

A Study on Impact of Smart-phone usage on Academic Performance of Upper Primary Students in Delhi

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ABSTRACT

The smartphone in the hands of teenager has become a normal global phenomenon in the age of mobile revolution. It is being allowed by the parents and schools as well today thinking that this would give ample scope of extensive learning through easily available study materials, easy accessibility of classes and lectures. Smartphone has become an integral part of adolescents' routine with the scope of providing them information, preferred means of communication, and box of entertainment in their hand and has turned as a social tool from the technological tool. The study is concerned to assess the usability of smartphone by the students of upper primary standards in the region of Delhi. It investigates the frequency of the use of smartphone by the students and its impact on their academic performance

Keywords

Smartphone, Technology, Teenager, Academic Performance, School

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Introduction

In the age of globalisation and technological inventions, smartphone has become need of the time rather than want. There had been various gadgets for communication, information and entertainment from time to time with possible improvements which eased the life on the planet. Initially the mobile phones were not smart as its functions were limited to communication and some basic characteristics. Now, it has been developed as smart communinfotenment device which is being used in smartest way by teenagers these days. It has become integral part of adolescents' life and is being extensively used by students in the wake of educational and information seeking purpose, but there has been dilemma among the people regarding its impact over teenage students. Obviously, use of smartphone is bringing much changes in the overall performance and behavioural mechanism of teenager students (Kibona and Mgaya, 2015), but claiming the gadget for having only negative impact would be injustice and premature to conclude about. It is often said that smartphone and social media are driving our children (mainly teenagers) unsocial in practical, abnormally craving, indolent, lonely, adultery prone, and towards behavioural degradation as well. Various reports and studies are revealing that smartphone should be blamed for increasing mental-psychological health like depression among the teenagers, but there is no concrete evidence to conclude that use of smartphone and social media should be blamed for the cause. There has been misplacement of our fear, as deleterious effect is not evident on mental health of children's psychology as claimed by a study (Odgers, 2018). Various research based on data collected from the students reflect that usually there has not been found significant association between time spent on smartphone and mental health for most teens. In Indian context, it is important to mention that approximately 9 out of 10 teenager students are using smartphone and almost half of them remain continuously online. Pew Research Centre in an observation based on survey reveals that among

teens are addicted of most popular social media platform such as Facebook, Instagram, Youtube, and Snapchat (Anderson & Jiang, 2018) which certainly has greater influence on teen's psychology.

Literature Review

Use of smartphone and its impact on teenager students has not gathered attention in Indian society and academic community to research on but is being recognized as an issue of study across the globe. There are few significant studies on accessing the impact of smartphone which would certainly give a clear roadmap to move on. S. Nawaz & Z. Ahmed (2012) conducted a study on Statistical Study of Impact of Mobile on Student's Life based on 500 samples collected by stratified random sampling and concluded that male teenagers are more prone to use smartphone than female teenagers. He also found that the use of mobile phones does not have negative impact, rather it has more positive outcomes. Though the study was conducted 8 years ago, certainly the new features in smartphone may have caused some surprising impacts which will limit the result of the study as vertical gap. Sumathi, Lakshmi and Kundhavai (2018) in their study titled Reviewing the Impact of Smartphone Usage on Academic Performance among Students of Higher Learning concluded that there is no significant relationship affecting the academic performance of students in using smartphones. North, Johnston and Ophoff (2014) conducted their survey on the use and contribution of smartphones among the students of South African university. The study tried to find out the reasons to use mobile phones, pattern of mobile phone use, purchasing factors and behaviour-related issues. The survey revealed that the smartphones have increased the addiction. Nayak (2018) in his study concluded that performance of the students is largely affected by smartphones. M. J. Stollak, et al. (2011) in their study found that students who have smartphones were more habituated of accessing social networks and spending time in chatting. From an

educational point of view, student can enhance their academic performance level by watching online resources and professors may have to be wary of assigning project works involving social media to students as some may have an advantage in completing the work than others.

Methodology

The study is descriptive in nature and partially exploratory as well based on mainly primary data however, the secondary data have also been used on several fronts. It investigates the extent of impact of the smartphone use over students in India with special reference to the region of Delhi. The study has been conducted among the population of teenager students of class 6th to 9th (upper primary students) of Delhi, India. Multistage sampling has been used to collect data. The samples were selected from government and private schools adopting purposive sampling and questionnaires were distributed among the students of 6th standard to 9th standard randomly. The data was collected also through schedule method from the students of class 6th and 7th considering that they might not be able to answer accurately the set of questions. Total 190 questionnaires were administered 95 to each the private and public sectors school students. The reliability of the responses collected have been checked through test-retest method on 20 responses out of 169 usable responses. Out of total collected response 130 respondents found using smartphone. The data collected has been analysed using correlation analysis and regression analysis to reach the inferences. Besides, the descriptive statistics and graphical presentation also accompany the interpretation of the results.

