Analysis of Factors Responsible for Low Patronage of Fixed Line Broadband Internet Access in Ghana

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ABSTRACT

The internet has become an extremely important modern day technology for business and made a lot of activities very easy. It is used for almost all purposes, even with important issues such as in education and government organizations. In view of these benefits, various technologies have been developed to connect users to the internet. Some of these technologies include dial up, ISDN, DSL, satellite and mobile broadband.

The purpose of this paper is to find the causes of low patronage of fixed line broadband internet access (DSL using landline) among households in Ghana. The paper employs qualitative research design whilst the survey method (both interview and questionnaire) was applied as the data collection methodology.

The main findings were that most educated people in Ghana are computer and internet literates and perceive the internet as important. It was also found that many people are of the view that fixed line broadband internet access is expensive and slow. More importantly, most people are ignorant about fixed line broadband internet access and do not know the advantages that fixed line broadband internet access has over its competitors. Finally, it was discovered that fixed line broadband connection is absent in most communities and where it exists, most people complain of lack of money to subscribe to the service.

Based on the findings, the paper concludes that low patronage of fixed line broadband internet access is attributable to ignorance about fixed line broadband internet access, lack of knowledge of completive advantages of fixed line broadband internet access, low income among households, lack of fixed line broadband connections in most residential areas, high cost of subscribing to fixed line broadband internet access and slow pace of downloading and uploading information using fixed line broadband internet access.

The paper ends by recommending, among other things, that the general public be sensitized on the use of fixed line broadband connections, internet users must be educated on the advantages of fixed line broadband internet access through the mass media, bandwidth speed must be improved, a study be carried out to find out if price reduction of fixed line broadband internet access will make ISPs financially viable and consequently lead to increase in demand services and finally, a study be conducted on the financial viability of expansion of fixed line broadband connections to more localities.

Keywords: fixed line broadband, Internet service providers (ISPs), internet users and VODAFONE Ghana.

INTRODUCTION

The Internet has revolutionized the lives of humans in many ways and made this world a global village. The internet has also made a lot of activities very easy and it is used for almost all purposes, even with important issues such as in education and government organizations. The internet has made a huge impact on society, that people cannot do certain activities without it. It is now so popular that it has touched every aspect of our lives, changing how we keep in touch, share information, conduct business and even earn an income.

For example, we can now communicate with each other almost instantly anywhere in the world using instant messaging programs. Now we don't have to spend hours looking for information in our libraries. The information is available to us anytime, with just one click of the mouse. Instant access to information has really empowered all of us. Businesses now use the Internet to communicate with their customers. From the consumers' point of view, they can now easily compare prices and features of a product before making decision to purchase it. Banking transactions can be done at any time on the internet.

In view of these numerous benefits of the internet, various technologies have been developed to connect users to the internet. Some of these technologies or methods include dial up connection, ISDN, cable TV connection, digital subscriber line (DSL), satellite connection and mobile broadband connection.

Among these methods of connecting to the internet, Ghana is currently using the DSL, satellite connection, WIMAX, digital video broadcast, ISDN, and mobile broadband connection (using 3G technology). Consumers that subscribe to mobile broadband connection purchase USB equipment (popularly known as broadband modem) to connect their PC or laptop to the Internet via cell phone towers. According to Wikipedia, 3G or 3rd Generation is a generation of standards for mobile phones and mobile telecommunications services fulfilling specifications by the International Telecommunication Union. 3G application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment. 3G systems allow simultaneous use of speech and data services. The 3G standard used in Ghana is W-CDMA.

The most popular method of connecting to the internet among corporate institutions and internet cafes in Ghana is the DSL popularly known as fixed line broadband internet access. Hence, fixed line broadband internet access in this report refers to DSL internet access method. However, fixed line broadband internet access is any high data rate connection to the internet through solid medium, either metal wire or optical fibre. DSL (Digital Subscriber Line) is a family of technologies that provides digital data transmission over the wires of a local telephone network. In telecommunications marketing, the term Digital Subscriber Line is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed technical variety of DSL. DSL service is delivered simultaneously with regular telephone on the same telephone line. This is possible because DSL uses a higher frequency. These frequency bands are subsequently separated by filtering.

DSL was pioneered in Ghana by Internet Ghana, an ISP, and by 2003 Internet Ghana was supporting approximately 275 subscribers on ADSL over existing wired phone lines. These customers use a splitter to allow them to access both voice and data over the same line. The popularity of this method is found in companies, institutions, small and medium enterprises and commercial internet cafés. Most internet users in Ghana perceive the Internet as a means of communicating with friends, relatives and organizations outside the country. Few users use the Internet for research and other educational purposes. The patronage of this DSL is low among households.

According to Wikipedia, the free encyclopedia, although various minimum bandwidths have been used in definitions of broadband, ranging from 64 Kbit/s up to 4.0 Mbit/shttp://en.wikipedia.org/wiki/Broadband_Internet_access_-_cite_note-Birth_of_Broadband-0, the 2006 OECD (Organization for Economic Co-operation and Development) report is typical, by defining broadband as having download data transfer rates equal to or faster than 256 Kbit/s, while the United States (US) Federal Communications Commission (FCC) as of 2010, defines "Basic Broadband" as data transmission speeds of at least 4 megabits per second (Mbps), or 4,000,000 bits per second, downstream (from the Internet to the user's computer) and 1 Mbit/s upstream (from the user's computer to the Internet). Currently, the most popular technology used for fixed line broadband internet access in Ghana is DSL.

