correction and suggestions, amendments were made on the instrument before a final copy was produced and used for this study.

Reliability of the instrument: The reliability of the instrument will be established using Cronbach alpha formula. The internal consistency of the items will be established by a single administration of the instrument to a similar group in Ebonyi state.

Method of data collection: Copies of the questionnaire were administered on the respondents with the help of 3 research assistants. The research assistants collected copies of completed questionnaire from the respondents after one week. The total of 102 copies of the questionnaire items were returned which indicated 96% return rate.

It was this number that were analyzed to generate data used for answering the research questions and testing of the null hypothesis for the distribution and return of the questionnaire.

Method of data analysis: The data collected from the respondents were analyzed using mean, standard deviation and t-test statistics. Statistical Package for the Social Sciences (SPSS) was used also to ensure accuracy. The mean and standard deviation were used to answer the research questions. The mean for the responses scale was 2.50. The cut-off point was 2.50 while with an interval scale of 0.05 level of significance.

Any item with a mean rating of 2.50 and above was regarded as high extent while any item with a mean rating <2.50 was regarded as low extent. The standard deviation was used to determine the closeness or otherwise of the opinions of the respondents from the group mean. The t-test statistics was used to test the three null hypothesis at probability of 0.05 level of significance. Any hypothesis whose significance "sig (2-tailed)" levels are less than or equal to the stated 0.05 level of significance, the null hypothesis was rejected but if significance "sig (2-tailed)" levels are >0.05 level of significance, the null hypothesis was accepted.

RESULTS AND DISCUSSION

Research question one: To what extent does computer education students utilize cloud server's resources. The data presented in Table 1 showed that the mean ratings of the response of the respondents on the 5 identified items relating to the extent of utilization of cloud server's resources by computer education students in Universities in Enugu state had mean ranging from 3.43-3.98 which are all greater than the cut-off point of 2.50 on a 4 rating scale. The standard deviation values for the 5 items ranged from 0.14-0.54 which showed that the

Table 1: Mean response and standard deviation extent does computer education students utilize cloud server's resources

Items statement	\bar{X}	SD		Decision
		N = 102		
1. I utilize cloud in disaster recovery	3.76	0.43		HE
2. I utilize cloud to reduce downtime in cloud computing	3.43	0.54		HE
3. I utilize cloud in scalability in case of traffic data on the website	3.98	0.14		HE
4. I utilize cloud to switch to another server in case of error	3.87	0.34		HE
5. I utilize cloud to centralized management system	3.43	0.54		HE

Table 2: Mean response and standard deviation extent does computer education students utilize cloud storage resources

Items statement	\bar{X}	SD		Decision
		N = 102		
6. I use cloud in scalable storage	3.98	0.14		HE
7. I utilize cloud in disaster recovery	3.87	0.34		HE
8. I utilize cloud to document editing	3.98	0.14		HE
9. I utilize cloud in e-signatures	3.87	0.34		HE
10. I utilize cloud in mobile phone access or native application	3.74	0.44		HE
11. I utilize cloud in Portal white-labeling	3.54	0.50		HE
12. I utilize cloud in server backup	3.76	0.43		HE
13. I utilize cloud in idle backup	3.43	0.54		HE
14. I utilize cloud in external drive backup	3.98	0.14		HE
15. I utilize cloud in mobile passcode	3.87	0.34		HE
16. I utilize cloud in device and location tracking	3.43	0.54		HE
17. I utilize cloud in multi-factor authentication/verification process	3.98	0.14		HE

Table 3: Mean response and standard deviation extent does computer education students utilize cloud application resources

Items statement	\bar{X}	SD		Decision
		N = 102		
18. I utilize cloud to submit seminar papers through online	3.87	0.34		HE
19. I utilize cloud to check the research works undertaken in the areas related to my research area in the global contest	3.43	0.54		HE
20. I utilize cloud to collect data through web tools for preparing an article	3.98	0.14		HE
21. I utilize cloud to access web resources anytime for enhancing my computer skill	3.87	0.34		HE
22. I use cloud to visit educational website for new updates	3.98	0.14		HE
23. I use cloud for web based materials for my study	3.87	0.34		HE
24. I use cloud to download statistical package for data analysis	3.74	0.44		HE
25. I use cloud to download free software with the help of web tools	3.54	0.50		HE
26. I use cloud to Google applications for my research related works	3.76	0.43		HE
27. I use cloud to read many research articles through online before selecting topics for their seminar presentations	3.43	0.54		HE
28. I use cloud to include YouTube videos in my paper presentations	3.98	0.14		HE
29. I use cloud to post my prepared presentations in internet	3.87	0.34		HE
30. I use cloud to enjoy storage area provided by web tools	3.43	0.54		HE
31. I utilize cloud in online money transaction for my study purposes	3.98	0.14		HE

X = Mean; SD = Standard Deviation; N = Number of the respondents

respondents were not far from one another in their responses and that their responses were not far from the mean. This shows that all the 5 items are the extent of utilization of cloud server's resources by computer education students in Universities in Enugu state.

