

# The Economic Effects and Awareness of Health Implications of Mobile Phone Usage among Students of the University for Development Studies

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## ABSTRACT

This paper investigated the economic and health effects of mobile phones usage among students of the University for Development Studies (UDS). Research shows that excessive use of mobile phones has its corresponding consequences, which can either be positive or negative. The findings of this research showed that the three topmost economic impacts of mobile phones on students are that, mobile money can be used to pay for utility bills. Secondly, the mobile money industry creates jobs for agents; and thirdly, mobile phones enable one to communicate with ease without having to travel. Results of the investigation further showed that mobile phone usage has adverse health effects. For example, long hours of using mobile phones might lead to serious health issues. Also, mobile phone usage emits electromagnetic radiation, which can cause cancer; and further, staring at a mobile phone for many hours can cause eye problems in the future.

**Keywords:** Mobile phone, cell phone, smartphone, economic effect, health effect

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## INTRODUCTION

According to Rabiou et al. (2016), globalisation has led to changes in our lives. One of the ways in which globalisation is changing our lives through communication is as a result of growth in Information and Communication Technology (ICT). The mobile phone is one of the ICT's tools used in communication. These mobile phones are not just for voice communication, but it is also a tool for sending short message service (SMS) or texting (Rabiou et al., 2016). The mobile phone is an essential medium for communication among students. In India, all domestic items are communal, but it is the mobile phone which qualifies to become the first private, secluded and classified item of ownership.

A mobile phone is a movable handset that can make and receive calls over a radio frequency link while the

client is moving within a telephone service region. According to Wikipedia, modern mobile telephone services use a cellular network architecture which is called cellular phones or cell phones, in North America. Wikipedia also adds that the 2000s-era mobile phones support a variety of other services, such as text messaging, MMS, e-mail, internet access, short-range wireless communications (infrared, Bluetooth), business applications, video games, and digital photography. Wikipedia further adds that mobile phones offering only those capabilities are known as feature phones; mobile phones which significantly advanced computing capabilities are referred to as smartphones (Wikipedia). There are different types of mobile phones; smartphones and feature phones. According to Wikipedia (n. d), smartphones have some distinguishing

features. In the developed world, smartphones have now overtaken the usage of previous movable systems. However, they account for about 50% of mobile telephony in the developing countries (Wikipedia, n. d). According to Olanrewaju (2015), different types of mobile phones have been produced by different phone manufacturers; each of which comes with various features for different/specific function(s). He states that different variety of mobile phones as named by their manufacturers includes: Nokia, Samsung, Motorola, Sagem, Sendo, Siemens, T-mobile, Thuraya, Vodafone, Sony Ericsson, Bluebird, Alcatel, Tecno, Blackberry, etc. Some phones can make video calling, beep, take more clear-cut pictures/photographs, surf the internet and lots more. They are also built/installed in with different capacities, mode of operation and features/ applications. For example, 17-megapixel phones usually will produce clearer pictures/ photographs. Examples of Android-enabled devices such as HTC, Techno, and many others are the most modern kinds of mobile phones extensively used by both young and the aged, particularly among students (Olanrewaju, 2015).

PC Magazine Encyclopedia defines a feature phone as a cell phone that contains a fixed set of functions beyond voice calling and text messaging. He adds that feature phones may offer Web browsing and e-mail, but they generally cannot download applications from an online marketplace. Again, according to PC Magazine Encyclopedia, the "feature phone" moniker made sense when it was introduced in the late 1990's because they included more functions than a regular cell phone. Today, the gadget is more of a "featureless phone" compared to the ever-growing functionality of a smartphone.

Smartphones generally use a mobile operating system that often shares common traits across devices (Wikipedia, n. d). The third type of phone called the kosher telephone has restricted features and rabbinical approval for use in Israel and elsewhere by observant Orthodox Jews and is intended to prevent immodesty. Writing on the topic "Introducing: A Kosher Phone Permitted on Shabbat," Rachel (2012) indicates that the kosher telephone released by the Zomet Institute can be used on Shabbat without breaking the Jewish laws of the day of rest. According to her, the 'kosher phone' can be dialed without technically connecting thus avoiding Shabbat prohibitions.

Surprisingly, studies on the influence of mobile phone in tertiary institutions of late have not been given a great deal of attention. However, it has been discovered that the usage of mobile phones by students in schools is problematic since it has adverse effects on their academic performance. It has practically affected the society's ease of access, security and coordination of trade and community actions and hence, has become part of the customs of the world (Rabiu et al., 2016). Sundari (2015) indicated that "studies have proven that the rampant use of social networking, texting and

chatting on mobile phones result in lower grades and poor academic performance of students".

