

# Effect of ICT on Academic Achievement of Secondary School Pupil in Cuttack District

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**Abstract:** Information Communication Technology (ICT) has revolutionized education by providing fresh opportunities for both teaching and learning. In the present study the researcher studied the impact of information communication technology on academic success of secondary school students. The objectives of the research were to examine the use of ICT as a Tool in classroom teaching. To study the effect of ICT on teaching learning process. To compare achievement of the ICT used students and non-used students. And also, the hypothesis of this research was like: - There is significant difference between ICT used students' academic success and non-used ICT students' academic success. There is significant difference with ICT as a tool of teaching and learning and traditional method of teaching and learning. All the secondary school students of Cuttack district were the population for the study whereas 40 number of ninth grade students from two different school was the sample taken by the researcher for the study. The researcher used descriptive survey method as well as questionnaire tool for collection of the data and mean and standard deviation technique for data analysis. lastly the researcher founded that there was a positive impact of ICT on academic performance of secondary school students

**Keywords:** ICT, Secondary Schools, Academic Achievement, Effect.

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## I. INTRODUCTION

Over the past twenty years, educational institutions have made significant investments in information and communication technologies, as ICT has profoundly influenced academic structures and the processes of teaching and learning. A crucial question arises regarding the actual effects of these technologies on student performance and the overall value of education. This relates to research studies such as "The Impact of Information Communication Technology on the Academic Performance of Secondary School Students in Cuttack District." ICT refers to the technologies that facilitate access to information through telecommunications. Although it is akin to information technology (IT), it focuses more on communication technologies. This encompasses the internet, wireless networks, mobile devices, and various communication platforms. Moreover, ICT is used to characterize the integration of audiovisual networks and telephone systems with computer networks via a consolidated cabling or connection system.

The influence of information and communication technology (ICT) on education along with its current role in utilizing digital media, mainly computers and the internet, to enhance teaching and learning. ICT encompasses the technologies that enable the handling and data repository through electronic methods, offering a variety of effective

instruments. These tools can assist in changing the traditional isolated, teacher-focused, and text-dependent classrooms into dynamic environments that promote interactive knowledge sharing among students. Starting from this juncture, the goals of the research are twofold: first, we outline the key discoveries of this extensive body of literature, and second, we offer two complementary explanations for the contradictory results. Our initial explanation implies that most existing studies have focused on the direct impacts of ICT, while a more appropriate approach would be to investigate the indirect effects via traditional means. Given that student success is largely influenced by a student's characteristics, ICT might affect these determinants and, as a result, the educational outcomes. The differences observed in student performances are therefore more connected to the varying effects of ICT on typical factors. The direct relationship between ICT usage and student performance has been the subject of extensive scholarly research over the past twenty years. Numerous studies have sought to elucidate the role and added value of these technologies within classrooms and their influence on student performance. The initial body of literature investigated the effects of computer usage. With the advent of the internet revolution, there has been a shift in focus towards examining the impact of online activities, including internet usage, educational online platforms, digital devices, blogging, and wikis, among others. Muh Amad Saqib khan, infanullach khan et.al (vol.5.no.1. (2015)- "the impact of ICT on the students' performance: A review of

