

# The Effects of Computer Network in an Educational Institution

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**Abstract:-** Communication technologies improve teaching and learning processes. Computer network has positive impact on teachers, students and administrators for exchange of views and effective communications. This study presents an interpretive case study of assessing the effects of using computer network at Regentropfen College of Applied Sciences, Kansoe in the Bongo District of Upper East Region of Ghana. In all, sixty respondents made of twenty (20) Teaching and Administrative staff and forty (40) students were randomly selected for the study.

The researcher collected data for this study by the use of questionnaire and interview and analysed it with the help of Microsoft Excel Application. Results of these analysis showed that students were interested to use the network in the College. Regardless of the high initial cost of setting up of the network it was observed that it has positive effects on teaching and learning processes. It was identified that the lecturers and administrators feel comfortable with the Local Area Network in the College. The network infrastructure was robust but there were challenges with constant Internet connectivity.

However, the study recommended that management and other stakeholders of the College should put the necessary measures for a reliable and efficient internet connectivity to link the College's network infrastructure to the outside world to facilitate quick and smooth transmission of data.

**Keywords:-** Network, Internet, Communicate, Equipment.

## I. INTRODUCTION

The term computer network comes to mind whenever various technological devices are linked together for the purpose of processing and distribution of views and opinions among the group of people with the network. . Nowadays, information and communication technology affects the success of an institution or enterprise through sharing of essential elements of good practices. The use of computer network will help the institution or any organisation to upgrade and update itself to the new trends and in effect facilitate quicker dissemination of information all time round. While managers today are able to use the newest applications, many departments still do not communicate and much needed information cannot be readily accessed.

Due to Computer networks possibilities which makes communication faster than other facilities it is convenient for every department or institution to accomplish most its aims and objectives as knowledge and applications could be tapped from different sources around the globe.

The benefits of computer network lies in the possibility for the users to access remote programmes from the same organization or from other public sources. In view of these, great information and communication possibilities computer network is likely to increase learning rate thereby improving the performance of the institution involved.

### A. Statement of the problem

The effects of computer network with regards to the objectives and aims of the institution or organization is to facilitate free flow of information and other valuable resources for development. Computer network enables the people to access the rich knowledge and skills from different angles for the betterment of the institution or organization. The study of this nature therefore seeks to find out the effects and the need for computer network in educational institution.

### B. Purpose of the study

With the increasing emphasis on the requirement for students to become proficient in the use of information communication technology the study seeks to identify and explore the effects of computer network in an educational institution in Regentropfen College of Applied Sciences Kansoe in the Bongo District of Upper East Region of Ghana.

The study also sought to find out why is it necessary to have computer network in an educational institution and difficulties in setting up network infrastructure by the College under study.

### C. Research questions.

The following are the research questions to be addressed:

- What are the effects of computer network in an educational institution?
- What are the difficulties in setting up computer network in an educational institution?
- Why there is the need for computer network in an institution?

### D. Literature Review.

In recent years, networking and collaboration have become increasingly popular in education. Local and national initiatives have stimulated a variety of cooperative arrangements, from groups of schools that have volunteered to work together, to groups that have been induced to do so in the context of incentives, to others that have been subject to direct external pressure to collaborate (West & Ainscow, 2006). These many initiatives have not typically been based on a clear understanding and definition of what is meant by networking in education, however. One of the few definitions found in education was coined by Hadfield, Jopling, Noden, O'Leary, and Stoll (2006) on behalf of the

National College for School Leadership (NCSL) in England. A network is defined by them as: “groups or systems of interconnected people and organisations (including schools) whose aims and purposes include the improvement of learning and aspects of well-being known to affect learning” (Hadfield et al., 2006, p. 5).

The first dimension on which networks can be distinguished is that of goals and activities. In contrast to views of networking as being necessarily concerned with learning and school improvement, other goals are both theoretically possible and present in the education system. For example, a renewed emphasis on full-service schools and multi-agency working has in many countries led to schools collaborating with each other and with external agencies to be able to provide a full service to pupils, addressing the social, health, and psychological needs of pupils in ways that would not be possible for individual schools (Sailor, 2002). Schools can also network, in the way businesses often do, to save material and staff costs and to apply for funding through joint bids (Nooteboom, 2004) or for the provision of more effective and scalable Continuing Professional Development (CPD) activities (Hadfield, 2005).