Studies relating to students perception/about the economic and health implications of mobile phone usage among tertiary students can be viewed under; Economic Effects and Health Effects.

### Economic Effects

In her overview of mobile phone service and usage in Ghana, Addo (2013) indicated that "Mobitel initiated the first cellular (mobile) service in Ghana in the year 1992. She stated that in that year alone, the number of Ghanaians who owned mobile phones was 19,000. She also specified that the number of users increased to 43,000 in 1998. This number rose to 60,000 in the middle of 1999" (Addo, 2013). By August 2012, the estimated number of mobile phone users in Ghana was 24.4 million (Eto, 2012). According to the Citi Business News (2018), on Ghana Web, the telecom giant MTN Ghana Limited introduced mobile money in Ghana about ten years ago. The mobile money service was launched to help boost financial inclusions in the economy. Many people now prefer to make payments through the mobile money platform, because it is convenient to access the platform which has 29 million accounts.

In his work on A Sociological Outlook of Mobile Phone Use in Society, Chatterjee (2014) indicated that "mobile phones are used to provide mobile banking services. He stated that this might include the ability to transfer cash payments by secure SMS text message, in many countries" (Chatterjee, 2014). He observed that some mobile phones could be used to make mobile payments via direct mobile billing schemes or through non-contact payments. Chatterjee (2014) further posited that "mobile phones are more useful in trading", and argued that employers could stay connected with their employees and customers with the help of mobile phones. Accordingly, he is of the opinion that employers, employees and customers stand in a better position to know about the vital information and necessities regarding the development of the trade.

Sarwar and Soomro (2013) wrote on the Impact of Smartphones on Society and indicated that the introduction of smartphones had created new dimensions in business. They argued that smartphone vendors and the mobile application developing companies were enjoying the industry because it had created a new domain for them. Sarwar and Soomro (2013), also posited that another business sector introduced by smartphones is the mobile application market. The duo added that "vendors of different mobile operating systems had their application technology, and hence, had a separate demand for mobile applications (Sarwar and Soomro, 2013). Some of the conventional cellular phone markets identified by Sarwar and Soomro (2013) are the iPhone application market, BlackBerry application market, the Android

application market, and Microsoft mobile application market.

Wei and Kolko (2005) interviewed some people in Tashkent, Uzbekistan as part of their case study of mobile phone use and arrived at the following reasons why people owned a mobile phone. The first reason was prestige, the second was a necessity for work, and the third was a gift from parents. According to them, one of the business people noted that he needed the phone to run his business because he was often away from the office. They said that mobile phones are perceived as useful tools for work and are not just as an accessory.

Geoff (2013) examined the growth impact from the Cologne Institute for Economic Research report. Geoff observed that mobile phones enable new services and applications to provide opportunities that generate income. He also affirmed that access to information and increased communication through mobile communication facilitates coordination resulting in productivity gains. He asserted that mobile phones enable immediate responses to crisis and shocks that without them may lead to the destruction of crops and machinery, concluding that the effects tend to be larger in developing countries. His findings showed that there were significantly higher growth rates of mobile phone subscriptions in these countries. The results also revealed that in practice, mobile phones filled the gap that other poor or non-existent infrastructure in these countries left wide open. Accordingly, he indicated in his findings that it was not surprising that many innovations related to mobile phones were adopted more quickly in developing countries. This could perhaps, be because mobile phones are often the first and only way of communication without having to travel under challenging circumstances.

The significance of how the smartphone has impacted on economic development is that it has generated lots of jobs and other economic opportunities. For example, it created more than 10 million jobs and contributed at least \$336 billion to public funding in the United States alone. The GSMA further argues that the size of the mobile money economy is growing at an aggressive pace, and estimates that it could contribute as much as 5.1% to global GDP by 2020.

Londhe et al. (2014) write that the mobile phone technology has created a positive impact for enhancing job prospects, improving literacy and health care and thereby contributing to poverty reduction. They added that it had enabled a superior social network. Their study was to understand the socio-economic impact of mobile phones on the bottom of the pyramid (BOP) population.

Lynn (2010) commenting on a United Nations report released in October 2010 said that mobile phones are thinning out more rapidly than any other form of information technology. The report added that mobile phones could improve the livelihoods of the poorest people in developing countries. UNCTAD said in its

Information Economy Report. According to Lynn (2010), the UNCTAD Secretary-General, Supachai Panitchpakdi told a news conference on the report that mobile phone subscriptions will reach five billion in 2010, almost one person on the planet. He also said that penetration in developed countries was over 100 percent, with many people having more than one phone or subscription.

