

### Revealing the Relationship between Smartphone Addiction and Academic Performance of Students: Evidences from Higher Educational Institutes of Pakistan

Khan, Arooba Azam; Khalid, Asma; Iqbal, Rimsha

Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

#### Empfohlene Zitierung / Suggested Citation:

Khan, A. A., Khalid, A., & Iqbal, R. (2019). Revealing the Relationship between Smartphone Addiction and Academic Performance of Students: Evidences from Higher Educational Institutes of Pakistan. *Pakistan Administrative Review*, 3(2), 74-83. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-63203-4>

#### Nutzungsbedingungen:

Dieser Text wird unter einer CC BY Lizenz (Namensnennung) zur Verfügung gestellt. Nähere Auskünfte zu den CC-Lizenzen finden Sie hier: <https://creativecommons.org/licenses/by/4.0/deed.de>

#### Terms of use:

This document is made available under a CC BY Licence (Attribution). For more information see: <https://creativecommons.org/licenses/by/4.0>

# Revealing the Relationship between Smartphone Addiction and Academic Performance of Students: Evidences from Higher Educational Institutes of Pakistan.

## Arooba Azam Khan

Department of Public Administration  
Fatima Jinnah Women University  
[arooba.azam93@gmail.com](mailto:arooba.azam93@gmail.com)

## Dr. Asma Khalid

Assistant Professor  
Department of Public Administration  
[asmakhalid@fjwu.edu.pk](mailto:asmakhalid@fjwu.edu.pk)

## Ms. Rimsha Iqbal

Associate Lecturer  
Department of Public Administration  
Fatima Jinnah Women University  
[rimshaiqbal@fjwu.edu.pk](mailto:rimshaiqbal@fjwu.edu.pk)

**Abstract:** In this world of technology, smart phone has become a vital part in everyone's life. This study aims to focus on the relationship between smartphone addiction and academic performance of students in higher education. Variables such as use of social networking sites, overuse of smart phone and Academic Performance (Grade Point Average and Time Management skills) were part of this research. Self-administered questionnaire was used to collect data from 360 students of two private universities in Rawalpindi, Pakistan. The target age group was 19-24 studying in Bachelors degree program. Data was analyzed through SPSS. Pearson correlation and multiple linear regression tests were applied. Results reveal that there is a negative relationship between smartphone addiction and academic performance. Moreover, it has been proved that students with good time management skills achieve high grades/GPAs than those who have poor time management skills due to involvement in different social networks (media) such as Facebook, Twitter and Instagram etc. It is suggested that students should spend their time wisely and use their smartphones for educational purposes. However, students need training, counseling and close monitoring to get benefits through smartphones' use.

**Keywords:** Smartphone Addiction, Facebook, Twitter, Academic Performance, Time Management Skills, Students, Higher Education.

**Reference:** Reference to this article should be made as: Khan, A. A., Khalid, A., & Iqbal, R. (2019). Revealing the relationship between Smartphone addiction and academic performance of students: Evidences from higher educational institutes of Pakistan. *Pakistan Administrative Review*, 3(2), 74-83.

## 1. Introduction

Smartphone is a device that helps to connect one individual to another. It has become so common in the past few years that people can't imagine their lives without it especially youngsters (Bianchi & Phillips, 2005). Smartphone addiction can be defined as "individuals

spending most of their time in scrolling, watching, liking, commenting, stalking and talking to their friends through different mobile applications” (Li, Lepp & Barkley, 2015, p. 452). According to Vogels (Mobile Developer Evangelist at Yahoo), people spend 19% time on Facebook, 17 % on entertainment (particularly on YouTube), 15% in gaming, 10% in browsing and 8% in utility, 2% in news, 4% in productivity and 10% on other applications (Vogels, 2017).

Researchers, around the globe, studied students’ perspective about smartphone addiction and found that smartphones entertain students and help them to escape from academic pressure. Students usually use smartphones for self-expression and to maintain their social relations (Albarashdi et al., 2016). On the other side, it has also been found that in some cases, students use smartphone apps for their academic work. It is further added that availability of low price packages of internet, instant messages and calls are important reasons of youth attraction towards smartphones in Pakistan (Kamran, 2010).

