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Research Paper

The impact of smartphones on the adolescent's Intelligence Quotient (IQ)

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Abstract

The aim of this research is to investigate the impact of smartphones on adolescents and their Intelligent Quotient (IQ). Smartphone as a handheld device which is capable of providing wireless voice communications and numerous powerful functionalities which enhances the human intelligence along with the support of other applications have brought positive benefits as well as negative challenges. This study will elaborate and demonstrate both the positive and negative impact of smartphone devices, its impact on the adolescent and their IQ, how the smartphone affects learning, how smartphone affects the brain and also investigate to see if smartphones really make adolescents smarter or not. Smartphone addiction was there since the discovery of the smartphone device. There have been so many changes & challenges in the students learning and concentration abilities. According to the recent research on college students published in the journal "Computers in Human Behaviour" by Ian M. McDonough (2017), which suggest that the presence of a mere smartphone device can impair student learning during a lecture. However, smartphone devices will generally affect learning if not used directly for the learning-related activities. The researchers found out that some college students tend to be more distracted when they noticed a text message on their smartphone while some students performed very badly on the quiz when they had their smartphones.

Keyword: Smartphones, Adolescents, Intelligence Quotient (IQ), Human intelligence.

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1.0 Introduction

According to Rambitan (2015), the fast-growing of technology has developed super electronic device with advanced features such as a smartphone whose functions are not limited to only text messaging but this device allows long-distance communication. Smartphone as a mobile phone with advanced features and functionalities beyond the traditional functionalities such as making calls and sending text messages. The smartphone devices are equipped with the capabilities to play games, video recording with a built-in cameras/audio recording, displaying of photos, email platform, social media site, browser, wireless internet etc. Perhaps, the smartphones of nowadays are equivalent to minicomputers as it has some features and functions similar to that of computer in its mini-form and is really handy. This is before Google introduced the Android operating system in 2007.

The smartphone revolution era started with the introduction of blackberry smartphone in mass communication market equipment with many features such as web browsing, email, internet and camera/audio. Apple entered into the market in 2007 and its product became a major breakthrough in the media communication industry as the company introduced its first ever smartphone.

There has been an explosion of technology since the beginning of the 21st century. A recent research shows that 94 percent of adolescents between the age of 18 and 29 have a smartphone, while 89 percent of those within the age of 30 to 49 age range own a smartphone. The adoption of smartphones has been tremendously in mainstream consumer markets in the world today.

Our research study will be focusing on the positive and negative impact of smartphone devices, its impact on the adolescent and their IQ, how the smartphone affects learning, how smartphone affects the brain and also investigate to see if smartphones really make adolescents smarter or not. According to Jean Twenge, a generation that has spent their entire adolescence with smartphones are feeling the effects, which includes the negative impacts on their mental health.

Smartphone device is now an integral part of modern telecommunications in every individual life. It is obvious that the population using a smartphone and the smartphone is increasing rapidly in every country. Besides making calls per day, the length of each call and the amount of time individuals use mobile phones/smartphone are also an important factor which could enhance the health-related risk.

The mobile phone (Smartphone) device emits radio frequency energy, a form of non-ionizing electromagnetic radiation which is when absorbed by any tissues close to the phone. However, the amount of emission will depend on the distance of individuals to their phones and the type of smartphone.

The use of smartphone device has changed the world. It has virtually subjected the world into a global village by enabling individuals to browse the web and communicate easily and quickly. It has also transformed so many businesses. Smartphone has contributed positive impacts to human, but too much dependency on the smartphone can also cause negative values.

However, as time goes by the youth became very fascinated with the smartphone device because of fascinating features such as chatting apps, banking apps, Health apps, shopping apps, E-hailing apps and so on.

Smartphone device turns out to be one of the technologies that spread faster and is been adopted widely by the world. Obviously, the way that individuals access information has really changed with the introduction of the smartphone. According to Anderson (2016), people who have a smartphone is using it beyond the mere function of calling and texting, by using it for video chatting, online shopping, watching movies, exchanging pictures and online banking etc. It is true that smartphone or mobile phone has made the world like a global village. People can now reach out to their lovely ones within a second and also browse information within a second.