From the report, Lynn (2010) indicated that the economic benefits of mobile phones in LDCs were enormous. He argued that mobile phones had spawned a wealth of micro-enterprises, offering work to people with little education and few resources. In his view, the key to successful use of mobile phone is affordability, the report argues, lessons not learn by many African states. Governments need to monitor how poor people are using mobile phones and design policies to build on that. They must also ensure that poor people can use their phones. Hahn and Kibora (2008) write that mobile phones are regarded not only as devices to communicate but also as material objects which cause economic problems and may affect social relations through the uneven disposition over such objects. Citing the example of Burkina Faso, the duo argued that in many African countries; the growth of mobile phone usage had increased tremendously, reflecting the particular appreciation of these devices.

Mobile phones are used in many countries to provide banking services, which may include the ability to transfer cash payments by secure SMS text message (Wikipedia, n. d). The Bank of Ghana (2017) posits that the Mobile Money is gradually becoming a significant means of payment for the non-banked and the underserved in Ghana. In an article on the impact of Mobile Money on the payment system in Ghana, the Bank argued that the rapid growth in Mobile Money usage in Ghana was partly on account of increasing penetration and application of mobile phones, particularly in the rural areas. It maintained that the widespread proliferation of Mobile Money among the non-banked and underserved was the premise on recent advances in handset functionality, chip and mobile network technologies, and upgrade in Point-of-Sale (POS) infrastructure. The Bank of Ghana affirmed that these developments had improved the environment of Mobile Money solutions, and brought together different industry players, such as banks and mobile money operators to establish Mobile Money Businesses. The use of Mobile Money services as a means of payment brings some of the benefits to the user including convenience, speed, flexibility and affordability (GSMA, 2013).

Mobile Money could be described as electronic cash backed by the equivalent amount of the Bank of Ghana notes and coins stored using the Subscriber Identification Module (SIM) in a mobile phone as an identifier. Mobile Money is issued by Mobile Money Operators (MMOs) who keep the electronic account on the SIM in the mobile phone for users of Mobile Money.

According to GSMA (2013) examples of Mobile Money services comprise of electronic-wallets that are used to make peer-to-peer (P2P) transfer. It can also be used in receiving salary which is a government to person payments (G2P). Internationally, the average day by day worth of the P2P transactions on a Mobile Money platform is estimated to be about US\$35.00 or GHS150.00 (GSMA, 2013).

The Bank asserts that the Mobile Money industry creates jobs for the Mobile Money agents, service providers and users including Fintech companies, merchants, retailers and aggregator. The Bank of Ghana in 2016 reported that mobile money amount of transactions recorded a growth rate of 737.4 percent from 2012 to 2016.

The marked boost in mobile money patronage is not only one of its kinds to Ghana. African Countries such as Kenya, Uganda, Nigeria, and South Africa also recorded significant growth in mobile money transactions (Diniz et al., 2011). For example, Kenya's M-PESA mobile banking service allows clients of the mobile phone giant Safaricom to keep ready money balances which are recorded on their SIM cards (Wikipedia, n.d).

The Citi Business News of Friday, 17<sup>th</sup> August, 2018, reported on the subject "Mobile money transactions hit GHS104 billion. According to the report, mobile money transactions in the first half of 2018 hit GHS104 billion. The figure represented almost a double of the GHS68 billion recorded within the same period in 2017. The report indicated that the total transaction in 2017 was GHS 155.8 billion. It was hoped that in 2018, this figure could outstrip that of the previous year following recent innovations in that sector.

## Health implications

According to Chatterjee (2014), several studies, during the last decade, have tried to associate risk factors with the use of mobile phones, which appears to be problematic. He observed that some people are of the view that the electromagnetic radiation in the microwave range, which mobile phones use to operate may be harmful to human health (Chatterjee (2014).

Naeem (2014) writes that so many people used mobile phones globally and argued that a small margin increase in the occurrences of the adverse impact on health could have significant unrestricted health implications. Naeem (2014) affirms that the amount of radiofrequency energy a mobile phone user was exposed to is depended on several factors such as the technology of the phone and the distance between the phone and the user. Considering the possible health risks associated with mobile phone use, the World Health Organization (WHO) is so passionate about this and has ensured that research was exclusively conducted on the possible effects of mobile phone exposure. WHO recommended that the investigation should be concentrated on four thematic areas; cancer,

other health effects, electromagnetic interference, and traffic accidents.