Research question two: To what extent does computer education students utilize cloud storage resources?

The data presented in Table 2 showed that the mean ratings of the response of the respondents on the 12 identified items relating to the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state had mean ranging from 3.43-3.98 which are all greater than the cut-off point of 2.50 on a 4 rating scale. The standard deviation values for the 12 items ranged from 0.14-0.54 which showed that the respondents were not far from one another in their

responses and that their responses were not far from the mean. This shows that all the 12 items are the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state.

Research question three: To what extent does computer education students utilize cloud application resources?

The data presented in Table 3 showed that the mean ratings of the response of the respondents on the 14 identified items relating to the extent of utilization of cloud application resources by computer education students in Universities in Enugu state had mean ranging from 3.43-3.98 which are all greater than the cut-off point of 2.50 on a 4 rating scale. The standard deviation values for the 14 items ranged from 0.14-0.54 which showed that the respondents were not far from one another in their responses and that their responses were not far from the

Table 4: t-test analysis on the extent of utilization of cloud network resources by computer education students in Universities in Enugu state

Items statement	Groups	X	SD	df	T-cal	p-values	Remarks
I utilize cloud in in-house network	Male	3.38	0.55	100	0.12	0.21	NS
	Female	3.51	0.51				
I utilize cloud to share data/information	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				
Use I utilize cloud network to share single internet connection	Male	3.95	0.22	100	43.19	0.10	NS
	Female	3.76	0.43				
I utilize cloud to control over sharing permissions	Male	3.87	0.34	100	46.39	0.20	NS
	Female	3.54	0.50				
I utilize cloud in password-protected sharing	Male	3.59	0.50	100	0.85	0.21	NS
	Female	3.46	0.50				

Table 5: t-test analysis on the extent of utilization of cloud storage resources by computer Education Students in Universities in Enugu state

Items statement	Groups	X	SD	df	T-cal	p-values	Remark
I use cloud in Scalable storage	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				
I utilize cloud in disaster recovery	Male	3.95	0.22	100	43.19	0.05	NS
	Female	3.76	0.43				
I utilize cloud to document editing	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				
I utilize cloud in e-signatures	Male	3.95	0.22	100	43.19	0.10	NS
	Female	3.76	0.43				
I utilize cloud in mobile phone access or native application	Male	3.87	0.34	100	46.39	0.20	NS
	Female	3.54	0.50				
I utilize cloud in Portal white-labeling	Male	3.59	0.50	100	0.85	0.21	NS
	Female	3.46	0.50				
I utilize cloud in server backup	Male	3.89	0.32	100	49.22	0.07	NS
	Female	3.59	0.50				
I utilize cloud in idle backup	Male	3.38	0.55	100	0.12	0.21	NS
	Female	3.51	0.51				
I utilize cloud in external drive backup	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				
I utilize cloud in mobile passcode	Male	3.95	0.22	100	43.19	0.06	NS
	Female	3.76	0.43				
I utilize cloud in device and location tracking	Male	3.38	0.55	100	0.12	0.21	NS
	Female	3.51	0.51				
I utilize cloud in Multi-factor authentication/verification process	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				

X = Mean; SD = Standard Deviation; DF= Degree of Freedom; S= Significance; NS= Not Significance

mean. This shows that all the 14 items are the extent of utilization of cloud application resources by computer education students in Universities in Enugu state.

Hypothesis:

- H₀₁: there is no significant different between male and female student on the extent of utilization of cloud network resources by computer education students in Universities in Enugu state

Table 4 shows the t-test scores of male and female students on the extent of utilization of cloud network resources by computer education students in universities in Enugu state. The analysis shows that the 5 identified items on the extent of utilization of cloud network resources by computer education students in Universities in Enugu state had their p-values ranged from 0.08-0.21 which are all >0.05 level of significance. This indicates that there is no significance difference on the responses of male and female students on the extent of utilization of cloud network resources by computer Education Students in Universities in Enugu state:

- H₀₂: there is no significant different between male and female student on the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state