Result and Discussion

The preliminary assessment of the collected data reveals that 77 percent students have smartphone with internet connectivity of which 100 percent of them have been found surfing internet and browsing. Also, of the total using smartphone with internet connectivity 73 percent students have 3rd Generation (3-G) connectivity, whereas remaining 27 percent have been found using 2nd Generation (2-G) connections. Table 1 and Figure 1 clearly shows the ratio of teen students using smartphone with internet connectivity, 3-G internet connectivity, smartphone use among the teen students of public sector school and private sector school etc.

Table 1: Ratio Related to Smart Phone Usage among Teens in Delhi

Smartphone Usage	Public School	Private School
Response Collected	53 %	47 %
Smart Phone Users	67 %	33 %
Internet Connectivity	100 %	100 %
3-G Internet Connectivity	80 %	58 %
2-G Internet Connectivity	20 %	42 %

The table reveals that response of the government schools' teens to the questionnaire administered are less (47%) than the response rate (53%) of the private schools' teens. It also reflects that students of both the private schools and government schools possess 100 percent internet connectivity on their smartphone handset. Among the students of private schools 80 percent have been found using 3-G connectivity where as only 58 percent students found using 3-G connectivity. It simply shows that the use of smartphone among the students of private schools is higher as compared to those who are from government school. The students were also asked about the frequency of the smartphone usage viz. average total time spent on smartphone which is reflected in Table 2.

Table 2: Average Time Spent on the Use of Smartphone Per Day

Hours Spent	Frequency	Percentage	Cumulative Percentage
Less than 2 Hours	14	10.77 %	10.77 %
2 Hours to 4 Hours	27	20.77 %	31.54 %
5 Hours to 6 Hours	34	26.15 %	57.69 %
7 Hours to 8 Hours	32	24.62 %	82.30 %
More than 8 Hours	23	17.69 %	100.00 %
	130	100.00 %	

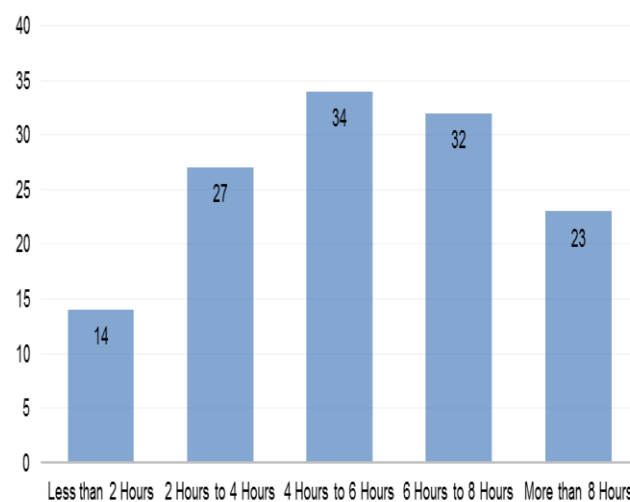


Figure 1: Frequency of the Smartphone Usage

The students were asked about the use of the smartphone regarding purpose on academic front including downloading study material, email, browsing knowledge portal, attending classes, and non-academic front including online gaming, access of social media etc. and following inferences have been made.

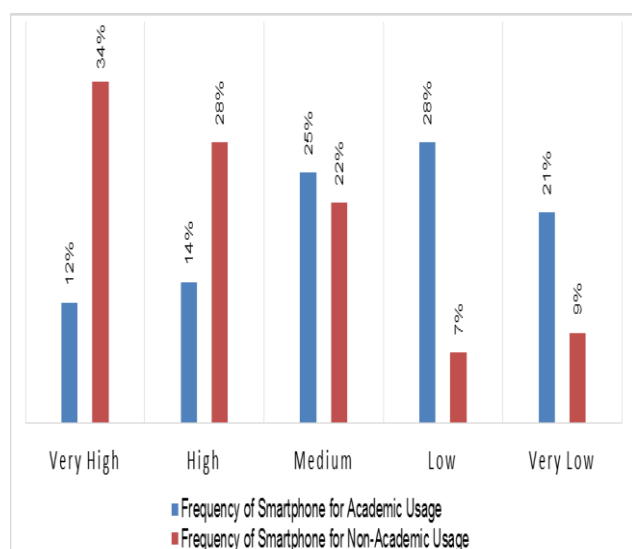


Figure 2: Frequency of Smartphone Usage for Academic & Non-Academic Purposes

It is evident from Figure 2 that the frequency of usage of smartphone among the students (teenager) is greater for the non-academic purpose than the academic purpose. However, they were further asked about their satisfaction level on the use of smartphone helping them out in study material assessment, their preference towards use of online books, dependence on physical library, and their perception about the impact of excessive use of smartphone on the marks they obtained.