According to WHO (2013), studies conducted do not indicate environmental exposure to RF fields. Also, research on other health effects of using mobile phones including changes in brain activity, reaction times, and sleep patterns, have shown that even where there may be effects, they are minor and have no apparent health significance. WHO, therefore, ensured that there were more studies underway to try to confirm these findings. Research also shows that mobile phones are used very close to some medical devices though the risk is much reduced for 3G phones and newer equipment. WHO was not able to establish any increased risk of brain tumors from the use of mobile phones?

Frei et al. (2011) assert that mobile phone use has become very popular among younger people, which potentially expose them to longer lifetime risks. The analyses from a Danish cohort study found no association between cell phone use and the incidence of glioma, meningioma, or acoustic neuroma, even among people who had been cell phone subscribers for 13 or more years (Frei et al. (2011). Nevertheless, WHO agreed to promote further research on this group and assess the health impact of RF fields on all studied endpoints? A long-term study by the US government in May 2016, proposed that radio-frequency (RF) radiation, can cause cancer if it is the type emitted by cell phones.

Rohan (2018) writes that individual countries, including France, have warned against the use of mobile phones by minors in particular, due to health risk uncertainties. He argues that children have the potential to be at higher risk than adults for developing brain cancer from cell phones. Also, their nervous systems are still growing and therefore more vulnerable to factors that may cause cancer.

Borelli (2013) stated that two studies conducted at the University of Essex in the United Kingdom where researchers studied the impact of a mobile phone device during a nose-to-nose conversation revealed that the presence of a cell phone, as two or more persons are talking face-to-face could produce unenthusiastic feelings towards the person who has his or device visible. Their results demonstrated that the presence of mobile phones could obstruct human interaction, an impact that is most apparent when persons are discussing critical personal matters.

Borelli (2013) also states that in a study conducted at the University of Gothenburg, Sweden, researchers discovered high mobile phone use was connected amid sleep disorder for women while soaring mobile phone use was linked to sleep disorder and signs of depression in men. According to Borelli (2013), the studies concluded that excessive phone use could be a risk factor for mental health issues in young adults. Borelli (2013) further noted that the studies argued that constant touching of your phone could harbour germs on your handset. In a related study conducted at the

London School of Hygiene and Tropical Medicine and Queen Mary, University of London, researchers sampled 390 cell phones and handsets to measure for levels of bacteria. According to Borelli (2013), the results of the study showed that 92% of the cell phones sampled had bacteria on them, and 82% of handsets had bacteria. This shows an increase in the risk of illnesses in your immune system.

Borelli (2013) again writes that the findings from the studies showed that responding to communication at a fast speed could result in pain and swelling of your joints. It is also common to experience back pain with amplified cell phone use, mainly if the phone is held between one's neck and shoulders as you multitask. This, thus lead to an increase in the risk of chronic pain. According Borelli (2013), the studies found that staring at your mobile device can cause problems in your vision later in life. These mobile devices screens tend to be smaller as compared to that of the computer, which means you, are likely to narrow your eyes and twist your eyes while reading these messages. There is thus an increase in the risk of eye vision problems.

On relationships, the findings of the study by the Cologne Institute for Economic Research, and reported by Geoff (2013) was that mobile phones had altered our relationships with family, spouses and close friends. On health, their findings showed that mobile phones significantly help to maintain physical and psychological health when family members move away from their homes.

This study attempts to solicit the views of students on the economic and health impact of mobile phones in tertiary institutions of Ghana and especially the UDS.

### **Statement of the problem**

Cell or mobile phones have become an integral part of us so much that when somebody loses a phone, it is like losing something so significant. According to Rabi et al. (2016, mobile phones have gained enormous ground in the lives of students all over the world. Our daily lives cannot be complete without access to a cell or mobile phone. Suryanarayana (2015) posits that it is very challenging to imagine how our lives would have been without a cell phone since most of our work is done using cell phones. The presence of cell phones presents a host of options and challenges for today's students. It can be a helpful academic tool or a hurtful educational disruption depending on the attitude and use pattern of the student or owner (Suryanarayana, 2015).

Suryanarayana (2015) also came up with a list of the positives and negatives of cell phones. Under positives, he listed; communication, more convenience, greater technology availability, entertainment, improved personal security, beneficial in studies, and finally, beneficial in business. He explained to them as follows: The very first positive point of mobile phones is communication because access to a mobile phone can

allow one to communicate with anyone from anywhere at any time. Also, business persons with smartphones can install applications like Skype which help them communicate with their clients on the go. Also, we can buy almost anything from our cell phone device, from clothes to groceries; perform transactions between bank accounts, or even check in for our flight. Accountants, salesmen, consultants and engineers are some of the few professions who use mobile phones to do their work. Suryanarayana (2015) identified the following as negative effects of mobile phone use as; more distraction, including engaging in inappropriate behaviours, and other health-related issues.

