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Integration of Cloud Computing in Teaching-Learning Process: The Nigerian Principal's Perspective

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Abstract

Objectives: To investigate the perceptions of principals in integrating cloud computing in teaching-learning process. Specifically, to consider the perceptions of male and female principals in integrating cloud computing in teaching-learning process. **Method:** The researcher used the survey research method with the aid of well-structured Perception of Principals in Integrating Cloud Computing in Teaching-Learning Process Questionnaire (PPICCTLPQ). Two research questions and hypotheses were formulated to guide the study. The population of the study comprised of all principals in public secondary schools in Ethiope East Local Government Area of Delta State. The twenty-four (24) principals from the different public secondary schools in the study area made up the sample size. Reliability test using Crombach Alpha with coefficient of 0.81 proved that the instrument was reliable. Chi-Square analysis was used to test the stated hypotheses at 0.05 level of significance. **Findings:** twenty-one (21) questionnaires were returned completed which gave a response rate of 87.5%. The demographic distribution showed that majority of the principals encountered were male accounting for 13(61.90%) followed by female accounting for 8(38.10%). Based on the response obtained from research question one, 20(9.24%) strongly agreed while 8(38.10%) strongly disagreed. **Novelty:** The study showed that there was significant difference in the integration of cloud computing in teaching and learning process among principals in public secondary schools in the study area. The study recommends that government and stake holders in the education sector should ensure provision of necessary facilities and facilitate the orientation of principals and school teachers on the relevance of cloud computing.

Keywords: Cloud computing; integration; principal; teachinglearning

1 Introduction

Cloud computing has taken major chunk of attention from various communities in society like researches, student, business, consumer and government organization[1]. As the human needs cropped and paved way for digitization of information a new buzzword GIG data evolved[2]. Big data is the main source for coming of cloud

computing in the show; everyday lots of data in the size are uploaded in the digital world which required lots of storage and computing resources[3]. Cloud Computing, also known as utility computing, delivering the service as software, platform and infrastructure as a service in pay- as- you-go model to consumers. It's just getting anything for the pay model[2].

Educational system globally has expanded gradually with slow object towards social staffing[4]. Education has evolved from teacher centric to learner centric (multiple intelligence of learner) of teaching can now be made easy with support of cloud computing where you get everything and now the teaching methodologies like chalk - black board, physical interaction took a new transition into a fast-growing online phase. E-learning is one of the major requirements in the educational environment and a major solution to modern day bridge in communication. With the advent of awareness and modernization of present society, quite a good number of people are receiving education, a series of new problems have emerged[5]. For example: As teaching methods change, the existing teaching- learning methods cannot meet demand and need quite a good amount of infrastructure with high prices and with the constant expansion of education, the existing teaching facilities also need to constantly update. More importantly the present generation student desires to update the very fast changing world and want to be in pace with others of this global village. When Cloud Computing appears, it provides a new solution to establish a unified, open and flexible network teaching platform and reduce the hardware input[6].

1.1 Concept and Model Services of Cloud Computing

Cloud computing, a process of service delivery over the internet involving the application and use of hardware and software for data storage and services provision[7]. It is seen as a new phase in IT[8] that enables the supply and utilization of various services through a collection of technological applications[9] accessible for use by many real time users[10]Figure 1.
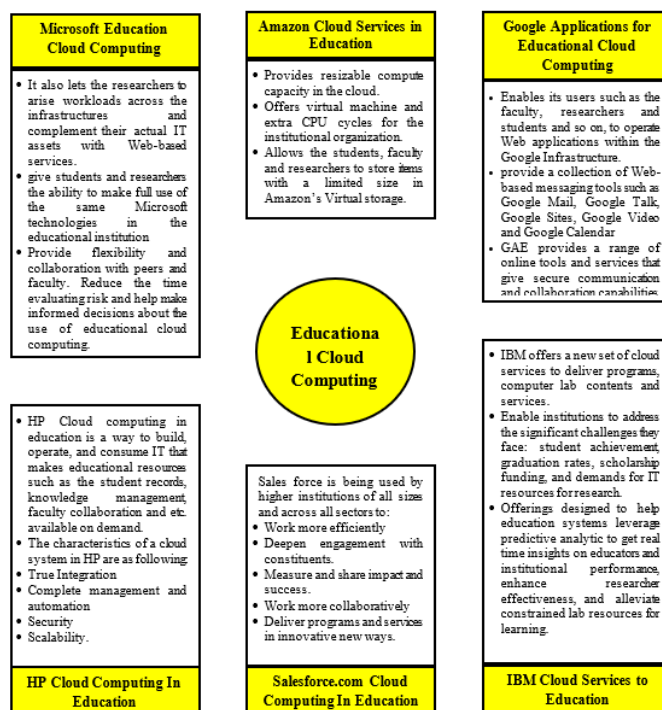
Fig 1. Types of Cloud Computing and their Applications in Education

1.2 Characteristics of Cloud Computing

On-demand Self-S ervice: It makes provision for storage and processing of information void of human intervention.