access to information". A sample of 50 respondents was selected from the department of political science, GOMAL university, D era ISMAIL khan, Khyber PAKHTUNKHWA Pakistan. However, related literatures were reviewed from text book, journal and past researchers. The research instruments were questionnaire which was statically analyzed with contingency tables while the hypotheses were tested by using the mean statistic. The results of the present study showed a diverse response of the student regarding the impact of ICTs on the students and their access to information. Nicholas E. Okoda (2016), volume IV, ISSN:2320-3145- "Information and communication technology (ICT) and student academic performance in Biology in senior secondary school in Rivers State". The case was conducted through pre-test post-test experimental and control. The sample was collected 120 students were randomly selected and given 50 items biology achievement test (BAT) before and after the use of ICT for 6 months. The results were analyzed using the mean, standard deviation (SD) and T-test at 0.05 level of significant. The result shows that students taught with computer performed better than those using conventional method. The result further revealed that male and female students were affected positively and equally by the use of ICT instructional packages in teaching biology. Ikwuka, o. I, Adige Joseph Eluemunor Henry (vol.4 (2017) (ISSN (online)2348-7968, [www.ijiset.com](http://www.ijiset.com))- "Effect of ICT on secondary school students' academic performance in Christian religious studies in OSHIMILI north local Government area". A research study utilized an experimental design involving pre-tests and post-tests with a control group using a pre-existing class. The findings indicated that students instructed with ICT demonstrated superior academic performance in CRS, and that gender did not significantly influence the academic performance of students receiving CRS instruction through the ICT instructional package. Based on the findings, it was recommended among other things that Christian religious studies teachers should use ICT for teaching CRS in secondary school. Ishtiaq Hussain, Qaiser Suleman et.al (June 2017) vol.4 no 1)- The study titled "Effects of information and communication technology (ICT) on students' academic achievement and retention in chemistry at secondary level" involved a random selection of fifty 9th-grade students from Kohsar Public School and College in Latamber Karak. The students were organized into equivalent groups based on their scores from a pretest. To gather data, a pretest-posttest equivalent groups design was utilized. Statistical analysis was performed using SPSS, applying mean, standard deviation, and independent sample t-test. The results of the statistical analysis revealed that information and communication technology has a positive impact on students' academic performance and retention, with ICT proving to be more engaging, effective, and beneficial in the teaching of chemistry compared to traditional teaching methods. OJO, Olanrewaju A. et Al (2017)- volume-4. ISSN 2348-1269)- "Influence of information communication technology facilities on Academic performance of mathematics students in college of education, Nigeria". The study adopted descriptive survey of research design. The study's population comprises all students enrolled in the College of Education at Ikere-Ekiti, Ekiti State, Nigeria. A stratified random sampling method

was employed to select 25 Nigerian mathematics students. In total, 75 NCE mathematics students were included as samples for this research. Three research questions were formulated and examined at a 0.05 level of significance. The tool used for the study was a self-designed questionnaire. The gathered data were analyzed utilizing the chi-square (X<sup>2</sup>) statistical analysis package. The findings indicated that the presence of ICT facilities has an effect on the academic performance of mathematics students at the College of Education in Ikere-Ekiti, Ekiti State, Nigeria. Moreover, the analysis of the collected data also demonstrated that the use of ICT facilities impacts the academic performance of mathematics students in the same institution. Based on the results of the study, conclusions and recommendations were provided. Arzal (arzal m@yohoo.com) - "the impact of information communication and technology on students' academic performance: evidence from INDONESIAN EFL classroom". In this current study, the independent variable was the use of English learning websites as the platform for ICT utilization. The researcher employed a mixed-methods approach combining quasi-experimental design with qualitative interviews. The quantitative data analysis revealed through a t-test that students in the experimental group performed significantly better than those in the control group; however, the differences were not statistically significant. According to the interview results, participants shared their positive experiences with technology, increased motivation for learning English, and a boost in their confidence regarding their language abilities. Keeping in view the above facts the researcher has under taken the present venture to see the impact of ICT on students' academic performance in Cuttack district and to provide some future progress.

#### ➤ *Objective of the Study:* -

The primary objective of this research is to examine the effect of Information and Communication Technology (ICT) on the academic achievement of students in secondary schools located in the Cuttack district of Odisha. Specifically, the study aims to determine whether.

- To study the use of ICT as a Tool in classroom teaching.
- To study the effect of ICT on teaching learning process.
- To compare achievement of the ICT used students and non-used students.

#### ➤ *Hypothesis of the Study:* -

- There is significant difference between ICT used students' academic performance and non-used ICT students' academic performance.
- There is significant difference with ICT as a tool of teaching and learning and traditional method of teaching and learning.

## II. DATA BASE AND METHODOLOGY

In this study, the descriptive research method was identified as the most suitable approach since it effectively analysed the influence of ICT on the academic performance of secondary students in the Cuttack district. Descriptive research is intended to gather relevant and precise data

regarding the current condition of phenomena and, when feasible, to make valid generalizations based on the findings. The participants/target population in this research were secondary school students from the Cuttack district. In this research, the researchers utilized a purposive sampling method to choose participants from the population. Based on the availability of samples in the Cuttack district of Odisha, a total of 40 ninth-grade students were chosen as the study sample from to schools namely: Shree Shree Megheswar High School, Chanchoo, Sadhu Sundar Vidyaputha, Nakhara.. To obtain authentic, genuine, and accurate data, the researcher opted to use a questionnaire as the data collection instrument for this study. Initially, the investigator engaged with the head of the institution and established a rapport with them in order to gather reliable data.

### III. RESULTS AND DISCUSSION

Data collected from the field becomes meaningful only when these are analyzed appropriately and interpreted in the context of research. This portion of the study presents the objective wise result of data analysis.