Related to the above, research has shown that mobile phones have numerous uses. They are used for a variety of purposes, such as keeping in touch with family members, for conducting businesses, and in the event of an emergency, one needs to have a mobile phone to reach out for help. Currently, in Ghana, it is impossible for a student in a tertiary institution not to own a phone. It will be highly unlikely to come across such a student, and even if there are such students, it is possible that their phones may be temporarily malfunctioning. One can also see people carrying with them more than one mobile phone at a time which they use for different purposes, such as for business and personal use. Multiple SIM cards may be used to take advantage of the benefits of different calling plans.

According to Wikipedia (n. d), mobile phones have been used in a variety of diverse contexts in society. For example, mobile phone sharing is common and has helped improve the poorest people in developing countries, by ensuring that people have access to information. On the contrary, it has impacted negatively on individuals and the society as a whole.

### **Significance of the Study**

The research study is essential because it would enable students to identify the economic and health implications of spending much of their time on mobile phones. They are also expected to recognize the impact that excessive use of their cell phones could have on their health. Further, they are more likely to comprehend the economic implications of mobile phone usage. This may include job creation for mobile money operators, and retailers of phone cards. The study would also make students appreciate the added advantage of using mobile phones aside from social media.

### **Objectives**

The primary objective of this research was to ascertain students' views on the economic and health effects of mobile phone usage in society. The specific objectives which the study sought to achieve are: To discover whether students identify the economic effect(s) of using a mobile phone and to ascertain the health

implications of excessive use of mobile phones.

### Research Questions

The research questions guiding the study were:

1. Do students have any knowledge about the economic effect(s) of using a mobile phone?
2. Do students have any knowledge about the health implications of excessive use of mobile phones?

## METHODOLOGY

### Overall Research Design

The research design used for the study was the survey research. The research sought to find out the perception about the effect of mobile phone usage among students in tertiary institutions of Ghana. This type of research involves collecting data through self-administered questionnaires or interviews. This design is particularly useful in describing the characteristics of a large population. It is also elastic in that many questions may be asked on a given topic, and this provides the researcher with considerable flexibility in his/her analysis.

### Time of Study and Project Area

The study was conducted on the Tamale Campus among undergraduate students of the University for Development Studies. The population of undergraduate students of the Tamale Campus is 6,729 (Academic Affairs Section, University for Development Studies, 2018). The student population of UDS for the 2017/2018 academic year stood at 17,144 (Academic Affairs Section, University for Development Studies, 2018).

The justification for selection of the study area was to solicit for responses from all categories of students on the Campus. The fieldwork was conducted from April to June, 2018, over a period of twelve weeks.

### Sample Size and Sampling

Undergraduate students of the Tamale Campus of the University for Development Studies were the target population of this study. The simple random sampling method was used by the researchers in selecting the target population. One hundred and sixty-six (166) students were sampled out of the total student population (6,729) of the Tamale Campus (Academic Affairs Section, University for Development Studies, 2018).

### Data Collection

The closed-ended structured questionnaire was used to collect the information from the respondents. Closed-

ended questionnaire is the type of questionnaire where respondents are only to tick the correct answer. Section A of the questionnaire was on demographic data and Section B contained questions on the set objectives and research questions. Respondents were also asked to respond on a 5-point Likert scale (1= Strongly Disagree; 2= Disagree, 3= Not Sure, 4= Agree, and 5 = Strongly Agree). The dependability of the research tool was determined by the test and re-test technique.

### Administration of Instrument and Method of Data collection

The researchers administered one hundred and sixty-six questionnaires to the randomly selected students on the Tamale Campus of the University. The researchers explained some portions of the questionnaire to respondents by way of minimizing errors in the questionnaire. All the questionnaires were intended to facilitate data collection and subsequently data analysis

### Data Analysis

All the questionnaires were adequately checked for completeness after which the information was coded and analyzed using the IBM SPSS Statistics Data Editor Version 20. There were 166 responses, and descriptive statistics using frequencies and their corresponding percentages were used for the analysis. At the end of the research, we expect that students who hitherto had little knowledge about the economic and health effects of using mobile phones would come to understand and appreciate the relevance of this study.

## RESULTS

The analysis looked at the demographic background of respondents. It also sought to consider responses as they relate to the objectives of the study in the text.