Table 3: Frequency of Smartphone Usage for Academic & Non-Academic Purposes

Frequency of Smartphone Usage	No.	Easy Access to Study Material	No.	Less Dependence on Physical Books	No.	Preference of Studying from Online Books	No.	Marks they Obtained in their Class	No.
V.H.	23	S.A.	79	V.H.	37	V.H.	41	V.H.	14
H.	32	A.	34	H.	42	H.	46	H.	34
M.	34	N.	17	M.	13	M.	31	M.	41
L.	27	D.	0	L.	21	L.	07	L.	34
V.L.	14	S.D.	0	V.L.	17	V.L.	05	V.L.	07

It is being reflected by Table 3 that more than 85 percent users strongly believe that smartphone is helpful in accessing study material whereas non were disagree. More than 65 percent of the students prefer to study via online books or sources, on the contrary more than 60 percent of the teens have been found not preferring physical books for study.

Table 4: Descriptive Statistics

Parameter	Response Variable	Explanatory Variable
Variable Count	130	130
Mean	71.2000	5.8115
Standard Deviation	11.8566	2.8910
Minimum	40.0000	1.0000
Maximum	91.0000	14.0000

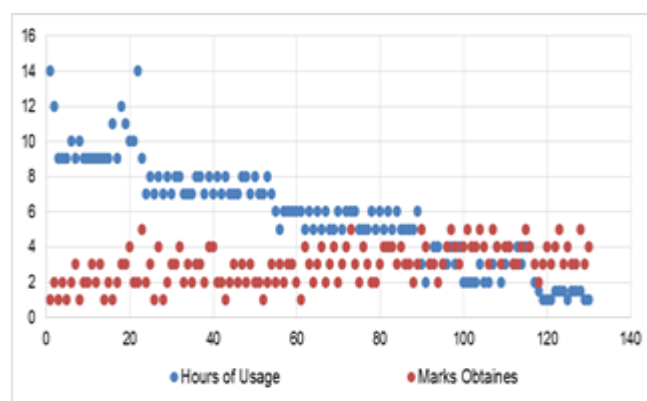


Figure 3: Hours of Usage Vis-à-vis Marks Obtained by the Teenage Students

Figure 3 reveals that there is inverse relationship among the frequency of smartphone usage and the academic performance. Further, to validate and confirm the nature and direction relationship among the two variables correlation analysis has been done, the result of which is depicted in table 5.

Table 5: Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	Marks Obtained		
Independent Variable	Frequency of Smartphone Usage		
Intercept	91.3255	Row Processed	130
Slope	-3.4630	Sum of Frequencies	130
R-Squared	0.7130	Sum of Weights	130.0000
Correlation	-0.8444	Coefficient of Variation	0.0896
Mean Square Error	40.66603	Square Root of MSE	6.376992

The equation of the straight-line relating Marks Obtained and Frequency of Smartphone Usage is estimated as: Marks Obtained = (91.3255) + (-3.4630) Frequency of Smartphone Usage using the 130 observations in this dataset. The y-intercept, the estimated value of Marks Obtained when Frequency of Smartphone Usage is zero, is 91.3255 with a standard error of 1.2597. The slope, the estimated change in Marks Obtained per unit change in Frequency of Smartphone Usage, is -3.4630 with a standard error of 0.1942. The value of R-Squared, the proportion of the variation in Marks Obtained that can be accounted for by variation in Frequency of Smartphone Usage, is 0.7130. The correlation between Marks Obtained and Frequency of Smartphone Usage is -0.8444.