#### ➤ Effectiveness of the Traditional/Conventional Method of Teaching English Subject. (Pre-Test)

The achievement scores 9<sup>th</sup> class students gained through the traditional method are plotted on the form of frequency distribution, which is represented by histogram.

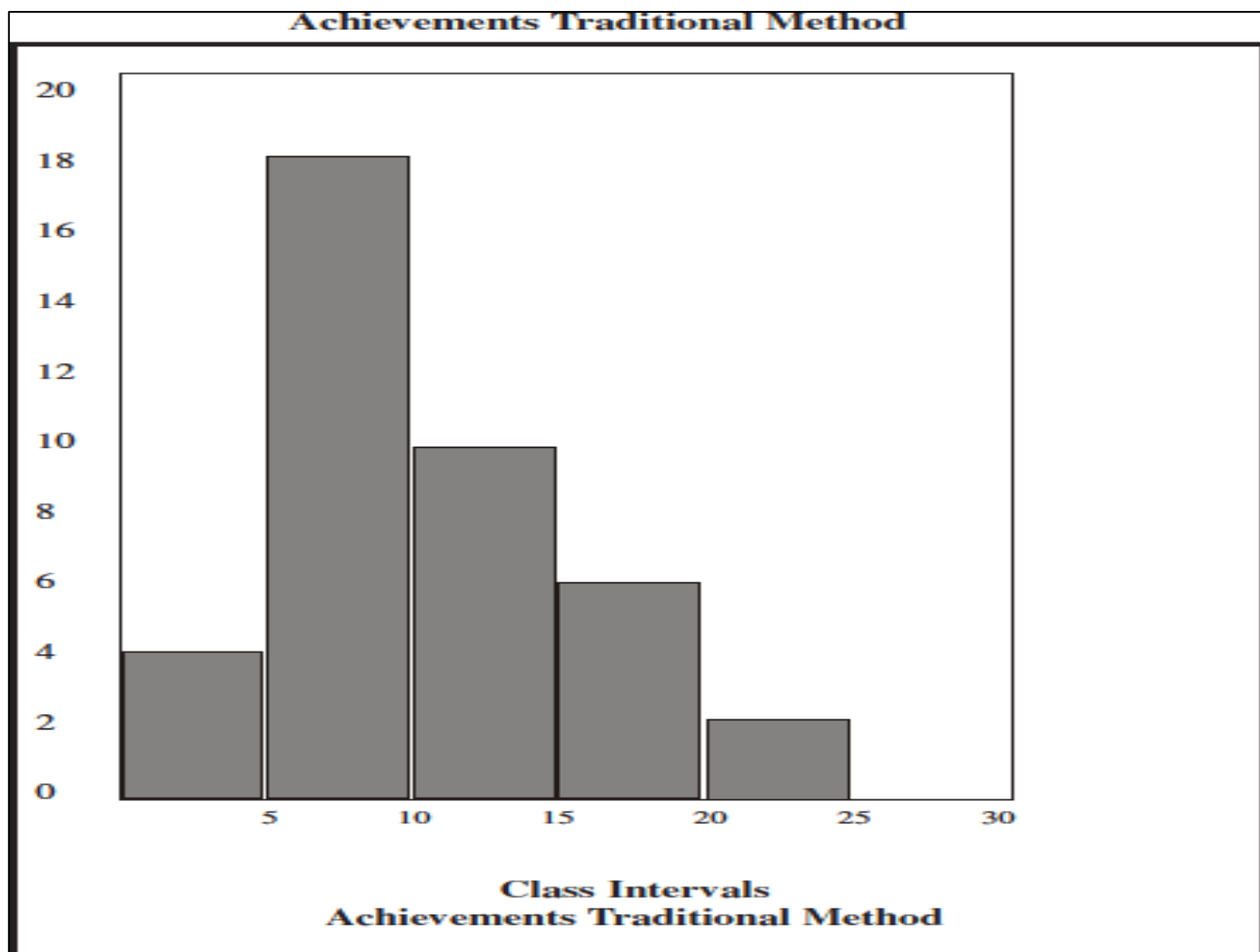


Fig 1 Achievement- Plot for Traditional Method of Teaching Used for English Subject.

Figure 1 shows that 0-5 class interval student scored – 4, 5-10 class interval student scored – 18, 10-15 class interval student scored – 10, 15-20 class interval student scored – 6, 20-25 class interval student scored – 2, 25-30 class interval student scored – 0.