### Demographic background of respondents

From the demographic background of respondents, the total number of respondents was one hundred and sixty-six (166) out of which eighty-one representing 48.8% were males, and 85 representing 51.2% were females.

A careful study of Table 1 shows that the highest number of respondents (90) representing 54.2% were in the age group 20-24. Also, one respondent each representing 0.6% was in the age group 30-34 and 35+. This was an indication that many of the respondents were below 25 years.

On the level of education, 67 respondents representing 40.4% were in level 100 and 53 respondents representing 31.9% in level 200.

The study considered the programme of study of the respondents and found out that the majority of them

**Table 1:** Demographic profile of respondents.

S/N	Variable	Number of Respondents	Percentage
1	<b>Gender</b>		
	Male	81	48.8
	Female	85	51.2
	Total	166	100
	<b>Age</b>		
	15-19	30	18.1
	20-24	90	54.2
	25-29	44	26.5
	30-34	1	0.6
	35+	1	0.6
2	Total	166	100
	<b>Level of Education</b>		
	100	67	40.4
	200	53	31.9
	300	30	18.1
	400	13	7.8
	500+	3	1.8
	Total	166	100
	<b>Program of Study</b>		
	Sciences	70	42.2
3	Education	96	57.8
	Total	100	100
4			

Source: Survey Data (2018).

(96) representing 57.8% were pursuing education and the remaining 70 representing 42.2% were pursuing science-related programmes.

### Economic effects of using a mobile phone

A critical glance at the findings presented in Table 2 indicates that respondents perceive the economic effects of mobile phone usage to be enormous. Results of the investigations show that the topmost economic impact of using mobile phones is that mobile money could be used in paying for utility bills; secondly, the mobile money industry creates jobs for agents; thirdly, mobile phones enable one to communicate with ease without having to travel, and fourthly mobile money wallet is used for transfers and buying airtime.

From the findings, 139 respondents broken down as 90 representing 54.2% and 49 representing 29.5%, respectively, strongly agree and agree with the assertion that mobile money can be used to pay for utility bills. Also, 145 respondents made up of 89 representing 53.6% and 56 representing 33.7%, respectively, strongly agree and agree that the mobile money industry creates jobs for agents.

Further, 139 respondents consisting of 78 representing 47% and 61 representing 36.7% respectively, strongly agree and agree with the view that mobile phones enable one to communicate with ease without having to travel. Again, some respondents were of the opinion that mobile money assists business persons to transact businesses conveniently.

From the results of the investigations, 69 respondents representing 41.6% and 65 respondents representing

39.2%, respectively, strongly agree and agree that business persons can transact their businesses conveniently using the mobile phones. Another 135 respondents made up of 62 representing 37.3% and 73 representing 44% respectively strongly agree and agree that the mobile money wallet is used for transfers and buying airtime.

### Health impact/effects of using a mobile phone

Results of the investigations show that the three topmost health effects of using mobile phones are that long hours of using mobile phones could lead to serious health issues such as emitting electromagnetic radiation. The finding also shows that the staring of mobile phone for many hours can cause eye problems in future. From the results, 114 respondents consisting of 58 respondents representing 34.9% and 56 respondents representing 33.7%, respectively, strongly agree and agree with the assertion that long hours of using mobile phones might lead to serious health issues. The findings also show that more than one hundred and ten respondents made up of 58 respondents representing 34.9% and 54 respondents representing 32.5% strongly agree and agree with the view that mobile phone usage emits electromagnetic radiation which is harmful to the human body. Further, 113 respondents broken down as 49 representing 29.5% and 64 respondents representing 38.6 %, respectively strongly agree and agree that staring at a mobile phone for many hours can cause eye problems in the future. The findings also revealed that 120 respondents, which is made up of 46 respondents

**Table 2:** Responses to the economic effect of using a mobile phone.

S/n	Variable	SD	%	D	%	NS	%	A	%	SA	%	Total	%
1	Mobile phone use provides the opportunity to generate income via mobile phones can result in productive gains	18	10.8	9	5.4	20	12.0	67	40.4	52	31.3	166	100
2	A mobile phone could be used to respond to crisis and shocks	14	8.4	10	6.0	26	15.7	69	41.6	47	28.3	166	100
3	Mobile money can be used as a means of payment	17	10.2	14	8.4	43	25.9	53	31.9	39	23.5	166	100
4	Mobile phone enables one to communicate with ease without having to travel	13	7.8	11	6.6	20	12.0	60	36.1	62	37.5	166	100
5	Mobile money assist business persons to transact businesses conveniently	7	4.2	9	5.4	11	6.6	61	36.7	78	47.0	166	100
6	The mobile money industry create jobs for agents	6	3.6	10	6.0	16	9.6	65	39.2	69	41.6	166	100
7	Mobile money can be used to pay for utility bills	5	3.0	12	7.2	4	2.4	56	33.7	89	53.6	166	100
8	Mobile money operators are profit-maximizing entities	3	1.8	7	4.2	17	10.2	49	29.5	90	54.2	166	100
9	Mobile money wallet is used for transfers and buying airtime	8	4.6	6	3.6	38	22.9	66	39.8	48	28.9	166	100
10		8	4.8	8	4.8	15	9.0	73	44.0	62	37.3	166	100