DSL is a new broadband communication technology that allows high-speed access to the internet and remote networks using the dial up lines which are already present in the homes and offices. (Source: http://www.internetghana.com/dsl.htm). DSL is superior to analog modems popularly known as land line or dial up.

Internet Ghana, an ISP, after its establishment in Ghana in June 1996, pioneered the use of ADSL and by 2003 was supporting approximately 275 subscribers on ADSL over existing wired phone lines. (Source: http://www.internetghana.com/ceo_in_sa.htm).

In 2004, Ghana Telecom (now Vodafone) also introduced ADSL services offering users internet access at higher speeds. The service was branded Broadband 4U. Potential users and subscribers would pay 195 dollars, 295 dollars and 395 dollars for the broadband4U residential, school, and businesses respectively as installation fees. All charges are payable in cedis at prevailing exchange rate.

(Source: http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=62158).

In the recent internet performance ranking results conducted by speedtest.net - an independent global internet connectivity host, Vodafone Ghana's broadband is number 1 in Ghana for download and upload speeds. What makes the news even more exciting is the fact that Ghana is now number 1 in Africa. Ghana is now 12th in the world for upload speed and 41st in the world for download speed. Vodafone broadband is delivered using ADSL, a tested and proven technology which enables your landline not only to make and receive voice calls but also to access the internet.

(Source: http://www.vodafone.com.gh/Personal/Internet/Fixed-Broadband.aspx)

In spite of this remarkable success in fixed line broadband internet access in Ghana, patronage of the service is low among households. However, it is the most popular method of connecting to the internet among cafés and organizations in Ghana. This assertion of low patronage is buttressed by ITU ICT statistics news log-fixed line report on Wednesday, March 11 2009. According to the report, Dr. Kwabena Duffuor, Ghana's minister of finance and economic planning said the total fixed line in Ghana dropped from 389,483 in 2008 to 279,324 in 2009. He made this statement when he presented the government's budget statement to parliament. Dr. Duffuor attributed the fall to the Removal of Dormant Subscribers from Ghana telecom's fixed line network.

(Source: http://www.itu.int/ITU-D/ict/newslog/CategoryView,category,Fixed%2Bline.aspx).

It was against this backdrop that we decided to find out why household internet users are not patronizing fixed line broadband internet access, despite its numerous advantages over other methods (such as satellite and mobile broadband) of accessing the internet.

The main objective of this paper is to find the causes of low patronage of fixed line broadband internet access among households in Ghana. To achieve these objective, the paper seeks to find answers to the following research questions:

- Are most educated Ghanaians computer literate?

- Do most educated Ghanaians know how to access the internet?
- Why most educated Ghanaians do not have internet access at home?
- How do educated Ghanaians perceive the value of the internet?
- Do most educated Ghanaians know what fixed line broadband internet access is?
- Do most educated Ghanaians know the advantages of fixed line broadband internet access over other methods (such as satellite, mobile broadband etc.) of connecting to the internet?
- Is fixed-line broadband internet connection available at most residential areas?
- Is fixed line broadband internet access affordable to an average income level Ghanaian?
- Do internet users and subscribers face problems with fixed line broadband internet access?

The paper will be significant because the findings will enable us to come out with very useful recommendations that will enable ISPs take measures to improve their service and attract more household subscribers. It will also provide information to the Ministry of Communications on the level of usage of information technology tools in the country.

The potential limitation of this paper may be connected to our inability to reach out to all ISPs because they are scattered in the major cities. Some ISPs felt reluctant to respond to questionnaires and interviews. Their unwillingness to respond to questionnaires was due to the fear that information gathered might be disclosed to competitors in the industry.

2 METHODOLOGY

This section describes the methodology employed throughout the entire paper. It describes and justifies research design, the population and sampling technique, research instruments and validity and reliability of the instruments, data collection method and data analysis.

2.1 Research Design

The design used for the study was Survey Research Design. In survey research, the researcher selects a sample of respondents from a population and administers a standardized questionnaire to them. The questionnaire, or survey, can be a written document that is completed by the person being surveyed, an online questionnaire, a face-to-face interview, or a telephone interview (source: http://writing.colostate.edu/guides/research/survey/pop2a.cfm). This design method was considered appropriate for this research because the researcher used questionnaires and interviews to explore why fixed line broadband internet access is not popular among Ghanaian households.

However, this method has its advantages and disadvantages. The advantages of using the method include the following: surveys are relatively inexpensive, especially self-administered surveys. This method is useful in describing the characteristics of a large population. Surveys can be administered from remote locations using e-mail or telephone and many questions can be asked about a given topic giving considerable flexibility to the analysis. There is flexibility at the creation phase in deciding how the questions will be administered: as face-to-face interviews, by telephone, as group administered written or oral survey, or by electronic means.