2.0 Literature Review

Smartphone technology has changed the system in which human beings interact and communicate. The smartphone is obviously affecting the people and societies in various ways as it is used in so many different ways such as working, communication and learning. However, the smartphone has made life more convenient with so many advanced features that can assist individuals to manage their daily activities with just a click and things are done. Smartphone technology can also assist individuals to have access to a variety of information and also facilitate communication quicker.

The young generation is now occupied with Smartphone technology as it is now a trademark of the young generation (Skierkowski & Wood, 2012). The technology generation is now depended on the advance touchscreen technology were just by a touch to the application on the smartphone can be used at any time with the internet accessibility.

2.1 Impact of Smartphone on Brain

Smartphone device is now an integral part of our daily lives and they are almost like an extension of our lives at this point. Smartphone technology is really good and it has improved our communication industries and there no denying that smartphone does bring some harm and not only good.

Smartphone device radiation has been classified to be a possible human carcinogen as stated by World Health Organization. It has been said to increase the risk of brain cancer from heavy and long-term use.

According to the research conducted by the Radiation and Nuclear Safety Authority, the brain tissue damage could be instigated by radiation from smartphone device or mobile phones. The research shows that the bone marrow of a child's head absorbs almost ten times more radiation than that of adults. Stop your child from playing games with your smartphone device.

The human brain is very sensitive to electromagnetic radiation because smartphone device is powerful enough to accelerate our brain activities, even after 40 to 50 minutes of use.

The heavy usage of smartphone/mobile phones use could lead to individuals developing benign brain tumour when used more than 3-4 hours every day for the period of 15 years.

2.2 Impact of Smartphone on Education

Teaching and learning in higher education since the invention of the smartphone device has incorporated the use of information and communication technology (ICT) as it has been known to be a crucial component to be adapted in the development of social environment (Rung et al.,2014).

The positive impact of smartphones in the Education context, help the adolescents to access the various learning resources and also provide the opportunity for some individuals to progress with their distance learning Education. Smartphone use for educational purposes introduce students into the world of knowledge as students are able to obtain various kind of information by just a click. Smartphone device that is equipped with the internet enables some of the features provide students with the ability to be connected always and it's easier for them to access academic related resource online anytime.

According to Cochrane (2010), stated that the educational activities which incorporate smartphone use are accessing of course-related content resources, exciting sharing and discussion the session between teachers and students and retrieving information regarding students' performances. However, smartphone use could lead to important influence in improving students' performance as a smartphone might boost learning and teaching experience.

Smartphones use in learning can further, lead students to be aware of some supports attached to learning anything or having access to educational materials anywhere and anytime and thereby encourage students to be involved in learning activities because technology will always bring a lot of prospects especially in their academic activities.

Froese et al. (2012) recent study on students' mobile phone activities in the classroom, smartphone/mobile phone distracts students learning process and it is believed that their classroom learning is also disrupted during texting.

According to Elder (2013), recent study students who used smartphone/mobile phone while in classroom score lower than students who did not use smartphone/mobile phone and it's observed that the students may not even recall much information from the lecture. Students who use smartphone/mobile phones during classroom do not pay attention to their class teacher/lecturer as they are spending too much time chatting and texting. According to Hanson et al. (2011), students prefer to use instant messaging, web-surfing and email in the library rather than looking into library resources online. Alfawareh and Jusoh (2014), stated that students don't make good use of their smartphones for learning motives but utilize it to take pictures, browse the internet, making calls and Facebooking or Instagram.

However, some adolescents are having a lot of challenges balancing their study life with their need for social support although some of them wants to make their learning as a

priority. They seem to be motivated on updating their Facebook status rather than browsing for materials that will aid them in their subject assignment. According to Abu-Shanab (2015), using the smartphone for a long period could affect an individual's health as it could result in headache and constant calls and messages can lead to interruption on adolescents/student's concentration and focus on completing their subject coursework which could be negatively affected in their academic.