Table 5 shows the t-test scores of male and female students on the extent of utilization of cloud storage resources by computer education students in universities in Enugu state. The analysis shows that the 12 identified items on the extent of utilization of cloud storage resources by computer Education Students in Universities in Enugu state had their p-values ranged from 0.05-0.10 which are all >0.05 level of significance. This indicates that there is no significance difference on the responses of male and female students on the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state:

- H₀₃: there is no significant different between male and female student on the extent of utilization of cloud application resources by computer education students in Universities in Enugu state

Table 6: t-test analysis on the extent of utilization of cloud application resources by computer Education Students in Universities in Enugu state

Items statement	Groups	X	SD	df	T-cal	p-values	Remarks
23. I utilize cloud to submit seminar papers through online	Male	3.95	0.22	100	43.19	0.08	NS
	Female	3.76	0.43				
24. I utilize cloud to check the research works undertaken in the areas related to my research area in the global contest	Male	3.38	0.55	100	0.12	0.00	S
	Female	3.51	0.51				
25. I utilize cloud to collect data through web tools for preparing an article	Male	4.00	0.00	100	13.63	0.08	NS
	Female	3.95	0.22				
26. I utilize cloud to access web resources anytime for enhancing my computer skill	Male	3.95	0.22	100	43.19	0.00	S
	Female	3.76	0.43				
27. I use cloud to visit educational website for new updates	Male	4.00	0.00	100	13.63	0.00	S
	Female	3.95	0.22				
28. I use cloud for web based materials for my study	Male	3.95	0.22	100	43.19	0.21	NS
	Female	3.76	0.43				
29. I use cloud to download statistical package for data analysis	Male	3.87	0.34	100	46.39	0.10	NS
	Female	3.54	0.50				
30. I use cloud to download free software with the help of web tools	Male	3.59	0.50	100	0.85	0.21	NS
	Female	3.46	0.50				
31. I use cloud to Google applications for my research related works	Male	3.89	0.32	100	49.22	0.08	NS
	Female	3.59	0.50				
32. I use cloud to read many research articles through online before selecting topics for their seminar presentations	Male	3.38	0.55	100	0.12	0.08	NS
	Female	3.51	0.51				
33. I use cloud to include YouTube videos in my paper presentations	Male	4.00	0.00	100	13.63	0.21	NS
	Female	3.95	0.22				
34. I use cloud to post my prepared presentations in internet	Male	3.95	0.22	100	43.19	0.08	NS
	Female	3.76	0.43				
35. I use cloud to enjoy Storage area provided by web tools	Male	3.38	0.55	100	0.12	0.10	NS
	Female	3.51	0.51				
36. I utilize cloud in online money transaction for my study purposes	Male	4.00	0.00	100	13.63	0.21	NS
	Female	3.95	0.22				

X = Mean; SD = Standard Deviation; DF = Degree of Freedom; S = Significance; NS = Not Significance

Table 6 shows the t-test scores of male and female students on the extent of utilization of cloud application resources by computer education students in universities in Enugu state. The analysis shows that the 14 identified items on the extent of utilization of cloud application resources by computer education students in universities in Enugu state had their p-values ranged from 0.00-0.21 which are all >0.05 level of significance. This indicates that there is no significance difference on the responses of male and female students on the extent of utilization of cloud storage resources by computer education students in Universities in Enugu state.

The p-value of the remaining items male and female students on the extent of utilization of cloud application resources by computer education students in Universities in Enugu state, specifically items 24, 26 and 27 are >0.05 level of significance. Thus there is significant differences on the responses on the responses male and female students on the extent of utilization of cloud application resources by computer education students in Universities in Enugu state.

Discussion of findings: The findings of the study are organized and discussed according to the research questions answered and hypothesis tested. Extent of utilization of cloud server's resources by computer education students in Universities in Enugu state.

The data presented in Table 1 provided answer to research question 1. The findings revealed that the mean score for the extent of utilization of cloud server resources by computer education students in Universities in Enugu state is >2.50 which means that it's very high that computer education students make use of cloud servers resources in universities in Enugu state. t- test analysis was used to test the first hypothesis; Table 4 shows that p-values are greater than the confidence level of 0.05, thus, indicating that there was no significant different between male and female student on the extent of utilization of cloud server resources by computer education students in Universities in Enugu state. The finding is similar to the view of Sultan (2010) which states that a cloud servers resources may also be a compute instance within an on-premises private cloud. The author further explains that in this case an enterprise delivers the cloud server to internal users in which computer education student is part it across a local area network and in some cases also to external users across the internet. In the other hand, Vongie^[4], enumerate the benefits of cloud servers to include: stability, scalability, easy management and ease of access among others. Extent of utilization of cloud storage resources by computer education students in Universities in Enugu state.