Research has shown that smartphone addiction does create a very strong impact on academic performance of youth. Several studies have been conducted to measure the impact of smartphone addiction and academic performance among university students. Alosaimi et al. (2016) and Aljomaa et al. (2016) studies conclude that smartphone addiction creates negative impacts on students’ academic performance. Most of the students suffer disturbance in sleep, lack of energy and exercise, bad eating habits, obesity, and poor academic performance.

Youth is extremely victimized by smartphones. It has been observed that youth spend most of their time on smartphones. Youth’s diversion of attention and lack of time management towards studies cause them to lose their grade point average (GPA) (Jumoke, Oloruntoba & Blessing, 2015). Moreover, Aljomaa et al. (2016) argued that misuse of smartphone leads to smartphone addiction and students’ dependency on the phones creates negative impact on their personal, social and academic lives. The researcher stated, in his article for future researchers that to examine or explore the relationship of smartphone addiction with academic achievement, traffic accidents and other psychological factors. Therefore, taking this opportunity as a gap the present study focuses on the relationship between smartphone addiction and academic performance among private university students. The objective of present study is to determine the relationship between smartphone addiction and academic performance (GPAs and time management skills as sub-variable to measure academic performance) among university students. The study further determines the impact of social networking sites (SNS) and overuse of smartphone on academic performance of students pursuing higher education (bachelor degree program).

## **2. Literature Review**

Several studies offer explanation of smartphones usage and its impacts on the lives of people in general and on youth in specific. For example, Roos (2001) argues that mobile phone addiction can be defined as dependency on your device. People who are addicted to their phones use their phones everywhere, even when they have facility of landline in their houses. Thus, excessive mobile phone usage leads to financial and social difficulties.

Furthermore, Wallace (2014) in a study argued that addiction to the digital world by excessive usage of mobile phone has drastic consequences. The scholar further revealed that young people suffer from health consequences due to less sleep, as they stay up late to check for social network status updates, to chat online and to reach the next game levels. Moreover, numerous tragic cases due to misuse of smartphone have also grabbed headlines and deepened the public's concerns about excessive and unnecessary internet and smartphone usage.

A research in Bangladesh shows opposite results as compared to previous discussion. Result showed that there is no relationship exists between student academic performance and social

networking sites (SNS) usage because students managed to maintain their performance in studies (Mouri & Ali, 2016).

Similarly, another study in a college found that students actually gain knowledge through Twitter; it not only helps them to increase their social engagement but also boost their grades (Junco, Heiberger & Loken, 2011).

However, mostly researchers agreed that usage of smartphones creates problems for youth (Bianchi & Leung, 2015). Bianchi and Phillips (2005) stated in their research that youngsters feel absentminded, nervous, and unhappy. They further argued that youth usually hide themselves from their loved ones because of smartphone addiction.

### ***2.1 Overuse of Smartphone***

Nehra et al. (2012) conducted a research in India with graduate and post-graduate students to measure mobile phone use pattern and how it effects on individual's behavior. Results show that 2/3 youngsters of the total sample use their phones to boost up their moods, 40% youngsters use their phones to run from their problems. In this regard, research shows that overuse of mobile phones leads to very serious psychological problems like anxiety, depression, frustration and even lack of sleep. Another study was conducted to find out the link between smartphone addiction and psychological attributes among Chinese students. Results revealed that lonely people are the regular users of mobile phones. Chinese students interest level in mobile phones creates a negative effect on productivity. Shy people lose their control in time management as they spend most of their time in their mobile phones. Moreover, their social interaction decreases to some extent. Lepp, Barkley and Karpinski (2015) conducted a research on the measurement of smartphone usage and GPAs of college students. The analysis shows that significant inverse association exists between high usage of smartphone and students' GPAs. Students, who spend their time on smartphone more, have poor GPA as compared to those who spend more time on studies.