Smartphone addiction could also be associated with life satisfaction through academic performance which literally shows that students who achieve low academic performance will be more likely to experience less life satisfaction and they are likely to be disposed to smartphone addiction.

2.3 Impact of Smartphone on Social life

Technology is changing very rapidly as communication plays a very important role in human life. communication is now becoming easier with the development of technology and influences the communication style between the communicators and with the advanced and unique features of the smartphone make it totally different from every other phone.

According to Kuss & Griffiths (2011), the social engagement between adolescents is jeopardized with the advanced unique feature application by limiting their face-to-face interaction and this could cause real-life social interaction which contribute to relationship issues to arise and also interference in adolescents in academic work.

According to a recent study in Chicago (Patton, Eschmann, Elsaesser & Bocanegra,2016), the youth and adolescent use the social media networking site such as Facebook, Instagram etc to brag about violence, recruit gang members, make threats and plan criminal activity known as internet banging.

It has become obvious that the adolescents who used social networking more and some who were more emotionally invested in social media due to experienced poorer sleep quality, higher levels of anxiety, depression and lower self-esteem.

However, it can be seen that adolescents are investing most of their time smartphone screen chatting and thereby engaging more in social media than studying or face-to-face interactions. It's true that the application of smartphone device increases the ability to interact with social mates easily and freely but it could pose a lot of danger on human relationship.

2.4 Impact of Smartphone on Psychological Health

smartphone usage could lead to development of certain behavioural and mental issues. The adolescents have so much attachment to their smartphone and this made some of them feel they cannot live without having their smartphone within.

According to APA (2002), the youth and adolescents spend 6 to 8 hours per day on social media. The social media has been seen as a double-edged sword which both positive and negative impacts on youth and adolescents. Muduli (2014), stated that

adolescents get weak in real-life skills because it takes them away from reality, decreases interpersonal interactions, increases anxiety levels wanting to achieve unimaginable game targets distracts them from the study, helps them to live in fantasy alters their lifestyle, causes addiction and psychiatric disorders as depression, attention deficit disorder, obsessive-compulsive disorder and bipolar disorder.

Kim (2013) stated that adolescents tend to depend so much on their smartphone than studying as they tend to surf the internet and play online games as a way to eliminate their mental stress from the stress experienced as a way to escape from their school work. Adolescents are now depending more on their smartphone due to the easy accessibility of internet.

3.0 Research Design and Methodology

The method of study adopted by the researcher for the present study is the survey method. It is one of the most commonly used study approaches. Survey study approach goes beyond data gathering and tabulation of data. Perhaps, there is no straight forward way of finding out what people feel, do and think than by asking them directly and because of this reason the survey method was selected to represent an important research method. The survey data collection method involves the classification, interpretation, application and elevation towards a proper understanding and solution of the challenges.

During this research work, the researcher distributed questionnaires randomly to the participant at various places like FTMSGlobal College Malaysia, via Social media (Facebook, LinkedIn and WhatsApp), Canberra Institute of Technology Australia, in order to collect data from the participants. A total sample of 100 participants was chosen for this research study. Random the sampling process was followed during the data collection and this sample was random in the sense that the participants were randomly selected from various institutions, social media. The out of one hundred (100) questionnaires which were distributed to the participants, eighty (80) participants responded and were returned while twenty (20) participants could not participate and were not returned.