Table 6: Regression Estimation

Parameter	Intercept	Slope
Regression Coefficients	91.3255	-3.4630
Lower 95% Confidence Limit	88.8331	-3.8473
Upper 95% Confidence Limit	93.8179	-3.0787
Standard Error	1.2597	0.1942
Standardized Coefficient	0.0000	-0.8444
T Value	72.5003	-17.8310
Prob Level (T Test)	0.0000	0.0000
Reject H0 (Alpha = 0.0500)	Yes	Yes
Power (Alpha = 0.0500)	1.0000	1.0000
Regression of Y on X	91.3255	-3.4630
Inverse Regression from X on Y	99.4277	-4.8572
Orthogonal Regression of Y and X	98.9660	-4.7777

Conclusion

The study is significant from viewpoint of the smartphone usage among the teenage students of Delhi enrolled in upper primary classes i.e., those of class 6 to class 9. From the preliminary information assessment of responses, it has been found that 100 percent students with smartphone have internet connectivity however, those enrolled in private schools are more prone to the use of smartphone with high-speed internet. More than 65 percent of the students are using smartphone accessing internet on an average 5 hours to 8 hours a day. The study reveals that the students have become more dependent on online sources as compared to the physical sources and study materials, but their purpose of using smartphone, surfing and browsing have been found not surprising, as most of them are spending maximum time on non-academic purpose which includes playing online games, watching videos, and spending time on social media. The most significant part of the study therefore reflects that there exists inverse relationship among the frequency of smartphone use by the teenage students in the region of Delhi and their academic score. Hence, considering that the students consider smartphone as better platform for academic purpose as they believe it provides more easily accessible study materials and that they prefer to study through online resources, still not using the gadget for academic purpose by majority of them makes it contradictory and serious issue. Therefore, it is suggested that the students of teenage should be provided with various academic portals containing video lectures, portable document file stuffs, and audio visual graphic explanatory stuffs to create interest among them. Simultaneously, regular monitoring by the guardians and teacher are suggested on serious note. This will result in enhancing the performance of the teenage students.

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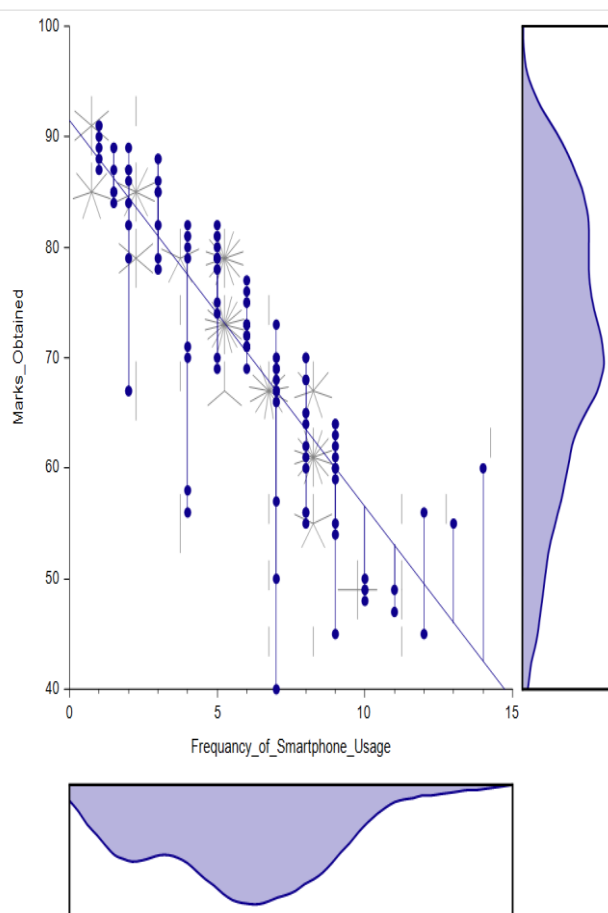


Figure 4: Linear Regression Plot – Frequency of Smartphone Usage vis-à-vis. Academic Performance of the Students

Table 6 reveals the regression result. A significance test that the slope is zero resulted in a t-value of -17.8310. The significance level of this t-test is 0.0000. Since $0.0000 < 0.0500$, the hypothesis that the slope is zero is rejected. The estimated slope is -3.4630. The lower limit of the 95% confidence interval for the slope is -3.8473 and the upper limit is -3.0787. The estimated intercept is 91.3255. The lower limit of the 95% confidence interval for the intercept is 88.8331 and the upper limit is 93.8179.

It is evident from Figure 4 that higher frequency of the smartphone usage hours has negative impact on the academic performance being reflected by marks obtained as the regression slop is declining down from left to right and the bubbles are concentrated along the r line. The density plot and sunflower plot demonstrate the higher frequency zone along x axis and y axis and has been found that frequency of smartphone usage among the students are mostly ranging around 5 hours to 10 hours which high. It also depicts that the academic performance is getting down with the higher frequency of the smartphone use.

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