### ***2.2 Member of SNS***

Kirschner and Karpinski (2010) research shows that Facebook (FB) actually creates negative impact on students' academic performance. Facebook users preferred to spend their time on Facebook to maintain their social interaction. This affects students' grades. On the other hand, non-users of FB are focused on their studies so they score high grades. Study by Paul, Baker and Cochran (2012) shows that there was a negative impact of online SNS on academic performance. Students use SNS for the sake of entertainment, they don't have any intentions to use SNS for academic purpose (Jumoke et al., 2015).

### ***2.3 GPA***

Wentworth and Middleton (2014) conducted a research on college students to explore the association between usage of smartphone and academic performance through GPA, SAT marks, study period and forecast course grade with respect to role of gender and employment status. Results showed that students tend to use their smartphones more than 2 hours per week, send average 30 messages per day and spend more than five hours on their laptops and computer. As a result, this routine of overuse of technology ultimately affects their academic performance. The high usage of computer causes negative impact on their GPAs; however, no association was found between their daily call time and their times spend on social networking sites on their GPA. There exists a difference of gender on scoring high SAT marks as it has been observed that unlike males, females are more likely to work harder to get high scores.

### **2.4 Time Management Skills**

Zulauf and Gortner (1999) conducted a study to check impact of time management and academic performance of college students. Result shows that good time management skills improve the grades while low time management skill leads to low grades. It depends on students how they prefer to manage their time. Students' willingness helps them to manage their time in a way that creates good impact on their studies. Taking this research as base, a research was conducted to explore the relationship between smartphone addiction and academic performance in Nigeria. Result shows that relationship exist between these two variables. Lack of time management leads to poor academic performance (Florence, 2015).

### **2.5 Relationship between Smartphone Addiction and Academic Performance**

Nowadays youth's lives revolve around mobile phones. Kibona and Mgaya (2015) conducted a research to explore whether smartphone addiction is creating any impact on students' academic performance. Results show that there is a negative relation between smartphone addiction and academic performance of students of Tanzania regardless of their age, gender and marital status. It is found that overall smartphone addiction creates a negative impact on academic performance.

Similarly, another study was conducted to find out the reasons of smartphone addiction and recommended solutions to university students. Researcher found two main reasons behind smartphone addiction: firstly, it helps students to avoid loneliness. Secondly, device manufacturers targeted youngsters in their commercial ads and they continuously updated their smartphones versions and applications to attract the young ones. It is suggested that smartphone addiction can be reduced through providing useful and meaningful activities to youth (Albarashdi et al., 2016).

## **3. Theoretical Background**

The present research adopted the behaviorism theory (Aljomaa et al., 2016). This theory is based on learning behavior of an individual that can be controlled and changed by peer pressure. The behavior only gets affected through right environment and originator. It can be reduced and increased, based on the reinforcement and consequences such as reward and punishment. Smartphone addiction is a learned behavior and it occurs when students surround themselves in the environment such as in universities where everyone including their peers are using smartphone and updating statuses and socializing with other friends through social networking sites that attracts them. The urge to become one of them pressurize the person to do things that their peers are already doing. To make themselves attractive, they start socializing with people on Facebook, Twitter and other social networking sites that divert their attention as they spend most of their time on it and less time on studies. This behavior affects their personal and academic life. If we guide people or warn them by creating awareness about disadvantages of smartphone addiction on their health, personality and academic lives, then they can change their behavior for good (Albarashdi et al., 2016).