Descriptive statistics was used during the data analysis of the findings. The participant responses were analysed using simple percentages and information were draw based on the answered research questions.
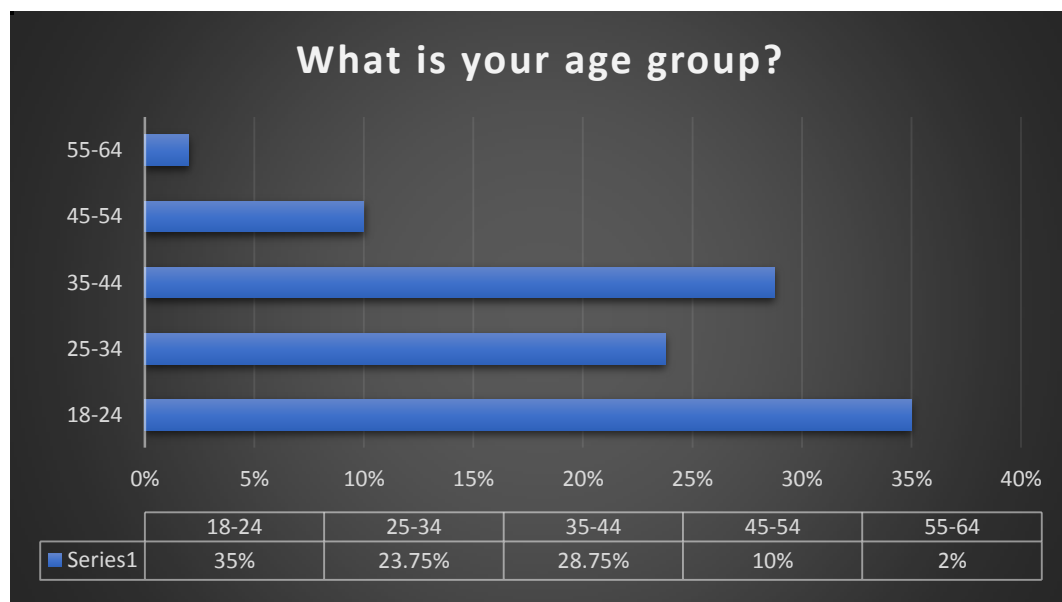
4.0 Results and Discussion

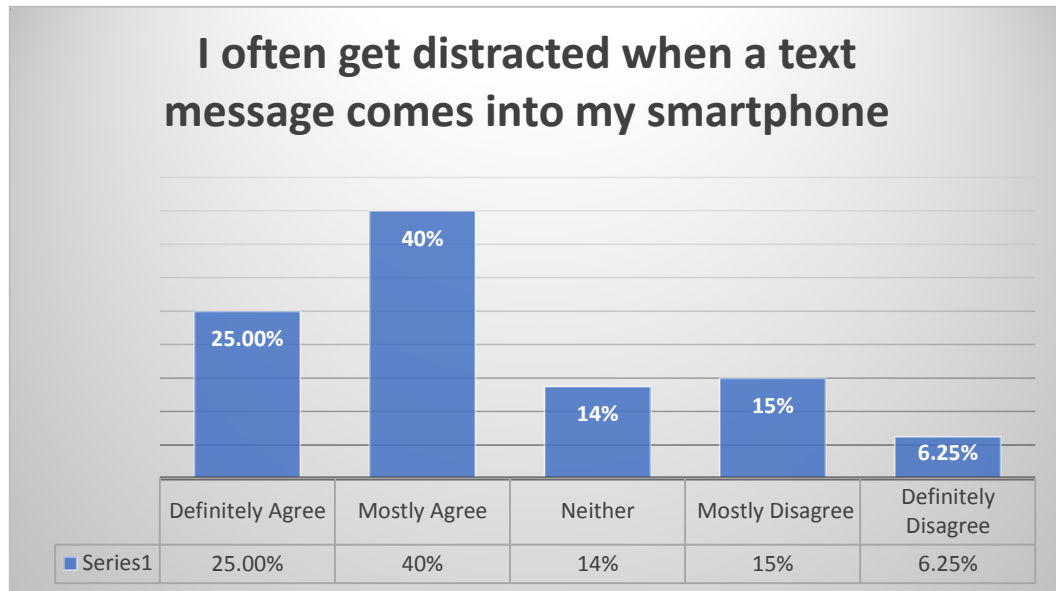| Question 1: What is your gender?		
Male	46	57.5%
Female	34	42.5%
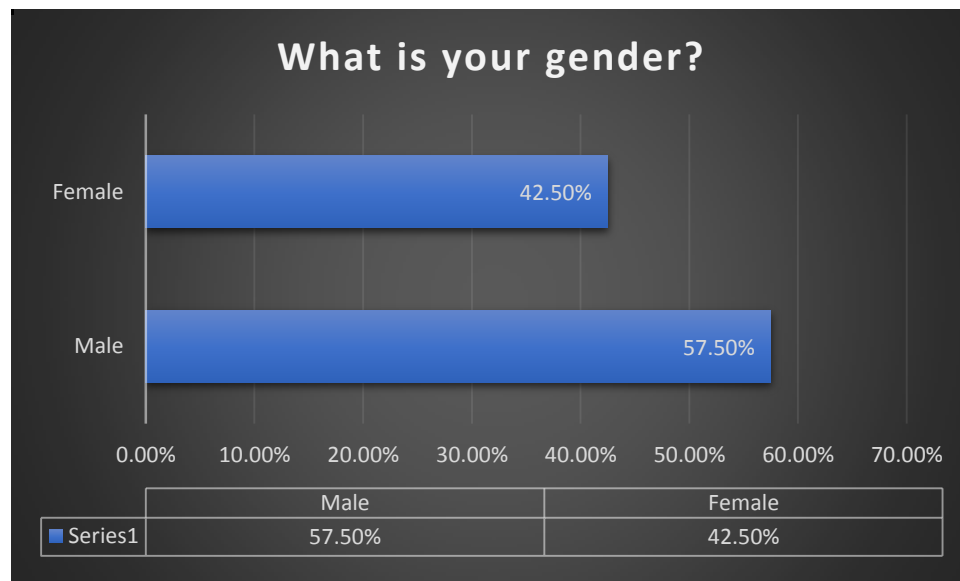
It is evident that 57.50% of male participated in the survey while 42.50% of the female also participated as females to the survey.