In educational practice, network goals as they currently appear to exist can be broadly defined as being about:

- School improvement;
- Broadening opportunities (including networking with non-school agencies such as social services or business);
- Resource sharing.

As well as having different goals, school networks can be distinguished in terms of the timescale of activities undertaken. Activities undertaken by networks are obviously highly varied. A related theory on the importance of networking focuses on the value of networking and collaboration in creating social capital. Social capital contains three main elements:

- Resources embedded in a social context;
- That are accessed or mobilized;
- In purposive action (Lin, 1999, p. 30).

The value of networking in this perspective is seen as lying in its ability to harness resources held by other actors and increase the flow of information in a network.

Furthermore, a network can exert more influence on its social and political surroundings than individual actors (Lin, 1999). Social capital can also help spread innovation, which, according to Hargreaves (2004), is best done through bottom-up networks that can both quickly link schools to innovators and may themselves lead to innovations that are more open to change and challenge and less likely to ossify than top-down strategies.

Knowledge lies in different minds, both individual and collective, and therefore networks are needed to increase effectiveness.

The value of networking lies in spanning “structural holes” where information or skills are lacking (Burt, 1992). This makes collaboration a potentially fruitful strategy for all actors involved in a network, as each may in theory be able to span structural holes, something which becomes more likely when a network consists of several actors. In this view, networking can be unsuccessful where there is too strong an imbalance between actors in terms of what information/skills they possess or where structural ties can imprison actors in negative behaviour patterns (Borgatti & Foster, 2003).

There is evidence in a number of studies that networked learning can increase school capacity (Chapman & Allen, 2005), can help forge relationships across previously isolated schools (Harris, Chapman, Muijs, Russ, & Stoll, 2006), and can therefore be an effective means of sharing good practice (Datnow et al., 2003; Harris et al., 2006).

## II. METHODOLOGY

This chapter look at the effects and usage of computer network in an educational institutions in with regards to teaching and learning. The researcher employed quantitative method in gathering data for the study. Interview was conducted to collect the opinions of the people who use the network in the college.

### A. Research instrument

Research questionnaire was used as the main data-gathering instrument for this study. The questionnaire was grouped into two main sections: a profile and the main survey questionnaire. The profile is made up of socio-demographic characteristics of the respondents such as age, gender, civil status, the number of hours they used the network in their day to day activities in the college. The researcher used interview guide to explore the perceptions of teachers on usability and availability of computer network tools. The questionnaire for the lecturers and the students contains fifteen questions and four choices were provided for every question or statement.

Also, the researcher used the quantitative approach with Microsoft Excel Application for data interpretation.

### B. Sample and Sampling Procedure

In order to give all the members of the sampled population equal chance of becoming a research participant simple random sampling was adopted. The sample for this project comprised forty (40) students who were selected amongst the target population of eighty (80) students from the College and twenty (20) Teaching and Non-Teaching staffs from the institution. Interview was conducted to seek the opinions of some of the staff members on the topic for the study.

## III. RESULTS AND DISCUSSION

This chapter covers the analysis of the data and the presentation of findings of the study. The analysis was done

using the Microsoft Excel 2010 application and for the purpose of clarity, tables were used to depict the results.

*A. Background Information on the Study*

The data collected were analyzed along the lines of the effects and usage of computer network at Regentopfen College of Applied Sciences, Kansoe in the Upper East Region of Ghana.

*B. Demographic Information*

The characteristics of respondents such as age, sex, computer network usage, access to the College’s network and others were analysed. The category of respondents used for the study is analysed in Table 1.

Category	Frequency	Percentage
Teachers/Staff	20	33.3
Students	40	66.7
Total	60	100

Table 1. Category of Respondents

Source: Field data, 2018.

The information analysed in Table 1 shows that 20 (33.3%) of the respondents for the study were teachers while 40 (66.7%) were students. The total number therefore stood at 60 representing 100%.

Ages	Frequency	Percentages (%)
Below 20-30 years	40	67.7
30-40 years	5	8.3
Above 40 years	15	25
Total	60	100

Table 2. Age Distribution of Teachers and Students

Source: Field data, 2018.

From the data collected, Table 3 shows that 67.7% of the respondents were below 30 years. Fifteen (15) respondents representing 25.0% were age above 40 years while five (5) representing 8.3% were between 30 to 40 years. It was realized that the respondents are at their youthful age to be in better position to acquire the necessary knowledge and skills in ICT through the use of computer network.