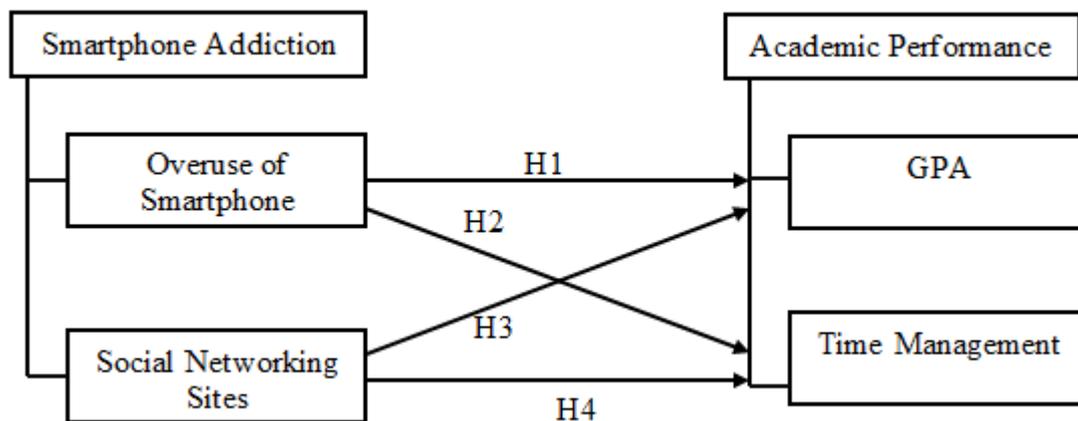
Following are the hypotheses to be testified in this research:

**H1:** There exists a negative relationship between over use of smartphone and GPA's among university students.

**H2:** There exists a negative relationship between over use of smartphone and time management among university students

**H3:** There exists a positive relationship between social networking sites and GPA's among university students

**H4:** There exists a negative relationship between social networking sites and time management among university students.



**Figure 1: Research Framework**

#### 4. Methodology

Quantitative approach was used in the present research. The participants were bachelor level students of age 19-24 studying in two private universities of Rawalpindi, Pakistan. Data was collected through self-administered questionnaire. Questionnaire was adapted from previous studies such as E-SAPS18 and SPAI developed by Rozgonjuk et al., (2016) and Lin et al., (2014) respectively, Mouri and Ali (2016), Bianchi and Phillips (2005), and Casey (2012). Likert scale was used to measure the responses of the respondents. Reliability of the questionnaire was measured by Cronbach alpha ( $\alpha$ ). The Cronbach alpha of overuse of smartphone was 0.77, social networking sites was 0.65, GPA was 0.64 and time management was .74. a total of 360 students were selected to participate in the study based convenience sampling technique. The privacy and confidentiality was made assured to the students. For data analysis, data was entered to SPSS (Statistical Package for Social Sciences) software (version 21). Pearson Correlation and multiple linear regression analysis were run to measure the relationship and impact of smartphone addiction and academic performance. All assumptions of regression were satisfied before running regression analysis.

#### 5. Results and Discussion

**Table 1: Demographic Factors**

Demographic factor	Group	Percentage
Gender	Male	51.10%
	Female	48.80%
Age	19-21	53.80%
	22-24	46.10%
Semester	Semester 4	43.88%
	Semester 6	24.44%
	Semester 8	31.66%
GPA	1.6-2.0	21.12%
	2.1-2.5	28.33%
	2.6-3.0	33.33%
	3.1-3.5	15.55%
	3.6-4.0	1.66%

The above-mentioned table presents details of male and female students (respondents of this research), their semesters and most importantly their GPAs with respect to the time they spend on the smartphones.

**Table 2: Descriptive and Correlation Analysis**

	Mean	SD	1	2	3	4
1 OUSP	3.24	0.03	( 0.76)			
2 SNS	3.31	0.02	0.61**	(0.64)		
3 GPA	3.11	0.01	-0.52**	-0.29**	(0.63)	
4 TM	2.94	0.94	-0.29**	-0.24**	0.79**	(0.73)

OUSP = overuse of smartphone, SNS = social networking sites, GPA = grade point average, TM = time management, ns = not significant, \* $p < .05$ , \*\* $p < .01$ , alpha reliabilities in brackets,  $n = 360$