The weakness or disadvantage of this method is that the researcher must ensure that a large number of the selected sample will reply

(Source: http://writing.colostate.edu/guides/research/survey/com2d1.cfm).

3.2 Population And Sampling Technique

According to Joan Joseph Castillo (2009), a research population is generally a large collection of individuals or objects that is the main focus of a scientific query. There are two types of population namely, target population and accessible population. The target population refers to the entire group of individuals or objects to which researchers are interested in generalizing the conclusions. The accessible population is the population to which the researchers can apply their conclusions. The accessible population is a subset of the target population and is also known as the study population. It is from the accessible population that researchers draw their samples.

From the above definitions, we define our target population to all literate people and fixed line broadband ISPs in Ghana. Due to time constraint and limited resources, the accessible population drawn from the target population consists of teaching staff and office clerks in Takoradi Polytechnic, workers of State Insurance Corporation (S.I.C.)-Takoradi, workers of two hotels in Takoradi, some households around Takoradi Polytechnic, three internet cafes in Takoradi, and VODAFONE-Takoradi. The estimated accessible population size is about 500. It is from this population size that the researcher obtained his sample size. Using a sample size determination table published by university of Florida (Source: http://edis.ifas.ufl.edu/pd006), the researcher obtained a sample size of 83. The common characteristic of the accessible population is that they are all literate.

The method that was used to select the sample is a combination of judgment and random sampling. Judgment sampling is a common non-probability method and the researcher selects the sample based on judgment. For example, a researcher may decide to draw the entire sample from one "representative" city, even though the

population includes all cities. Random sampling is the purest form of probability sampling. Each member of the population has an equal and known chance of being selected (source: http://www.statpac.com/surveys/sampling.htm).

3.3 Research Instruments

The researcher used interviews and questionnaires to collect data in addition to data gathered from reports and articles. The two main types of questions that were used in designing the questionnaire were: open-ended and closed-ended questions.

Open-ended questions permit free responses which should be recorded in the respondents' own words. Such questions are useful for obtaining in-depth information on facts with which the researcher is not very familiar, and also getting opinions, attitudes and suggestions of informants. Closed questions have a list of possible options or answers from which the respondents must choose. Closed questions may be used to get the respondents to express their opinions or attitudes by choosing rating points on a scale.

The questionnaires were administered to educated people in the accessible population. The reason for using questionnaire is that respondents can answer questions at their convenience.

Using the interview method, the researcher conducted face to face interviews with individuals in the accessible population who can provide information about the problem under study or about their own perception of the problem. The reason for using interview is that there is interaction between the interviewer and the respondent.

3.4 Validity and Reliability of the Research Instruments

Validity refers to the degree to which an instrument accurately reflects or assesses the specific concept that the researcher is attempting to measure. In order words, validity refers to the accuracy or truthfulness of a measurement. There are no statistical tests to measure validity. All assessments of validity are subjective opinions based on the judgment of the researcher. There are at least three types of validity that should be addressed: face validity, content validity, and construct validity.

Face validity refers to the likelihood that a question will be misunderstood or misinterpreted. Pre-testing a survey is a good way to increase the likelihood of face validity.

Content validity refers to whether an instrument provides adequate coverage of a topic. Expert opinions, literature searches, and pretest open-ended questions help to establish content validity.

Construct validity refers to the theoretical foundations underlying a particular scale or measurement. It looks at the underlying theories or constructs that explain a phenomenon. In other words, if you are using several survey items to measure a more global construct (e.g., a subscale of a survey), then you should describe why you believe the items comprise a construct. If a construct has been identified by previous researchers, then describe the criteria they used to validate the construct. A technique known as confirmatory factor analysis is often used to explore how individual survey items contribute to an overall construct measurement.

Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials. Without the agreement of independent observers able to replicate research procedures, or the ability to use research tools and procedures that yield consistent measurements, researchers would be unable to satisfactorily draw conclusions, formulate theories, or make claims about the generalization of their research. There are three basic methods to test reliability: test-retest, equivalent form, and internal consistency.

A test-retest measure of reliability can be obtained by administering the same instrument to the same group of people at two different points in time. The degree to which both administrations are in agreement is a measure of the reliability of the instrument.

The second method of determining reliability is called the equivalent-form technique. The researcher creates two different instruments designed to measure identical constructs. The degree of correlation between the instruments is a measure of equivalent-form reliability.

The third method of estimating reliability use measures of internal consistency. When an instrument includes a series of questions designed to examine the same construct, the questions can be arbitrarily split into two groups. The correlation between the two subsets of questions is called the split-half reliability. (Source: http://www.statpac.com/research-papers/research-proposal.htm#chapter-3 , http://www.statpac.com/customer-satisfaction.htm#reliability).

In order to test the validity of the research instruments in this thesis, the researcher gave a final copy of the questionnaire to a friend to complete. The respondent was told to ask any clarification in case a particular question was not clear to him. In that case the researcher got to know questions that were not clear and corrected them. The researcher gave the corrected questions to a new respondent to complete and continue the process until there were no defective questions. The researcher also used the interview questions to test a friend to find

its validity and corrected any defective question.