It is important to establish whether gender plays any significant role in accessing the effects and usage of computer network in the College.

The Table 3 below shows the breakdown of gender of the respondents.

Gender	Frequency	Percentage
Male	40	66.7
Female	20	33.3
Total	60	100

Table 3: Gender of Respondents

Source: Field data, 2018.

From Table 4, 40 respondents representing 66.7% were male while 20 (33.3%) were female. It can thus be said that male respondents outnumbered the female respondents in this study.

The use of the computer network and the internet helps teachers to acquire more knowledge and information to impart onto their students. Below is the distribution of respondent teachers who have access to the internet in their various homes.

Internet Access	Yes	No
Students	6(60.0%)	4(40.0%)
Teachers	3(30.0%)	7(70.0%)

Table 4. Internet Access at Home by Teachers and Students

Source: Field data, 2018

The information tabulated in Table 4 indicates that 6 representing 60% of the students had access to internet in their various homes. Only 4 of the students representing 40% had no access to internet in their homes. On the part of the teachers 3 (30%) had internet access at home while 7(70%) of teachers had no internet access. The world is now considered as a “Global village” with internet facilities since volume of information could be accessed from all corners of the globe with ease. When teachers are well equipped with the modern technologies they will be in a better position to impact the necessary skills and knowledge to their students as well.

C. Analysis of the Main Data

In this section, the findings that emanated from the study in terms of effects of computer network usage in the institutions, why the need for computer network and when and where both teachers and students are to use the network in their day to day activities are presented.

Research Question One

D. What are the effects of computer network in an educational institution?

It has become very clear that computer technology is taking over from the traditional way of impacting knowledge and skills, therefore involvement of the administrators, stakeholders and other philanthropies could be encourage to support it implementation in our educational system. It is in this direction that the researcher sought to examine the effects of computer network available in our educational institutions. The data collected in this regard is presented in Table 5.

Table 5, indicates the response of the effects of computer network in an educational institutions.

Question	Agree	Disagree	Not Sure
computer network helps both teachers and staff in teaching and learning	50(83.3%)	3(5%)	7(11.7%)
Computer networking enables both teachers and students to share resources	54(90%)	2(3.3%)	4(6.7%)
Network improves the performance of the institution	40(66.7%)	8(10%)	12(20%)
Network promotes effective communication	58(96.7%)	2(3.3%)	0(00%)
Network broadens the opportunities of the institutions.	31(51.7%)	9(15%)	20(33.3%)

Table 5. Effects of Computer Network in an Institution.

Source: Field data 2018

The data in Table 5 shows that 50 respondents representing 83.3% agree that computer network helps both teachers and students in teaching and learning while 3 representing 5% disagree to the assertion and 7 respondents representing 11.7% were not sure. On the other hand, 54 respondents representing 90% agree that computer network enables sharing of resources. Two (2) respondents representing 3.3% disagree while 4 respondents representing 6.7% were not sure. Also, 40 of the respondents representing 66.7% agree that network improves performance in our educational institutions and 8 respondents representing 10% disagree. A network is defined as: “groups or systems of

interconnected people and organisations (including schools) whose aims and purposes include the improvement of learning and aspects of well-being known to affect learning”(Hadfield et al., 2006, p. 5).

Twelve (12) respondents which represent 12% were not sure that computer network improves performance.

Moreover, 58 respondents representing 96.7% agree that computer network promotes communication while 2 representing 3.3% disagree. As Howard Clark defined communications networks as (interaction) “of people, dispersed over geographically separate sites, (equipped)

with appropriate communications technology". Thirty-one (31) respondents representing 51.7% agree that computer network broadens the opportunities of an institution while 9 respondents representing 15% disagree. Twenty (20) respondents representing 33.3% were not sure.

#### Research Question Two

E. *What are the difficulties in setting up computer network in an educational institution?*

QUESTION	Agree	Disagree	Not Sure
It is difficult to get the internet service providers	30(50%)	5(8.3%)	25(41.7%)
Initial cost of Setting up a dedicated computer network in an institution is very expensive	59(98.3%)	0(00%)	1(1.7%)
Trained or specialist is needed as network administrator to man the computer network	60(100%)	0(00%)	0(00%)
Managing and maintenance of the network is very costly	45(75%)	5(8.3%)	10(16.7%)
Tools and equipment to setup computer network is very costly	52(86.7%)	0(00%)	8(13.3%)

Table 6. Difficulties in Setting up a Computer Network.