Table 2 reports the descriptive statistics, bivariate correlations, and estimates of reliability (coefficient  $\alpha$ ) of the study variables. The first hypothesis of the study was that there exists a negative relationship between overuse of smartphone (OUSP) and GPAs among university students. Based on the results presented above in Table 2, initial support for this hypothesis was found ( $r = -0.52$ ,  $p < 0.01$ ). Similarly, it can be observed from the table 2 that OUSP is negatively associated with time management among university students i.e. ( $r = -0.29$ ,  $p < 0.01$ ). Thus, this result is also in line with second hypothesis of study. The above mentioned table also depicts that social networking sites has a significant negative correlation with GPA's among university students i.e. ( $r = -0.29$ ,  $p < 0.01$ ). Therefore, this result is not in line with third hypothesis of study. The fourth hypothesis of the study was that there exists a negative relationship between social networking sites and time management skills among students. Based on the results presented above, initial support for this hypothesis was found ( $r = -0.24$ ,  $p < 0.01$ ). The problem of multicollinearity does not exist in this data as the correlation coefficient ( $r$ ) values are between the range of 0.2 and 0.6.

**Table 3: Multiple Linear Regression Analysis**

Predictors	GPA		
	B	R <sup>2</sup>	$\Delta R^2$
OUSP	-0.54**		
SNS	-0.02**	0.27	0.27**
	TM		
OUSP	-0.24**		
SNS	-0.09**	0.09	0.09**

OUSP= overuse of smartphone, SNS = social networking sites, GPA= grade point average, TM= time management, ns = not significant, \* $p < 0.05$ , \*\* $p < 0.01$ ,  $n = 360$

Multiple linear regression analysis was used to test the hypothesis of study. Based on the results presented in Table 3, the first hypothesis is supported as there is a negative relationship between overuse of smartphone and GPA's of students ( $\beta = -0.54$ ,  $p < 0.01$ ). Likewise, the second hypothesis is also supported as there is a negative relationship between overuse of smartphone and time management of students ( $\beta = -0.24$ ,  $p < 0.01$ ). Meanwhile, the

third hypothesis is not supported as there is no positive relationship exists between social networking sites and GPA's of students ( $\beta = -0.02$ ,  $p < 0.01$ ). Moreover, fourth hypothesis of study is supported as there exist a negative relationship between social networking sites and time management skills of students ( $\beta = -0.09$ ,  $p < 0.01$ ).

There is a widespread concern about the role of smartphone in youth's lives. On the positive side, it can be observed that smartphones create a positive impact in youth's lives as it's a source of entertainment for them. It does not only increase their social interaction but it keeps them up to date as well (Nehra et al., 2012). Young people use smartphones to organize their events and activities (Thulin & Vilhelmson, 2007). Additionally, students usually use smartphones for self-expression. They also use smartphone apps for their academic work (Albarashdi et al., 2016). Through smartphones they can easily access services, information and can exchange their thoughts and ideas through messages and calls (Casey, 2012). As a result, it can be hypothesized that maybe there is a positive relationship between smartphone addiction and academic performance. However, the present research shows that there is a negative relationship between smartphone addiction and academic performance of students.

Moreover, it can be claimed through findings of this research that most of the students reported poor academic performance because of overuse of smartphones. Most of the interviewed students admitted that they use their smartphone more for fun purposes than academic purposes, as found by Jumoke et al. (2015). These findings further strengthened by Kamran (2010) where it was found that smartphones divert students' focus, thus create negative impact on learning skills due to poor attention to lectures and further giving less time to study with focus and attention.

A significant inverse relationship between overuse of smartphone and GPAs of students is found in this research. Additionally, the demographic factors presented above in table 1 shows that 21.12% students' GPA's are between 1.6 – 2.0 just because of overuse of smartphone; whereas only 1.66% students' GPA's are in a range of 3.6 – 4.0. These results are also consistent with other studies that attempt to measure the negative effects of smartphones on achieving good grades and participating in extracurricular activities (Alosaimi et al., 2016). Smartphone addiction is not only affecting their grades but also becoming the reason of sleep disturbance, anxiety, depression, laziness and other factors. Lepp et al. (2015) in their study showed that overuse of smartphone leads to poor GPAs because students use their phones more often that tends to give them poor GPAs as compared to those students who spend most of their time on studies.