| Question 2: What is your age group?		
18-24	28	35%
25-34	19	23.75%
35-44	23	28.75%
45-54	8	10%
55-64	2	2.5%
Grand total	**80**	**100**

The table above shows that 35% of respondents were within the age group of 18-25, 23.75% were within the age group of 25-34, 28.75% were within the age group of 35-44, 10% were within the age group of 45-54 and 2% were within the age group of 55-64. It is an indication that all age group had the opportunity to participate during the survey.

Question 3: I often get distracted when a text message comes into my smartphone		
Definitely Agree	23	28.75%
Mostly Agree	32	40%
Neither	16	20%
Mostly Disagree	8	10%
Definitely Disagree	1	1.25%
Grand total	**80**	**100**

I often get distracted when a text message comes into my smartphone

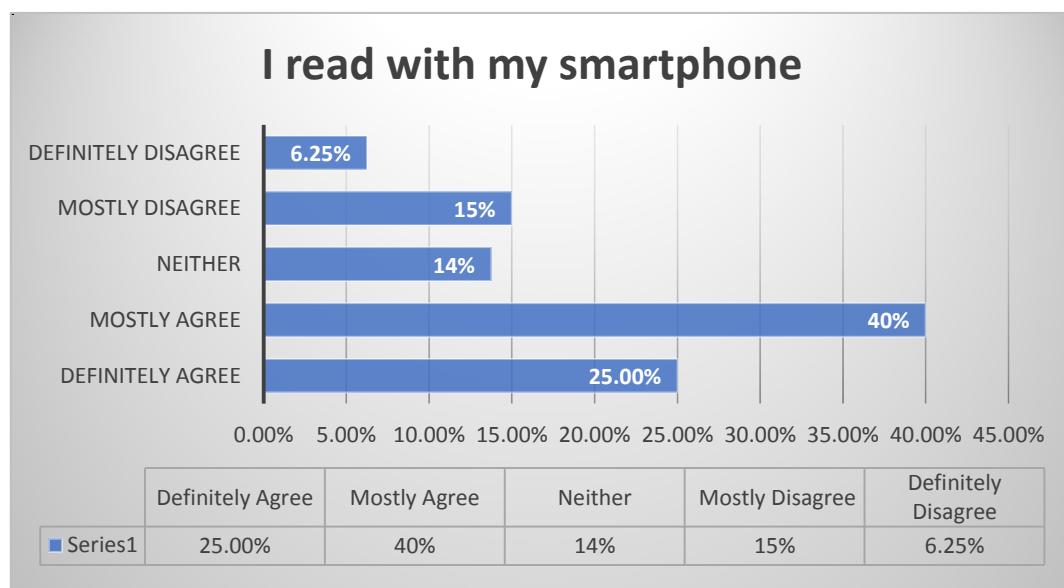|	Definitely Agree	Mostly Agree	Neither	Mostly Disagree	Definitely Disagree
■ Series1	25.00%	40%	14%	15%	6.25%