In the class interval 25-30. The highest no of students i.e. 18 scored in the class interval 5-10 and the lowest no of students i.e. 0 scored in the class interval 25-30, since the no.

of scores in the class interval 10-25 and 5-10 are 18 and 18 respectively. It is concluded that the conventional method of aware of ICT.

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➤ *Effectiveness of ICT Based Teaching Method. (Post- Test)*

The achievement score of 9<sup>th</sup> class students gained through the computer/ICT impact our study form of frequency distribution, which is represented by histogram.

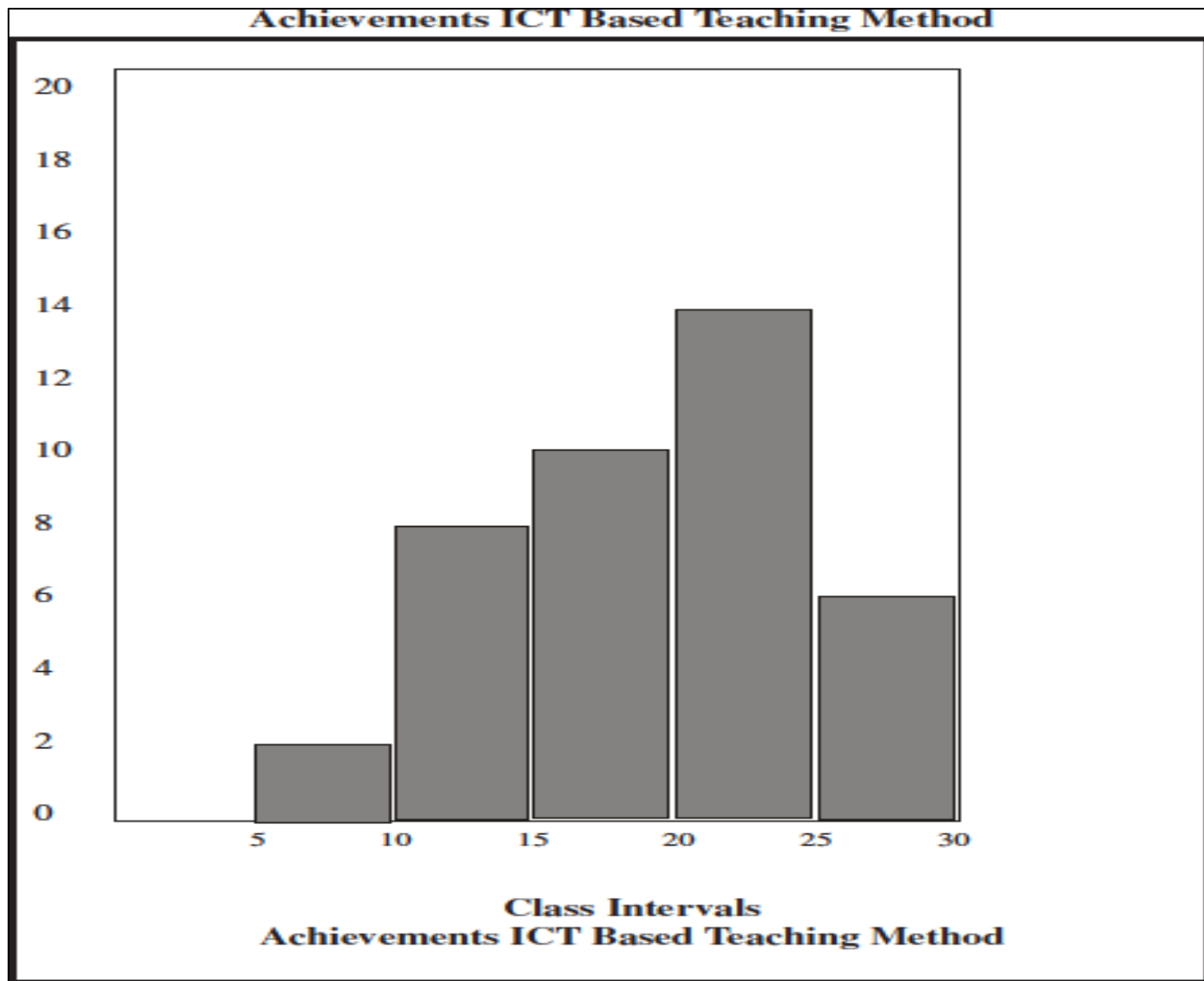


Fig 2 Achievement – ICT Based Method of Teaching for English Subject

Figure 2 shows that 0-5 class interval student scored – 0  
5-10 class interval student scored – 2

10-15 class interval student scored – 8  
15-20 class interval student scored – 10  
20-25 class interval student scored – 14  
25-30 class interval student scored – 6

The highest no. of students i.e. 14 scored in the class interval 20-25 and the lowest no of students i.e. 0 scored in the class interval 0-5, which is quite good. Since the no. of scores in the class interval 10-30 and 5-10 are increased to 38 and decreased to 2 respectively, it is concluded that the ICT based teaching pattern of the students in computer impact the study is effective.