The data presented in Table 2 provided answer to research question 2. The findings revealed that the mean score for the extent of utilization of cloud storage resources by computer education students in universities

in Enugu state is >2.50 which means that it's very high that computer education students make use of cloud storage resources in Universities in Enugu state. T- test analysis was used to test the first hypothesis; Table 5 shows that p-values are greater than the confidence level of 0.05, thus, indicating that there was no significant different between male and female student on the extent of utilization of cloud storage resources by computer education students in universities in Enugu state. The finding is similar to the view by Vongie^[4] which explained the benefits of cloud storage resources to included utility billing, global availability, ease of use offsite security among others. The use of cloud computing storage resources will make the computer education students to have easy access to backup information/lecture materials in achieving this, there is need for the student to make use of cloud computing application resources. Extent of utilization of cloud application resources by computer education students in Universities in Enugu state.

The data presented in Table 3 provided answer to research question 3. The findings revealed that the mean score for the extent of utilization of cloud application resources by computer education students in Universities in Enugu state is > 2.50 which means that it's very high that computer education students make use of cloud application resources in Universities in Enugu state. t- test analysis was used to test the first hypothesis; Table 6 shows that p-values are greater than the confidence level of 0.05, thus, indicating that there was no significant different between male and female student on the extent of utilization of cloud application resources by computer education students in universities in Enugu state. The finding is similar to the view by Doolen which said that cloud computing application provides long term mailing services and web based applications which are accessible with a variety of computer and mobile platforms. The students can freely share their data in the cloud computing application. Usefulness of cloud computing applications in education by availing the services and cloud computing the following benefits can enjoy in the domain of education; the students can submit their seminar papers through online, students check the research works undertaken in the areas related to their research area in the global contest, student can collect data through web tools for preparing an article, Student can access at any time the web resources for enhancing their computer skill, students can visit the educational website for new updates, students can use web based materials for their study, students can download statistical package for data analysis, students can download free software with the help of web tools, students can use Google applications for their research related works,

students can read many research articles through online before selecting topics for their seminar presentations. Students can include YouTube videos in their study presentations, students can post their prepared presentations in internet, students can enjoy storage area provided by web tools, students can use online money transaction for their study purposes and these apart they can enjoy a lot of benefit's exploiting cloud computing facilities. According Zach, described that from the user's perspective, the cloud application behaves like a standard website but the computing and data processing are handled by the cloud via. an API (Application Program Interface) or hybrid of both. In view by Duranti^[1], cloud application resources tasks encompass email, file storage and sharing, order entry, inventory management, word processing, customer relationship management, data collection among others.

Implications of the study: The findings of this study have implications for staff, students of computer education department and the entire universities in Enugu state.

The findings of this study have far reaching implication for Utilization of cloud computing resources by Computer Education Students in Universities in Enugu State. The study found out that the students of Computer Education utilize cloud computing resources in universities in Enugu state. The implication of this study to curriculum planners is that they should update appropriate curriculum, they should include the identifies cloud resources so that students will continue utilizing it. Having found out utilization of cloud computing resources by computer education students in universities in Enugu state. There is also need for lecturers to make use of it in the class so that students will adapt to the use of cloud computing. Moreover, the findings that emerged from this study will be of important to students. It is therefore, implied that follow up lessons aimed at boosting the interest of the students on utilization of cloud computing resources by computer education students in universities in Enugu state.

CONCLUSION

Cloud computing are new in education sector, how to use cloud computing in universities in Enugu taught to staff in charge of students 'results and students equally for the improvement of their academic performance. This will enable them carry out their work properly in cloud computing. Lecturers should be allowed to have access to Management Information System (MIS) website to enable them verify the authenticity and accuracy of student's or transcript before issuance. This will avoid manipulation and forgery of results in universities in Enugu state.

RECOMMENDATIONS

Based on the findings and the conclusion drawn from this study, the following recommendations were made: The ministry of Education may use the findings of this research to organize seminars, conferences and workshops for retraining of teachers on the utilization of cloud computing resources by computer education students in Universities in Enugu state. Government should involve in the provision of the equipment and facilities to give more opportunity to students to learn. They should also provide stable power supply to enable the teacher to teach with the facilities. There should be adequate efforts by the government and its relevant agencies to provide framework that will ensure timely and constant in-service training to teachers in order to keep updating the required skills and strategie for instructional delivery.

The success of any educational programme depends on the level of availability of resources provided for the programme. Therefore, it is recommended that adequate human and instructional materials be made available by the government for effective utilization of cloud computing resources by computer education students in Universities in Enugu state.

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