The table above is used to find out how distracted participants can be when there is a notification of text messages on their smartphone or cell phones. The results from the survey show that 25% of participants definitely agreed and 40% of participants responded mostly agreed, 14% of participants neither agreed, 15% participants mostly disagreed and 6.25% of the participants definitely disagreed. The survey result actually shows that people get distracted when there is a notification of text messages on their smartphone devices.

Question 4: I am addicted to my smartphone		
Definitely Agree	20	25%
Mostly Agree	28	35%
Neither	13	16.25%
Mostly Disagree	12	15%
Definitely Disagree	7	8.75%
Grand total	**80**	**100**

I am addicted to my smartphone

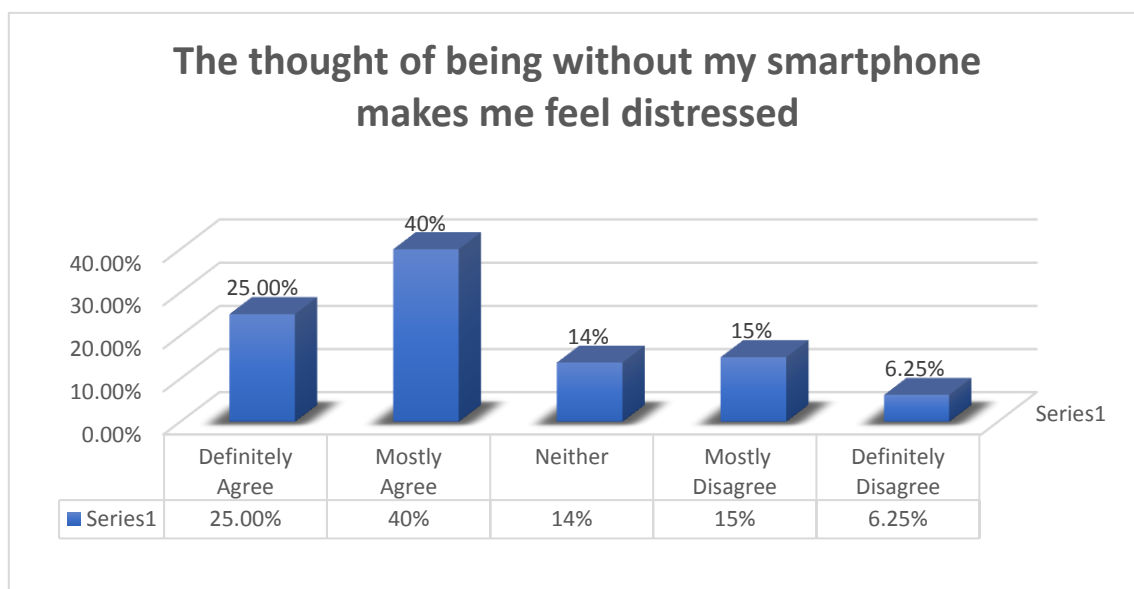|	Definitely Agree	Mostly Agree	Neither	Mostly Disagree	Definitely Disagree
■ Series1	25.00%	40%	14%	15%	6.25%
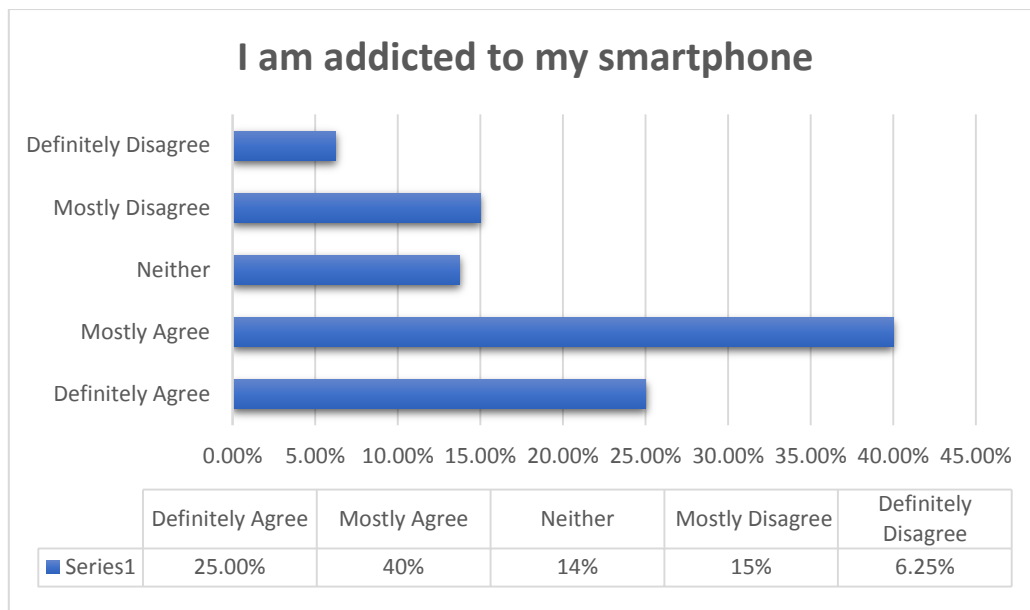
The survey question above was asked just to know the smartphone addictive and participants do respond respectively to it. The 25% of participants definitely agreed to smartphone addictive, 40% of participants mostly agreed, 14% of participants neither agreed, 15% participants mostly disagreed while 6.25% participants definitely disagreed. The survey results show that participants/people are becoming addicted to their smartphones.