A negative relationship between social networking sites and GPAs of students has been found. It has been found in this study that social networking sites create negative impact on GPAs of students. This is in consistent with Kirschner and Karpinski (2010) study where it was found that Facebook users spend their maximum time on socializing with others. Facebook users prefer to spend their time on Facebook to maintain their social interaction with others. Extensive use of social networking sites and lack of concentration affects their grades while non-users focus on their studies. As a result, non-users score high grades as they don't have to waste time in socialization on Facebook. Students claim to use social networking sites for educational purposes but they only use these sites for the sake of entertainment, as found by Paul et al. (2012). The present research supports previous studies as maximum students spend a lot of their time on social networking (i.e. Facebook, Twitter, Instagram, snap chat etc.) that not only effect their GPAs but also their performance in class.

The current research found that there was a significant negative relationship between overuse of smartphone and time management skills. It is analyzed through data that students don't bother to manage their time in an effective way. They mostly spend time in gaming, chatting, socializing and maintaining their social interactions. Their behavior creates negative impact on their studies. It is suggested that students should use their time in an effective way and

should not delay their tasks i.e. assignments and projects till their submission day (Aduke, 2015).

Relationship between social networking sites and time management skills shows a negative trend. Students who use social networking sites at a minimum level, tend to have a good time management skills compared to those students who try to maintain their social circle by devoting most of their time on social networking sites that always lead to poor time management skills and results in lower grades. The findings of present study are in line with Wentworth and Middleton (2014) study where they revealed that overuse of smartphone (calls, text messages and SNS) significantly affect students' academic performance.

The theoretical implications are modest but significant. The theory of behaviorism supports the present research as smartphone addiction of students is creating a negative impact on students' academic performance as students are learning and developing behaviors because of their environment. This behavior can be changed if we give students guidance related to the harmful impacts of smartphone addiction on their personal and academic lives. Moreover, making social networking sites course as a core subject, institutions can teach them ways to gain knowledge through them.

## **6. Conclusion**

Students lie in that age group where gadgets and tools fascinate them at every step. However, smartphone has already created a bad impact on today's youth (Kibona & Mgaya, 2015). The amount of time spent on smartphones significantly affects students' GPAs and time management skills. They know potential disadvantages of smartphone and how it could affect their studies but rather getting away from it, they always found to be involved more into it. Unfortunately, the age group that has been studied in this research depicts that it is really hard for students to balance their educational lives while using smartphones (Junco et al., 2011).

On the other hand, it is also significant to conclude that there are many informative applications available that can be utilized at parallel pace to improve academic results. A formulated schedule for personal use can improve their efficiency and performance as far as academic performance is concerned (Aduke, 2015). Findings of the present research suggest that administration of university has to take steps to improve their students' performance in studies. The present research recommends that universities should organize SNS course for students to enable them to use these sites for educational purpose and also arrange seminars for the guidance of time management. There should be a community that will deal with students' problems and to get opinions about teachers teaching style. A proper workshop about different subjects to gain students interest should also be organized quarterly throughout the degree program (Paul et al., 2012).

As the present study has provided fruitful insights about smartphone addiction and its relationship with academic performance among students in universities, the study also has certain limitations which may be addressed by the future researcher. The data was collected from a small sample size of 360 students of two private universities due to limitation of time and resources, therefore, a more diverse sample may lead to comprehensive information on the matter. Moreover, as the data was collected form a single source (i.e. questionnaire) thus there is a potential for common method bias. Multiple data sources should be considered by future researchers to remove possible biases. It is encouraged to study this present research in a longitudinal way to achieve better results through yearly survey. Future researchers can also investigate the impact of family background, salary, gender etc. as mediator or moderator in the present study. Results would be more accurate and reliable with large population of other educational institutes and also further respondents from other countries can be taken in consideration.