After the validity test, the researcher used the test-retest method to access the reliability of the research instruments. In this case, the researcher gave two of the questionnaires to friends to complete and collected them. Five days later, the same questionnaires were given to the same people to complete. When the two responses from each person were compared, they were found to be the same. This indicated that the instrument was reliable. The same method was applied to the interview questions to test its reliability and it was found to be reliable.

3.5 Data Collection Procedure

The data was collected using questionnaires and interviews. The questionnaires were distributed to some people in the accessible population using the sampling procedure described above and fixed line broadband internet access provider (Vodafone). Three days later, the researcher went round to collect the questionnaires. In all 100 questionnaires were distributed but only 85 responses were received by the researcher.

After collecting the questionnaires, the researcher interviewed some people in the accessible population in order to get detail information on the problem. In this case 18 people were interviewed and their responses were written for analysis.

3.6 Data Analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of highlighting useful information, suggesting conclusions, and supporting decision making. In most social research, the data analysis involves three major steps, done in roughly this order: Cleaning and organizing the data for analysis, Describing the data, and Testing Hypotheses and Models. (Source: http://www.socialresearchmethods.net/kb/analysis.php)

In this research, SPSS for Windows was used to organize some of the responses (data) into frequency tables and cross-tabulations. Other responses were also used to produce simple graphs using the SPSS. The frequency table, cross-tabulations and graphs were used to discuss or describe the data collected. Discussion of the findings was done with respect to the research questions to find out which data answers the research questions. Data collected from the interview was grouped into related subject matters and discussed. Some verbatim responses were also presented for discussion.

3. RESULTS AND DISCUSSIONS

This section contains the presentation and discussion of the findings. The results part consist of the summary of the findings from the questionnaires and interview whiles the discussions part comprises the implications and significance of the findings.

The findings were summarized into frequency tables and charts using SPSS for Windows. In order to answer the research questions, the researcher designed and administered 100 questionnaires to respondents in the accessible population but only 85 were received. The questions were divided into 3 sections. The first section was answered by all the 85 respondents. Out of the 85 respondents, those who use fixed line broadband internet access at other places but not their homes answered the second section in addition to the first section. That is, people who do not subscribe to fixed line broadband at home but have experience of using the service. Lastly, out of the 85 respondents, those who subscribe to home fixed line broadband answered the third section in addition to the two sections.

In addition to the questionnaires, the researcher conducted interview to get additional and detailed information on the problem.

The results in Table 1 indicate that out of the 85 respondents, 14 subscribe to fixed line broadband internet access (DSL) which represents 16.5% of the respondents. Also a total of 42 respondents do not subscribe to home fixed line broadband internet access but use fixed line broadband internet access (DSL) at offices or cafes. Finally, 29 out of the 85 respondents do not use fixed line broadband access at home, cafes or offices. This category might use other methods of accessing the internet such as satellite connection, mobile broadband, dial up, WIMAX, or ISDN.

From table 2, out of the 85 respondents, 29 said they have access to the internet at home whiles 56 said they do not have access to the internet at home. The home access method can be fixed line broadband, mobile broadband, satellite connection, dial up, ISDN or WIMAX.

Our interview results showed five (approximately 31%) out of the 16 interviewee do not know any method use to connect to the internet, but the remaining 11 (approximately 69%) mentioned mobile (wireless) broadband modem. Four out of the 11 mentioned fixed line broadband as well, 2 of the 11 mentioned satellite as well, and 1 person mentioned mobile modem and mobile phone. This means that only 25% of the interviewees know the fixed line broadband method.

From table 3, out of the total number of respondents who said they have access to internet at home, 14 said they use fixed line broadband internet access, 12 use mobile broadband, while 3 use other methods like mobile phone, WIMAX, satellite connection etc.

We asked people who do not have access to internet at home to give reasons why they don't have, so that he can learn at first-hand what their problems are. Table 4 summarizes the various reasons why those respondents who said they do not have internet access at home do not subscribe to home fixed line broadband internet access. Out of the 85 respondents, 56 who do not have access to internet at home gave various reasons. The most popular among the reasons (given by 33 respondents) is lack of money to subscribe to home internet. Other less popular reason given is lack of interest in subscribing to home internet (12 respondents) and another reason given by 11 respondents for no subscription because they are not regular users of the internet. The interview results also indicate that out of 4 respondents who said they have the fixed line broadband connection at their localities, 3 said they haven't subscribed because there is no money whiles one person said he has internet service at his workplace and therefore he doesn't need home internet access. This establishes that most people prefer to have home internet service but they do not have funds to subscribe to the service.