➤ *Comparative Efficacy of the Conventional Method and ICT Based Teaching Method: -*

The comparative effectiveness of conventional method and ICT based method of teaching English subject is studied from their respective distribution (figure 4.1 and 4.2). The highest score i.e. 18 in the class interval of 25-30 of the traditional method is 0 which is much negligible in comparison to the ICT based teaching, where it is 6. The no. of score of the lowest class interval 0- 5 of the conventional method is 2 which is even greater than that of ICT based teaching. In ICT based method, the no of scorers in the class interval 10-30 and 5-10 are 38 and 1 respectively and was found to be much more effective than that of the conventional method, which is 18 and 18 respectively. Thus more no. Of students were benefited out of the ICT based teaching pattern

of learning of English subject. Hence it is inferred that ICT based of teaching and learning English subject was much more superior to the conventional method. The descriptive statistics for the 2 achievement test scores of the group is presented in table 1.

Table 1 Descriptive Statistical for Achievement.

Method of Intervention	N	Mean	Std. deviation	Std. Error mean
Traditional Method	40	10.5	5.47	0.86
ICT based Teaching	40	19.25	5.80	0.91

The mean achievement score for the traditional method and the ICT based teaching method is 10.5 with standard deviation of 5.47 and 19.25 with standard deviation of 5.80 respectively. The significant difference between the two means were examined using t-test.

#### ➤ Significance of Mean Difference in Achievement: -

As the researcher had formulated a directional hypothesis than, “The performance of 9<sup>th</sup> class students in English subject achievement test will be better through the introduction of ICT based teaching than through the traditional method”, The one tail test was used. Therefore 39 df the .05 level is assumed from .10 column ( $p/2=.05$ ) to be 1.68 and the .01 level from the .02 column ( $p/2=.01$ ) is 2.42. The present t-value of 1.68 is much larger than the .01 level of 2.42. Therefore, the difference between the mean achievement score of students. Students taught through ICT based teaching and the traditional method is significant at .01 level. The t-value signifies a great difference in the mean scores of students taught through the two methods. Therefore, the directional hypothesis is supported. Thus, it is evident that the ICT based teaching method of English subject was more effective to the traditional method.

## IV. FINDINGS

- Most of the students were aware by using ICT.
- The most frequently girls' students were not used ICT.
- Most of the student agreed with in my line that computers are highly useful for their teaching learning process.
- Most of the students were also agree that computer impact their study.
- Most of the students used equipment comes under the ICT in their home as well as in their day-to-day life. Like-mobile phone.
- ICT also helps in students self-learning.
- Some of the students also gave negative opinion about the Impact of ICT on academic performance as well as their personal life.
- ICT based method of teaching may be helpful to the students those who are not regular in class. It helps for virtual class.

## V. SUGGESTIONS

- Only 9<sup>th</sup> class students were taken in the current study. The other/higher students may be taken for further study.
- The present study is limited to Cuttack district; other area may be taken for conducting this type of research.
- Further studies may be undertaken in another district.

#### ➤ Interpretation of the Data: -

- Descriptive Statistical for Achievement.

- Higher secondary students and their teachers may be involved in the undertaking.
- Further comparative study may be under taken on rural and urban area students.
- This type of research can also conduct in regular and distance learning courses.
- This study was being conducted on English subject only of 9<sup>th</sup> class students of further studies another subject with taken.

## VI. EDUCATIONAL IMPLICATION

The current research on the influence of information and communication technology on the academic success of secondary school students yielded numerous findings. The students' perspectives indicate that ICT has both beneficial and detrimental effects. To enhance the relevance of ICT for educational purposes, several recommendations can be made. These include the following.

- Consciousness should be created among the students regarding the utility of ICT an academic field.
- Awareness should be created among the teachers/parents in regard to the utility of ICT on academic field.
- ICT has immense importance for virtual classroom teaching for the student of remote/distance areas.
- ICT based teaching is more interesting than traditional based teaching.