Question 5: I read with my smartphone		
Definitely Agree	19	23.75%
Mostly Agree	25	31.25%
Neither	20	25%
Mostly Disagree	10	12.5%
Definitely Disagree	6	7.5%
Grand total	**80**	**100**

I read with my smartphone

	Definitely Agree	Mostly Agree	Neither	Mostly Disagree	Definitely Disagree
■ Series1	25.00%	40%	14%	15%	6.25%

The table above is used to know the number of people who read with their smartphone. The survey result shows that 25% of participants definitely agreed to read with their smartphone, 40% of participants mostly agreed to use their smartphone for study, 14% participants neither agreed to use their smartphone for study, 15% of participants mostly disagreed to study with their smartphone and 6.25% participants definitely disagreed to study with their smartphone.

Question 6: The thought of being without my smartphone makes me feel distressed		
Definitely Agree	20	25%
Mostly Agree	32	40%
Neither	11	13.75%
Mostly Disagree	12	15%
Definitely Disagree	5	6.25%
Grand total	**80**	**100**

The table above shows that 25% of participants definitely agreed to have to be in distressed without their smartphone, 40% of participants mostly agreed to it, 14% participants neither agreed nor disagreed, 15% participants mostly disagreed and 6.25% definitely disagreed. It results shows that people are also distressed whenever they are far away from their smartphone device.

5.0 Conclusion and recommendations

The results of the questionnaire so far has revealed that smartphone device on the adolescents is really on the negative parts as students are no longer keen to read their books. The smartphone industry is also growing every day and more applications and advanced features are being implemented or yet to be implemented. There is an urgent need for governments to have a smartphone policy on the adolescent's usage while undertaking their studies. Yes, it's a fact that smartphone devices could help individuals in so many ways such as quick access to information but that is not enough reason to risk the fact that it is causing a lot of havoc to the educational system.