Product differentiation enables a company to enjoy competitive advantage over its rivals. Because of this fact, we found it laudable to find out whether people know the advantages that fixed line broadband has over other competing modes such as satellite and mobile broadband. Table 5 indicates the results of this pursuit. Accordingly, 86% (73) of the 85 respondents who have attained a minimum educational level of Junior High School said they have no knowledge of its, while the remaining 12 said they know some of the advantages of fixed broadband over competing modes such satellite and mobile broadband. This is an indication that most people do not know the advantages that fixed line broadband internet access has over other competing methods (such as mobile broadband, satellite, WIMAX etc.). This implies that customers cannot take any decision in favor of fixed line broadband internet access when it comes to subscription to home internet access. Those who claimed that they know the advantages of fixed line broadband internet access gave some of the advantages in relation to the convenience of fixed line broadband internet access and the degree of privacy. These indicate that though they claimed to have knowledge of the advantages of fixed line broadband internet access over other methods of accessing the internet, they virtually know nothing.

In order to find out the importance that people attach to the use of the internet, we decided to find answer to the question in connection to the usage of the internet. The results in Table 6 indicate that only 9 respondents out of the 85 (10.59%) perceive the internet as not important whiles the rest see the internet as very important. This means that majority of the respondents agree that the internet is very important to them. Thus, most Ghanaians perceive the internet as important in their lives.

One of the research questions that we wanted to answer is whether fixed line broadband connection is available at most residential areas so that we can determine whether or not non availability of the connections is one of the causes of the low patronage of fixed line broadband internet access in Ghana. In order to access the availability of fixed line broadband connections at residential areas, we asked respondents whether the connections are available at their localities. Figure 1 shows the results of the responses. Observe that 35 responded yes to availability of the connections whiles 50 responded no. Also interview response buttress this fact. According to our interview, 8 out of the 16 interviewees said the connection is not available at their localities whiles 5 said it is available in their localities. The remaining 3 respondents said they could not tell. This means that non availability of the fixed line broadband connections might be responsible for the low patronage of fixed line broadband internet access. This is because if a customer has any intention to subscribe to fixed line broadband internet access he cannot carry out his intention unless the connection is available in his locality.

The researcher wanted to know whether those respondents who said the connections are not available in their localities would prefer to subscribe to the fixed line broadband internet access if the connections are available in the localities in which they reside. Table 7 contains the summary of the responses. 45 out of the 71 respondents who do not subscribe to fixed line broadband at home and fall in the very low, low, and average income group said they would subscribe whiles the remaining 26 which fall in the low and average income group said no to willingness to subscribe. When we asked them to state the reason for the reluctance to subscribe, the following among others were some of the responses: "I am not interested", "I am not always at home" and "It is expensive"

The responses in Table 8 indicate whether users are satisfied with fixed line broadband internet access or not. The results indicate that 43 out of 56 of the respondents are satisfied with the service whiles 13 out of 56 are not satisfied. When those who are not satisfied were asked to state their complaints, the following were some of the responses: "it is slow", "the service is not always available due to internet failures" and "the servers are too slow thus it takes time to do what you have to do"

When there are problems associated with the use of a particular service, prospective users are being discouraged from subscribing to the service. It is against this background that we carried out an empirical study to find out if users face problems with fixed line broadband internet access. Figures 2 and 3 present results, respectively, on the reliability of the link and its speed. Out of the 56 fixed line broadband users, 38 said the link speed of fixed line broadband internet access is not better than that of mobile broadband. This means that they can download or

upload information faster by using mobile broadband than fixed line broadband links. Only 18 out of the 56 users said the link speed of fixed line broadband is better than mobile broadband (see Figure 3). In our quest to establish the consistency of our findings, we sent a questionnaire to VODAFONE, the only fixed line broadband ISP in Takoradi. According to the respondent, subscribers complain about the speed and reliability of their link. In addition, the respondent confirmed that there is high traffic on their network. No response was given to our enquiry which relates to measures that his company has taken to improve fixed line broadband internet access to its customers. Perceive also that 36 out of the 56 users said the link is reliable whiles the remaining 20 think the link is not reliable because it goes down more often as illustrates by Figure 2. Regardless of the positive affirmative of majority of users in respect of the reliable nature of fixed line broadband, the results in view of the link speed constitute empirical evidence that fixed line broadband internet access has some technical problems associated with its use and needs an attention in order not to discourage prospective users.

The researcher wanted to find out those who have any intention to stop using fixed line broadband internet access and the reasons for their intention. From Figure 4, 44 out of the 56 respondents said they do not have any intention to stop using the service whiles the remaining 12 users said they have intended to stop using the service. Poor customer service and the preference attached to faster and reliable mobile service like telecom modem were some popular factors influencing users with the intention to stop using fixed line broadband.

Another important research question that we intended to answer is whether fixed line broadband internet access is affordable to an average income earner. One important factor that the researcher decided to find out is the price of fixed line broadband internet access. This is because the price of a commodity affects its demand. It is a common knowledge that the lower the price of a commodity, the higher the demand and vice versa. The results in tables 9 and 10 show how subscribers see the price of fixed line broadband internet access. Although an interview with VODAFONE Ghana informs that subscribers do not complain about their bills and initial subscription fee, from Table 9, 12 out of 14 subscribers say their bills are high whiles only 2 say their bills are moderate. Also, 8 out of 14 subscribers see their initial subscription fee as high whiles 6 subscribers see their initial subscription fee as moderate as demonstrates in Table 10. In both cases, we contend that fixed line broadband internet access is not affordable to most people. In order words, fixed line broadband internet access is expensive.