## VII. CONCLUSION

Ultimately, this study sought to explore how ICT affects students' academic achievements. Based on the findings, it can be concluded that information and communication technology significantly influences students and their ability to access information. The effects were noted to be pertinent for senior students in ICT, offering solutions to specific curriculum challenges. ICT enhances both the quality and quantity of educational experiences.

## REFERENCES

- [1]. Abdulla: Y AI – Hawaj, wajeel Elali and twizzell, FH(Ed) 2008– Higher Education in the 21<sup>st</sup> issues and challenges Taylor and Francis group, Landon, UK.
- [2]. Adeyemi T.O. (2011)- Impact on information and communication technology (ICT) on the effective management of universities in south west Nigeria.
- [3]. Aristovnik Aleksander(vol.11(2012)- “The impact of ICT on educational performance and its efficiency in

- selected EU and OECD countries: A non-parametric analysis”.
- [4]. Arzal(arzalm@yahoo.com)- “the impact of information communication and technology on students’ academic performance: evidence from INDONESIAN EFL classroom”.
- [5]. Boyd Danielle (2012)- “The impact of information communication technology on student achievement on university of British Columbia”.
- [6]. Desai, Beena V. (2004)- “Comparative study of the efficiency of teaching through and traditional method and the multimedia approach in the subject of home science” <https://nairaproject.com/projects->“The effect of information communication technology (ICT) on students’ academic performance on mathematics in selected secondary schools in kosofe local Government area of Lagos State”.
- [7]. HussainIshtiaq, Qaiser Sulemanet.al (June2017) vol.4no1)- “Effects of information and communication technology (ICT) on students’ academic achievement and retention in chemistry at secondary level”.
- [8]. IC Mbaeze, elochukwu ukwandu et al. (2010)- “the influence of information and communication technologies on students’ academic performance”.
- [9]. Intel teach Essar fiak (Ac. Guest 2005)- “The role of ICT in enhancing education in developing countries in six schools in Chile, India, and Turkey”
- [10]. IKpeama, M.N.(MRS)2015)- “Impact of ICT on student academic performance case of selected secondary schools in Enugu”.
- [11]. Ikwuka, o.I, Adigwe Joseph Eluemunor Henry (vol.4(2017) (ISSN (online)2348-7968, [www.Ijiset.com](http://www.Ijiset.com))- “Effect of ICT on secondary school students’ academic performance in Christian religious studies in OSHIMILI north local Government area”.
- [12]. Jonathan.E. ([contact@freeprojecttopic.com](mailto:contact@freeprojecttopic.com)/3566) ([info@freeprojecttopic.com](mailto:info@freeprojecttopic.com))- “Impact of ICT usage on the student academic performance”.
- [13]. Khan Muhammad saqib, kham infanullach et.al (vol.5.no.1. (2015)- the impact of ICT on the students’ performance: A review of access to information”.
- [14]. Leuven et.al. (2004)- Comparing three methods of online on campus and hybrid methods of teaching.
- [15]. Nabahetal\, (2009): -conducted study on “The Effect of Computer Assisted Language Learning in Teaching English Grammar on the Achievement of Secondary Students in Jordan”.
- [16]. Obinna Otuuo. (2013) “impact of information communication technology (ICT) on secondary school education in ANAMBRA state”.
- [17]. OJO, Olanrewaju A. et.al (2017)- volume-4. ISSN2348-1269) "Influence of information communication technology facilities on Academic performance of mathematics students in college of education, Nigeria".
- [18]. Okwoda NicholasE. (2016), volume-IV, ISSN:2320-3145- "Information and communication technology (ICT) and student academic performance in Biology in senior secondary school in Rivers State".
- [19]. Onyia,MaryN. (2013The impact of ICT on University Students academic Studies”.
- [20]. Opera geoferey (2010)- “Effects of information and communication technology on students learning: A case of ULU University”.
- [21]. Khedekar Sandhyaand magre Sunita (2012): - Conducted study on A Study of Information and Communication Technology Awareness and Academic Performance of Secondary Students.
- [22]. Srivastava Sangeeta, Naveen (2014Impact of ICT on student academic performance in secondary school.
- [23]. ThomasJohnson(2014)-"The effects of information and communication technology on student achievement".
- [24]. Youssef and Dahmani (2010): -Conducted study on “The Impact of ICT’s On Students Performance in Higher Education: Direct Effects, Indirect Effects and Organizational Change”.