Access to Broad Network: Resources of cloud computing comprises several devices ranging from mobile and smart devices which access resources over network system.

Large Pool of Resources: Users of cloud platform have access to large cloud resources and also have ability of preference as to which resources are of importance at a particular time and location.

Rapid Elasticity: These cloud resources are always available with high scalability ensuring optimal usage.

Measured Service: With the availability of cloud computing, the rate of online resources consumption can easily be measured and controlled using surveillance system [3] Figure 2.
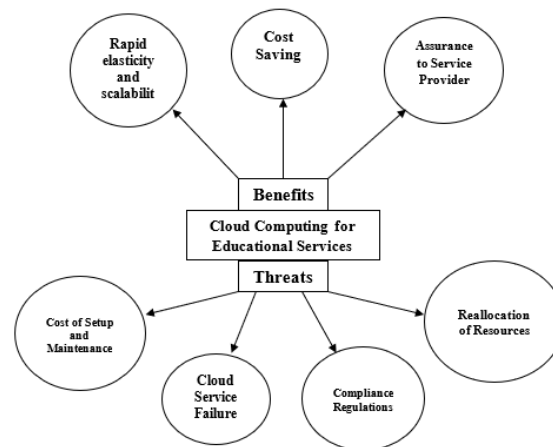

Fig 2. Benefits and potential threats to cloudcomputing for educational services

1.3 Statement of the Problems

The onset of cloud system of computing has greatly facilitated the rate of knowledge acquisition and paved way for countries with developed systems and advance technological know-how to improve their systems in policy making, education, creative science, health and human resources. Cloud computing have changed the relationship between students and teacher and has made it open and intimate. The idea of sharing knowledge and the capability of using new source for learning is enhanced by using cloud computing. The cloud computing, instead of been an avenue for research and information awareness has become barrier to academic performance of students. Some students surf or browse the internet for irrelevant materials online; indulge in activities that will undermine their academic pursuit even ruin carriers of students who chose the negative activities such as internet crime. There are some who have the right intention of utilizing the internet facility provided by university management since they cannot effort to own an internet gadget of their own. Unfortunately, they are often deprive either as a result of system breakdown, congestion or insufficient computer system available for browsing, for such students, their hope for internet browsing thwarted or lost. The purpose of this study is to investigate the perceptions of principals in integrating cloud computing in teaching- learning process.

1.4 Significance of the study

The world has become a global village as a result of information technology. The benefit of the cloud computing is felt in the entire human existence. This study will help school principals in effective administrative and managerial processes. The study will also help school teachers and administrators in the area of research and administrative styles. Students will also learn through the study, the positive effects of the internet. Learning online is one of the great advantages of the cloud computing. The study will help the students to have insight on how to enrich themselves with internet browsing and improve their academic performance. The internet has developed and become more sophisticated that lecturers and administrators can obtain information on how to improve their efficiencies right there at the comfort of their desks. Also, they can register for real time seminars and workshop on the internet and get feedback on schedules through their email addresses. The school administrators can get updates on latest school facilities on the internet.

1.5 Research Question and Hypotheses

The present study aims to test and validate the following research question and hypotheses:

RQ: What are the perceptions of principals in integrating cloud computing in teaching-learning process?

Ho: There is no significant difference between the perception of principals and the integrating cloud computing in teaching-learning process

2 Methodology and Research Design

The researcher used the survey research method. The survey research method is a type of descriptive method in educational and behavioral research. The advantage of the survey method is that it gathered data of a particular point with the intention of describing the nature of existing conditions. It attempts to describe the characteristics of the whole population of students in Senior Secondary School or situation by studying representative samples.

2.1 Population of the Study

Twenty-four (24) principals from the 24 public secondary schools in the study area were used as the sample size for the study.

2.2 Instrumentation

A questionnaire was specifically designed to obtain the necessary data required for the execution of this study. The questionnaire adopted the four-point Likert scale to measure respondent's perception on the topic and ranked as follows:

SA: Strongly agree – 4; A: Agree – 3; D: Disagree – 2; SD: Strongly Disagree - 1.

In order to ascertain the reliability of the research instrument, it was test- run in two schools not used for the main study and using Crombach Alpha a coefficient of 0.81 was obtained. This proved that the questionnaire was reliable.