In addition to the above findings from the questionnaires, the researcher also used interview to find additional and detailed information on the issue. The researcher interviewed 18 people using face-to-face method.
Before anybody will decide to subscribe to home internet service then that person is a computer literate. This is the more reason we decided to find out if most educated Ghanaians are computer literate. When the 18 interviewees were asked, as to whether they are computer literate, they all responded yes with exception of one Senior High School graduate who said no. This implies that majority (94%) of the respondents are computer literate. It is therefore an indication that most educated Ghanaians are computer literate.
We went further to ask respondents if they knew what an internet is. Out of the 17 respondents who said they are computer literate, 94% (16 out of 17) said they know what an internet is. Only one respondent (Diploma holder) said she does not know what an internet is.
Besides being a computer literate, only people who are internet literate and know the uses of the internet will take a decision to subscribe to home internet service. However, few people who may not be internet literate will decide to subscribe to home internet before learning how to use the internet. It is against this background that the researcher tried to find out if most educated Ghanaians know how to use the internet. Out of 16 people who said they know what an internet is, in response to the interview, 12 said they know how to use the internet while four said they don't know how to use the internet. When the 12 respondents were asked to mention some of the uses of the internet, each was able to state at least two uses. Popular among the uses mentioned are communication via e-mail and searching for information. This is an indication that most Ghanaians are computer literate.
We also asked respondents in our interview if they knew how to use the internet and where they can get access to it. Out of the 16 respondents who know what the internet is, 75% (12 interviewees) said they know how to use the internet while 25% (4 interviewees) said they don't know how to use the internet. Further, about 69% of the respondents mentioned café as the only place they know they can get access to the internet whilst the remaining 31% mentioned both the work place and the café.
Customers will be willing to subscribe to a particular service only when they have knowledge of the uses of the service. In view of that we interviewed people on the use of fixed line broadband. Out of the 16 people who said they know how to use the internet, only 4 respondents said they know the use of fixed line broadband, and they explained that fixed line broadband is the use of land line to deliver internet service to homes and offices. The remaining 12 respondents said they don't know the use of fixed line broadband service. These responses indicate that most people do not know the use of fixed line broadband internet access.
Conclusively, our findings reveal that:

- Most educated people in Ghana are computer literate
- Most people who are computer literate know how to use the internet
- The main reason why most internet literate people in Ghana do not have access to home internet is lack of money
- Most educated people in Ghana perceive the internet as important
- Most educated Ghanaians are ignorant about fixed line broadband internet access
- Most internet users do not know the advantages of fixed line broadband internet access over other methods like satellite and mobile broadband
- Fixed line broadband connections are not available in most residential areas
- Fixed line broadband internet access is perceived as expensive
- Fixed line broadband internet access is perceived as slow

4   CONCLUSIONS AND RECOMMENDATIONS

We conclude on the basis of the findings of this paper that the factors that account for the low patronage of fixed line broadband internet access among households in Ghana include, but not limited to, ignorance about fixed line broadband internet access, lack of knowledge of advantages of fixed line broadband internet access, low income among households, lack of fixed line broadband connections in most residential areas, high cost of subscribing to fixed line broadband internet access, and slow pace of downloading and uploading information.

These factors accounting for the low patronage of fixed line broadband internet access necessitate recommendations to be implemented by fixed line broadband internet access providers and the relevant stakeholders.

In the first stance, we recommend that the general public should be sensitized on the use of fixed line broadband connections as a method of connecting to the internet by using promotional tools such as adverts since most Ghanaians are ignorant about fixed line broadband internet access. As equally important, internet users must be educated on the advantages of fixed line broadband internet access through the mass media as most internet users do not know the advantages of fixed line broadband internet access over other methods of connecting to the internet. It is also our candid suggestion that there should be a study on improving bandwidth speed of fixed line broadband internet access and its effect on demand of the service. This we make in the light of the fact that most fixed line broadband internet users complain of the pace at which information is downloaded and uploaded. Furthermore, a study should be carried out to find out if price reduction of fixed line broadband internet access will make the ISPs financially viable and also lead to increase in demand of their services. Last but not least, we respectfully recommend that a study be conducted on the financial viability of expansion of fixed line broadband connections to more localities. This is because fixed line broadband connection is not available in most of the residential areas and as measures are being taken to increase demand there should be a corresponding supply to meet the demand.

The fact that fixed line broadband internet access is losing patronage does not mean it has collapsed completely. Something can be done to revamp it so that it will attract its due market share. The recommendations made in this report should therefore be taken up to improve the patronage of fixed line broadband internet access in Ghana.