References

1. Abu-shanab, E. (2015). The Influence of Smart Phones on Human Health and Behavior : Jordanians' Perceptions. International Journal of Computer Networks and Applications, 2(2), 52-56

2. Alfawareh, H. M., & Jusoh, S. (2014). Smartphones usage among university students: Najran University case. International J. of Academic Research, 6(2), 321-326. https://doi.org/0.7813/2075-4124.2014/6-2/B.48

3. Anderson, K. E. (2016). Getting acquainted with social networks and apps: Instagram's instant appeal. Library Hi Tech News, 33(3), 11-15. https://doi.org/10.1108/LHTN-03-2016-0011

4. American College Health Association, National College Health Assessment (ACHA-NCHA), Web Summary, 2006. Available at http://www.acha-ncha.org/data_highlights.html

5. APA. (2002). THE AMERICAN PSYCHOLOGICAL ASSOCIATION report 2002

6. Cochrane, T. D. (2010). Beyond the Yellow Brick Road: mobile Web 2.0 informing a new institutional e-learning strategy. ALT-J, 18(3), 221-231. https://doi.org/10.1080/09687769.2010.529110.

7. Elder, A. D. (2013). College students' cell phone use, beliefs, and effects on their learning. College Student Journal, 47(4), 585-592. Retrieved from http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=27&sid=a3638b70-b6d0-4808-8f815018d1658798%40sessionmgr115&hid=107

8. Froese, A. D., Carpenter, C. N., Inman, D. A., Schooley, J. R., Barnes, R. B., Brecht, P. W., & Chacon, J. D.(2012). Effects of classroom cell phone use on expected and actual learning. College Student Journal,46(2),323-332.Retrieved from http://web.a.ebscohost.com/ehost/pdfviewer?vid=5&sid=c47a113c-266f-4e8a9da84c55fc6c2d2f%40sessionmgr4001&hid=4106

9. Rambitan, V. M. M. (2015). The Effect of Smartphone on Students' Critical Thinking Skill in Relation to the Concept of Biodiversity. American Journal of Educational Research, 3(2), 243-249.

10. Rung, A., Warnke, F., & Mattheos, N. (2014). Investigating the Use of Smartphones for Learning Purposes by Australian Dental Students. JMIR mHealth uHealth, 2(2). Retrieved from http://mhealth.jmir.org/2014/2/e20/

11. Radiation and Nuclear Safety Authority Accessed on 29th September 2019 via https://doctor.ndtv.com/living-healthy/5-negative-effects-from-your-cellphone-to-your-brain-1723696

12. Hanson, T. L., Drumheller, K., Mallard, J., McKee, C., & Schlegel, P. (2011). Cell phones, text messaging, and Facebook: Competing time demands of today's college students. College Teaching, 59(1), 23-30. https://doi.org/10.1080/87567555.489078

13. Kim, H. (2013). Exercise rehabilitation for Smartphone addiction. J Exer Rehab, 9, 500-505.

14. Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction—a review of the psychological literature. International journal of environmental research and public health, 8(9), 3528-3552.

15.   Muduli, J. R. (2014). Addiction to Technological Gadgets and Its Impact on Health and Lifestyle: A. Study on College Students. National Institute of Technology, Rourkela, India

16.   Patton, D. U., Eschmann, R. D., Elsaesser, C., & Bocanegra, E. (2016). Sticks, stones and Facebook accounts: What violence outreach workers know about social media and urban-based gang. violence in Chicago. Computers in Human Behaviour, 65, 591-600

17.   Skierkowski, D., & Wood, R. M. (2011). To text or not to text? The importance of text messaging among college-aged youth. Computers in Human Behavior, 28(2), 744-756

18.   https://www.sciencenewsforstudents.org/sites/default/files/scaldimage/860_phones_in_classroom.png (Accessed on 29th September 2019)

19.   World Health Organization. Electromagnetic Fields and Public Health: Mobile Phones. Available online: http://www.who.int/en/news-room/fact-sheets/detail/electromagnetic-fields-and-public-health-mobi   le-phones (accessed on 27 September 2019).

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