**Source:** Survey Data (2018).

representing 27.7% and 76 respondents representing 45.8% respectively strongly agree and agree with the assertion that there are many health effects associated with the use of a mobile phone.

Table 3 at a glance shows that the majority of the respondents agree that there are health effects associated with the use of a mobile phone. The only issue that respondents disagreed on and were also not sure of was associating the use of the mobile phone with the salivary gland.

The study results also revealed that some of the respondents disagree and are not sure whether the use of cell phone for over ten years can result in one being diagnosed with a brain tumor.

## DISCUSSION

The findings of this study show that students' views on the economic and health effects of mobile phone usage in Tertiary institutions of Ghana are numerous and varied. These were either positive or negative. The findings on the economic effects of using mobile phones are first mobile money can be used to pay for

utility bills; secondly, the mobile money industry creates jobs for agents; and thirdly, mobile phones enable one to communicate with ease without having to travel. From the findings, 145 respondents agreed that the mobile money industry creates jobs for agents. These results were consistent with the findings by Londhe et al. (2014). Writing on the Socio-Economic Impact of Mobile Phones on the Bottom of Pyramid Population in a pilot study, Londhe et al. (2014) argued that the mobile phone technology had created a positive impact of enhancing job prospects, improving literacy and health care and thereby contributing to poverty reduction.

The findings of our study also revealed that 135 respondents agreed that the mobile money wallet is used for transfers and buying airtime. Further, the study results showed that 139 respondents agreed with the view that mobile money can be used to make utility payments. These findings are consistent with the Bank of Ghana's conclusions on the use of mobile money wallet. In a report by the Bank of Ghana, the Bank confirmed that in Ghana, the mobile money wallet is primarily used to transmit money from one person to another person (P2P), for payment of supplies and



**Table 3:** Responses to the health impact/effect of using a mobile phone.

S/n	Variable	SD	%	D	%	NS	%	A	%	SA	%	Total	%
1	Mobile phone usage emit electromagnetic radiation	20	12.0	8	4.8	26	15.7	54	32.5	58	34.9	166	100
2	Mobile phone use can cause harmful biological effects in humans	26	15.7	14	8.4	39	23.5	51	30.7	36	21.7	166	100
3	Long hours of using mobile phones might lead to serious health issues	19	11.4	6	3.6	27	16.3	56	33.7	58	34.9	166	100
4	Mobile phone use can be a risk factor for mental health issues in children	27	16.3	8	4.8	41	24.7	58	34.9	32	19.3	166	100
5	Many health effects are associated with using a mobile phone	12	7.2	12	7.2	20	12	76	45.8	46	27.7	166	100
6	Staring at a mobile phone for many hours can cause eye problems in future	21	12.7	12	7.2	20	12.0	64	38.6	49	29.5	166	100
7	Cell phone use over ten years can result in one being diagnosed with brain tumours	20	12.0	19	11.4	53	31.9	45	27.1	29	17.5	166	100
8	RF radiation, emitted by cell phones can cause cancer	18	10.8	11	6.6	31	18.7	66	39.8	40	24.1	166	100
9	Mobile phone use can be associated with salivary gland	16	9.6	19	11.4	67	40.4	43	25.9	21	12.7	166	100

**Source:** Survey Data (2018).

services such as purchasing of airtime, paying for DSTv, Gold and utility bills, some workers salaries, taxi fares, micro-credit, investments and micro-insurance (Bank of Ghana, 2017).

Findings from this study also showed that 134 respondents representing 80.8% agreed that mobile money assists business persons to transact businesses conveniently, reflecting the positive economic effect of the coming into being of mobile phones. As the Bank of Ghana (2017) posited, Mobile Money is gradually becoming a significant means of payment of the unbanked and the under-served in Ghana. In an article on the impact of Mobile Money on the payment system in Ghana, the Bank of Ghana argued that the rapid growth in Mobile Money usage in Ghana was partly on account of increasing penetration and application of mobile phones, particularly in the rural areas. The study results affirmed Sarwar and Soomro (2013) findings, which indicated that the introduction of smartphones had created new dimensions in business.