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Table 1: Categories of respondents

	Frequency	Percent
home fixed broadband access	14	16.5
office fixed broadband access	21	24.7
cafe fixed broadband access	21	24.7
does not use fixed broadband access	29	34.1
Total	85	100.0

Source: SPSS output of field data, 2011

Table 2: People having access to home internet

	Frequency	Percent
yes	29	34.1
no	56	65.9
Total	85	100.0

Source: SPSS output of field data, 2011

Table 3: Type of home internet connection used by respondents

	Frequency	Percent
fixed line broadband	14	16.5
mobile broadband modem	12	14.1
other (mobile phone, etc)	3	3.5
no internet access	56	65.9
Total	85	100.0

Source: SPSS output of field data, 2011

Table 4: No access to home internet * Reason for not having home internet access Cross tabulation

	Reason for not having home internet access			Total
	no money to subscribe	not interested in subscribing	not regular user and therefore no need to subscribe	
Access to home internet no	33	12	11	56
Total	33	12	11	56

Source: SPSS output of field data, 2011

Table 5: Access to home internet * Knowledge of advantages of fixed line broadband Cross tabulation

		Knowledge of advantages of fixed broadband		
		yes	no	Total
Access to home internet	yes	6	23	29
	no	6	50	56
Total		12	73	85

Source: SPSS output of field data, 2011

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Table 6:   Respondent's highest education level attained * Perceived value of internet Cross tabulation

		Perceived value of internet				Total
		not important	slightly important	important	very important	
Highest education level attained	Junior High School/Middle School	2	0	0	3	5
	O-level/A-level/Senior High School	1	5	3	6	15
	Diploma/Bachelor/Professional certificate	6	12	17	27	62
	Post Graduate	0	0	0	3	3
Total		9	17	20	39	85

Source: SPSS output of field data, 2011

Table 7: Income group in Ghana Cedis * Respondent's willingness to subscribe to fixed line broadband Cross tabulation

		Willingness to subscribe to fixed broadband		Total
		yes	no	
Income group in Ghana cedis	very low (monthly income below GH 100)	12	0	12
	low (monthly income between GH 100 and GH 500)	18	6	24
	average (monthly income GH 500 and GH 1000)	15	20	35
Total		45	26	71

Source: SPSS output of field data, 2011

Table 8:   Respondents' satisfaction with fixed line broadband service

	Frequency	Percent
yes	43	76.8
no	13	23.2
Total	56	100.0

Source: SPSS output of field data, 2011

Table 9: Income group in Ghana cedis * Subscriber's view of bill paid Cross-tabulation

		Subscriber's view of bill paid		Total
		moderate	high	
Income group in Ghana cedis	low (monthly income between GH¢100 and GH¢500)	0	2	2
	average (monthly income GH¢500 and GH¢1000)	0	10	10
	high (monthly income more than GH¢1000	2	0	2
Total		2	12	14

Source: SPSS output of field data, 2011

Table 10: Income group in Ghana cedis * Subscriber's view of initial subscription fee Cross-tabulation

		Subscriber's view of initial subscription fee		Total
		moderate	high	
Income group in Ghana cedis	low (monthly income between GH¢100 and GH¢500)	0	2	2
	average (monthly income GH¢500 and GH¢1000)	6	4	10
	high (monthly income more than GH¢1000	0	2	2
Total		6	8	14

Source: SPSS output of field data, 2011
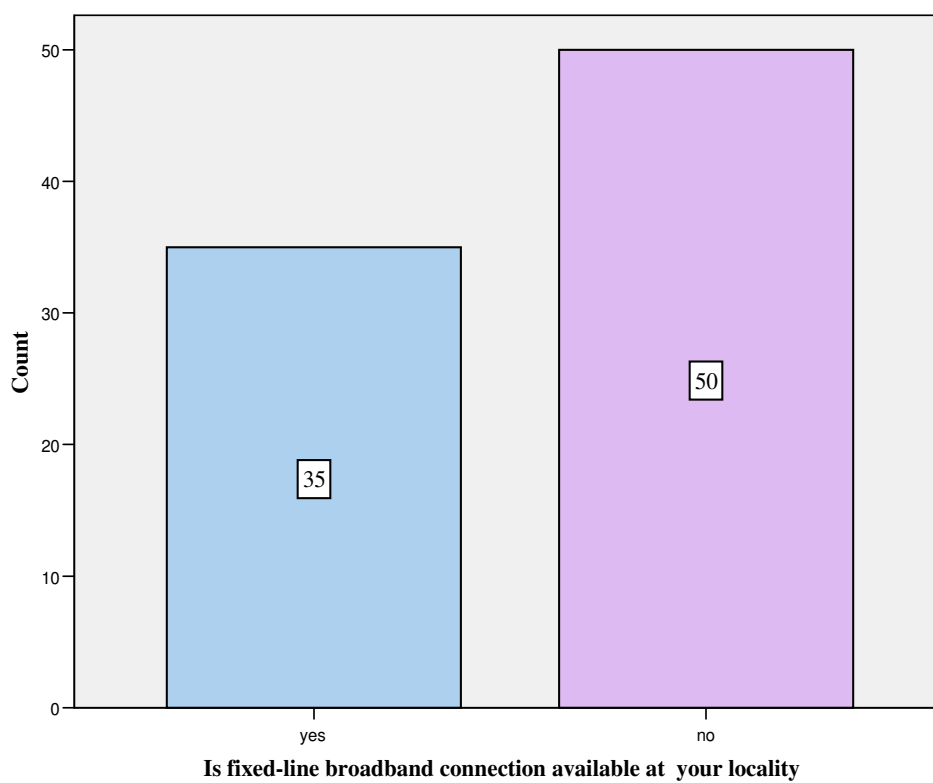
Figure 1: Availability of fixed line broadband connections at respondent's locality
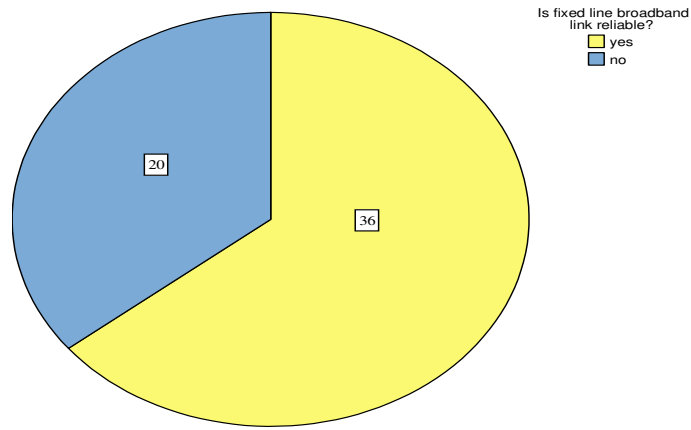Source: SPSS output of field data, 2011