2.3 Collection and Analysis of Data

The researcher visited the schools under study and administered the questionnaire on the respondents during their working hour via hand-to-hand and collected it same day from the respondents. In analyzing the data collected for the study, the researcher used simple percentage in answering the research questions. The formulae used for calculation is number of responses divided by the total number of respondents multiplied by one hundred (100). However, chi-square was used to test the stated hypotheses at 0.05 level of significance. The formula of Chi-square (x^2) is stated mathematically as;

$$(x^2) = \sum \frac{(o-E)^2}{E}$$

Where
Chi-square = (x^2)
∑ = summation symbol
O = observed values
E= expected value

3 Results

3.1 Demographics

From the twenty-four secondary school principals sampled using questionnaires, twenty-one of the principals completely responded to the questions while three were incomplete. This gave a response rate of 87.5%. The demographic distribution of principals across the secondary schools in the study area showed that majority of the principals were Male accounting for 13(61.90%) while female accounted for 8(38.10%).

3.2 Research Question and Hypotheses

The response from the research questions distributed to principals within the study area are shown in Table 1. From the results obtained, majority of the respondents strongly agreed to the information contained in all research questions. Utilization of cloud computing in performing basic task as viewed by principals in item 1 of the research question showed that 7(33.33) respondents strongly agreed, 8(38.09) agreed while 3(14.28) disagreed and 3 (14.28) also strongly disagreed. Item 2 showed that higher respondents 9(42.85) strongly agreed, 8(38.09) agreed, 2(9.52) disagreed while 4(19.04) strongly disagreed to the fact that utilization of cloud computing aid in the operation of common technology. To item 3 in the raised questions, the researcher

observed that 5(23.80) respondents strongly agreed, 12(57.14) agreed while 4(19.04) disagreed to the fact that cloud computing aid in effective communication and collaboration. Also, in the utilization of cloud computing for locating, evaluating and collection of educational resources, the researcher recorded that 6(28.57) strongly agreed, 7(33.33) agreed, 5(23.80) disagreed while 3(14.28) strongly disagreed to the question raised.

Table 1. Perceptions of principals in integrating cloud computing in teaching-learning process

S/N	Items	SA	A	D	SD
1	Perform basic file management tasks	7(33.33)	8(38.09)	3(14.28)	3(14.28)
2	Operate common technology	9(42.85)	8(38.09)	2(9.52)	4(19.04)
3	Use technology to communicate and collaborate	5(23.80)	12(57.14)	4(19.04)	0(0.0)
4	Use technology to locate, evaluate, and collect educational research	6(28.57)	7(33.33)	5(23.80)	3(14.28)

Table 2 shows the results of Chi-Square analysis for the evaluation of significance between the perception of principals and the integration of cloud computing in the teaching and learning process. The hypotheses tested showed that there is no significance difference (p>0.05) between principals' perception and the integration of cloud computing in the teaching and learning processes among secondary school students in Ethiope East Local Government Area of Delta State, Nigeria.

Table 2. Chi-Square analyses

SA	A	D	SD	Total	Df	X^2-Cal	X^2-Crit	Remark
7	8	3	3	21				
9	6	2	4	21				
5	12	4	0	21	9	10.5987	16.919	Insignificant
6	7	5	3	21				
27	**33**	**14**	**10**	**84**				

4 Discussion

ICT and cloud-computing are important components of teaching and learning in schools that has required greater emphasis over time. Cloud computing is an ICT compliance technology which has a very big role to play in educational teaching and learning, anytime and anywhere possible[11]. The present study evaluated the effectiveness of cloud computing in terms of information retrieval, storage, and usage, and the result conforms with that of Chandra and Malaya[11] which stated that application and utilization of cloud computing has the ability to provide storage and computational resources as part of its services. Studies has shown that cloud computing facilitates the enhancement of teaching and learning processes, enables individualization of learning by teachers based on performance data as well as enabling teachers and lecturers in the arrangement of educational resources and service delivery[12–14]. The results obtained from this study conforms with the research reported by[15] that the main purpose and benefits associated with cloud computing is its user-friendliness which allows access to software and data ability, and also facilitates sharing of learning materials. Similar report by[16] also stated that cloud computing facilitates learning and teaching conditions.

The hypotheses stated for the study showed that there was significant difference in the perception of principals on the idea of cloud computing in educational teaching and learning processes. This conforms with the results of[17], who held positive attitudes towards ICT and cloud computing in the process of teaching and learning as well as for the purpose of fulfilling their administrative and managerial functions. This is also consistent with results from other studies[18,19].

5 Conclusion and Recommendations

The result showed no significant different in the perception of principals and the integration of cloud-computing in teaching and learning processes in secondary schools. The study recommends that government and stake holders in the education sector should ensure provision of necessary facilities and facilitate the orientation of principals and school teachers on the relevance of cloud computing.

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