Source: Field data 2018

The information in Table 6, 30 respondents representing 50% agree that it is difficult to get internet service providers while 5 of the respondents representing 8.3% disagree. Twenty-five (25) present representing 41.7% of the respondents were not sure. In the same vein, 59 respondents representing 98.3% agree that initial cost of setting up a dedicated computer network is very expensive while 1 of the respondent representing 1.7% was not sure. Besides, all the sixty (60) respondents representing 100% agree that trained or specialist is needed to administer the computer network. The respondents were of the view that computer network comes with its own challenges so there is the need to get the right personnel to monitor, maintain and control the day to day activities of the network.

The initial cost of setting up the infrastructure for an effective and reliable computer network is very high. The Table 6 below displays the response of the difficulties in setting up a computer network in an institution.

Also, 52 of the respondents representing 86.7% agree that tools and equipment to set up a computer network is very costly. Eight (8) respondents representing 13.3% were not sure.

#### Research Question Three

F. *Why there is the need for computer network in an institution?*

Knowledge and skills could be shared by the use of computer network. Different people with different ideas could be hooked together to share resources with ease. Table 7 below displays the response on why there is the need for computer network in an institution.

QUESTION	Agree	Disagree	Not Sure
To make it very easy to provide internet services	44(73.3%)	8(13.3%)	8(13.3%)
Teachers and students have access to the network outside campus	30(50%)	12(20%)	18(30%)
The network is used by the teachers and students daily.	20(33.3%)	22(36.7%)	18(30%)
To enable teachers, students and management share files and programmes.	52(86.7%)	5(8.3%)	3(5%)

Table 7. Why the need for Computer Network in an Institution.

Source: Field data 2018

Data in Table 7 clearly shows that 44 of the respondents representing 73.3% agree that networking makes it easy to provide internet. It is noted that there is

split decision as 8 respondents representing 13.3% disagree while the other 8 (13.3%) were not sure.



On the other hand, 30 of the respondents representing 50% agree that both teachers and students have access to the network outside campus while 12 representing 20% disagree. Eighteen (18) respondents representing 30% were not sure. The analysis further shows that 22(36.7%) of the respondents disagree that both teachers and students have access to the network outside campus while 20(33.3%) also agree and 18 respondents representing 30% were not sure.

Moreover, 52 of the respondents representing 86.7% agree that teachers, management and students share files and programmes on the network. Only 5(8.3%) disagree to that assertion and 3(5%) were not sure. The value of networking lies in spanning “structural holes” where information or skills are lacking (Burt, 1992).

#### IV. INTERVIEW

The researcher used interview to gather information from some of the teachers on usability and availability of computer network in the College. The interviewees were selected randomly and conducted at different times and the following were the results obtained.

All the respondents interviewed indicated that the College has well-structured network infrastructure which is connected to the internet. It was observed that all the various lecture halls, computer laboratory and library are all networked with the modern devices.

Moreover, majority of the interviewee agree that computer network on campus has helped them to share files and programmes very quick and timely. It was also noted that other devices like printer on the network could be shared.

In addition, few of the interviewee reported that little did they know about how the network is being repaired or maintained because such things are technical. There are different types of networks with regards to their usage and installation. This implies that the nature of repairs and maintenance differs from network to network. The tools and equipment involved will determine the nature of repairs and maintenance required. According to the network administrator, there has not been much repairs and maintenance on the physical infrastructure yet but sometimes the software used to run, control and monitor the network are changed.

Also the researcher observed that all the staff and students have network user account to enable them login into the campus network. The students are to renew their accounts at the beginning of every semester as the user authentication expires at the end of every semester.

Besides, almost all the interviewees agreed to the fact that computer network helps in communication and improve the performance of the institution but the initial cost of setting it up is very high. On the other hand, some complain about the slow nature of the internet services and this was attributed to the distance between the College and the

Internet Service Provider (ISP). It was observed that the network on campus is an Intranet and covers a limited area and WLAN is being employed to make room for both wireless devices and cable ones to have access to the network.

#### V. CONCLUSIONS

It was observed from the study that network infrastructure exist in the College and it is in use by both staff and students. The College has access to internet facilities and MTN Ghana is the Internet Service Provider (ISP). It was evident that all the lecture Halls, Offices, Computer Laboratory and the Library are all networked.

However, the College employed Wireless-Local Area Network (WLAN) to make access to the internet by both wireless and cable devices.

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