Figure 2: Users' view of the reliability of fixed line broadband link
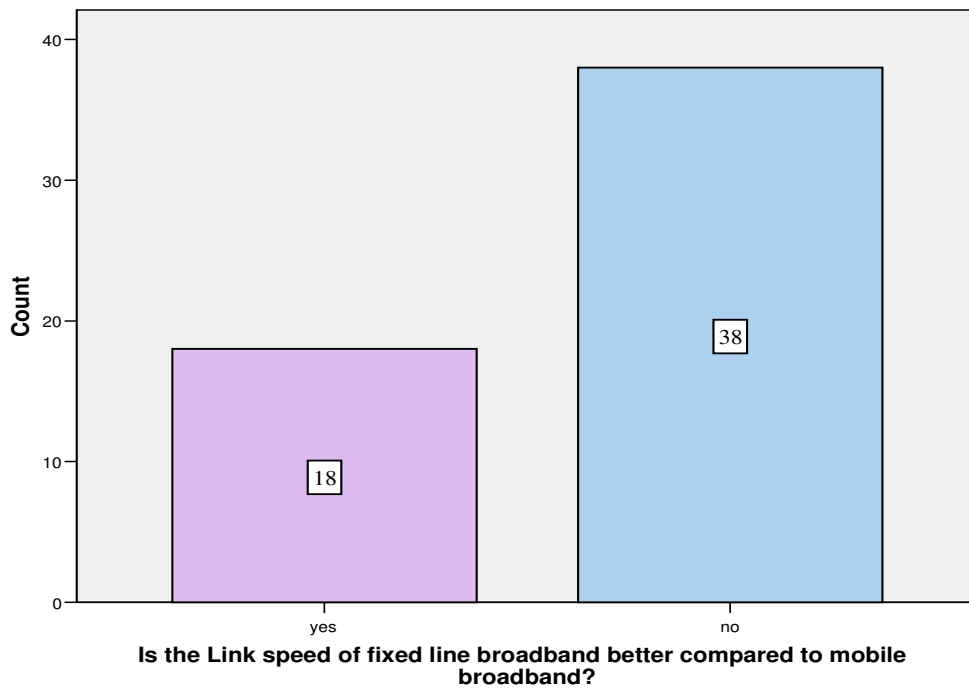Source: SPSS output of field data, 2011

Figure 3: Users' view of link speed of fixed line broadband compared to mobile broadband
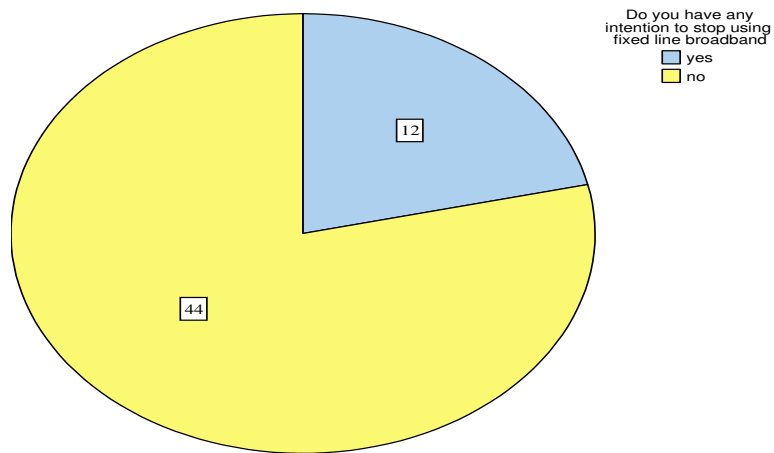Source: SPSS output of field data, 2011

Figure 4: Users' intention to stop using fixed line broadband internet access
Source: SPSS output of field data, 2011