On the impact of Smartphone's on Society, they argued that smartphone vendors and the mobile application developing companies were enjoying the industry because it had created a new domain for them to cash in their activities.

The Citi Business News of Friday, 17<sup>th</sup> August, 2018

which reported on the subject "Mobile money transactions hit GHS104 billion affirmed the results of our findings where 119 respondents representing 71.7% agreed that mobile phone use provides the opportunity to generate income. According to the report by the Citi Business News, mobile money transactions in the first half of 2018 hit GHS104 billion. The figure represented almost a double of the GHS68 billion recorded within the same period in 2017. The report indicated that total transaction in 2017 was GHS 155.8 billion, but watchers of the space were predicting that the figure for 2018 could outstrip that of the previous year following recent innovations in that sector.

The study results on the health effects of using mobile phones showed that 122 respondents representing 73.7% agreed that there were many health effects associated with the use of a mobile phone (Table 3). This view was consistent and was affirmed by Rohan (2018) who indicated that some researchers had warned that minors should not use mobile phones due to its health risk uncertainties. Rohan (2018) argued that children had the potential to be at higher risk than adults for developing brain cancer from cell phones.

Also, the associating long hours of using mobile phones with serious health issues were affirmed by Borelli (2013). She argued that responding to messages at

rapid speed can cause pain and inflammation of one's joints. Borelli further explained that studies show that back pain is common with increased cell phone use, particularly when the phone is held in-between your neck and shoulders as you multitask. According to Borelli (2013), this was revealed in the findings of some researchers. Some of the health factors stated was that excessive phone use could be a risk factor for mental health issues in young adults. Also, earlier studies reported that constant touching of your phone could harbor germs on your handset. In a related study conducted at the London School of Hygiene and Tropical Medicine and Queen Mary, University of London, researchers sampled 390 cell phones and handsets to measure for levels of bacteria. The results of the study showed that 92% of the cell phones sampled had bacteria on them. This shows an increased risk of illnesses in mobile phone users' immune system.

Results from this study showed that, 112 respondents representing 67.4% of the respondents agreed that mobile phone usage emits electromagnetic radiation. This finding was consistent with that of Chatterjee (2014), who argued that several studies, during the last decade, had tried to associate risk factors with the use of mobile phones, which appeared to be problematic. Chatterjee (2014) stated that some people were of the view that the electromagnetic radiation in the microwave range, which mobile phone users operate, may be harmful to human health.

## Conclusion

Findings from this study show that significant number of the respondents have in-depth knowledge about the economic and health effects of mobile phones usage. Also, their views on the excessive use of mobile phones are that mobile phones can have both positive and negative effects; hence its use should be regulated. Furthermore, the study revealed that majority of the students who answered the questionnaires have in-depth knowledge about the economic and health effect(s) of using a mobile phone. It was also revealed in the study that there are a lot of economic effects of mobile phones which can be beneficial to individuals, businesses and the government. Also, the study showed that students agreed that staring at your phone for long hours can cause eye problems in the future, so they may be conscious of this and guide against it.

## Recommendation

1. Management should ensure that there are lay down rules and regulations in schools regarding the use of mobile phone devices especially during classes sessions despite the immense benefits associated with their use, and students must conform to them.

2. Students should be informed of the positive economic and negative health effects of mobile phone usage and the consequences of the over-dependence and unregulated use of their mobile phones.

3. The youth without jobs can become mobile money agents and earn a living. Once they are gainfully employed, they would make some income, and this can take some of the burdens off their parents regarding remittance. Accordingly, we recommend that many students and unemployed graduates should veer into the mobile money business or operations.

4. We also recommend that students' and the youth take advantage of the benefits involving the use of mobile money in transacting business. The resort to the usage of mobile money service will make them save time instead of joining the long queues in the banks to transact business.

5. Furthermore, we recommend that all students should transact business through their mobile money wallet. By so doing, they would save the cost of having to commute from their campuses to town for such engagements. Also, using their mobile money wallet in transacting their business would protect them from their monies being stolen by their friends and thieves.

6. Students should be discouraged from excessive use of their mobile phones since there are serious health implications associated with long hours of using them, as revealed in the literature.

7. The literature showed that excessive phone use could be a risk factor for mental health related issues in young adults. Accordingly, students should educate their younger siblings on this vital issue. They should in-turn regulate the extent and time they spend using their mobile phones.

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