## References

- Aduke, A. F. (2015). Time management and students' academic performance in higher institutions, Nigeria—a case study of Ekiti State. *International Research in Education*, 3(2), 1-12.
- Albarashdi, H. S., Bouazza, A., Jabur, N. H., & Al-Zubaidi, A. S. (2016). Smartphone addiction reasons and solutions from the perspective of Sultan Qaboos University undergraduates : a qualitative study. *International Journal of Psychology & Behavior Analysis*, 2, 1–10.
- Aljomaa, S. S., Mohammad, M. F., Albursan, I. S., Bakhiet, S. F., & Abduljabbar, A. S. (2016). Smartphone addiction among university students in the light of some variables. *Computers in Human Behavior*, 61, 155–164. <https://doi.org/10.1016/j.chb.2016.03.041>
- Alosaimi, F. D., Alyahya, H., Alshahwan, H., Al Mahyijari, N., & Shaik, S. A. (2016). Smartphone addiction among university students in Riyadh, Saudi Arabia. *Saudi Medical Journal*, 37(6), 675–683. <https://doi.org/10.15537/smj.2016.6.14430>
- Bian, M., & Leung, L. (2015). Linking loneliness, shyness, smartphone addiction symptoms, and patterns of smartphone use to social capital. *Social Science Computer Review*, 33(1), 61–79. <https://doi.org/10.1177/0894439314528779>
- Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior*, 8(1), 39–51. <https://doi.org/10.1089/cpb.2005.8.39>
- Casey, B. M. (2012). Linking psychological attributes to smart phone addiction, face-to-face communication, present absence and social capital. *Graduation Project, Graduate School of the Chinese University of Hong Kong*.
- Florence, C., Dal Yong, J., & Seah, K. (2015). Transformative mobile game culture: socio-cultural analysis of the Korean mobile gaming in the Smartphone era'. *International Journal of Cultural Studies*, 18, 4.
- Jumoke, S., Oloruntopa, S. A., & Blessing, O. (2015). Analysis of mobile phone impact on student academic performance in tertiary Institution. *International Journal of Emerging Technology and Advanced Engineering*, 5(1), 2250–2459.
- Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27(2), 119–132. <https://doi.org/10.1111/j.1365-2729.2010.00387.x>
- Kamran, S. (2010). Mobile phone : calling and texting patterns of college students in Pakistan. *International Journal of Business and Management*, (Ling), 26–36. Retrieved from <http://ccsenet.org/journal/index.php/ijbm/article/view/5687>
- Kibona, L., & Mgaya, G. (2015). Smartphones' effects on academic performance of higher learning students. *Journal of Multidisciplinary Engineering Science and Technology*, 2(4), 3159–40. Retrieved from [www.jmest.org](http://www.jmest.org)
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook?? and academic performance. *Computers in Human Behavior*, 26(6), 1237–1245.
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2015). The relationship between cell phone use and academic performance in a sample of US college students. *Sage Open*, 5(1).
- Li, J., Lepp, A., & Barkley, J. E. (2015). Locus of control and cell phone use: implications for sleep quality, academic performance, and subjective well-being. *Computers in Human Behavior*, 52, 450–457. <https://doi.org/10.1016/j.chb.2015.06.021>
- Lin, Y. H., Chang, L. R., Lee, Y. H., Tseng, H. W., Kuo, T. B. J., & Chen, S. H. (2014). Development and validation of the smartphone addiction inventory (SPAI). *PLoS ONE*, 9(6). <https://doi.org/10.1371/journal.pone.0098312>
- Mouri, D., & Ali, A. C. (2016). Social networking in Bangladesh: boon or curse for academic engagement? *Management and Marketing*, 11(1), 380–393.

- <https://doi.org/10.1515/mmcks-2016-0004>
- Nehra, R., Kate, N., Grover, S., Khehra, N., & Basu, D. (2012). Does the excessive use of mobile phones in young adults reflect an emerging behavioral addiction? *Journal of Postgraduate Medicine Education and Research*, 46(December), 177–182. <https://doi.org/10.5005/jp-journals-10028-1040>
- Paul, J. A., Baker, H. M., & Cochran, J. D. (2012). Effect of online social networking on student academic performance. *Computers in Human Behavior*, 28(6), 2117–2127. <https://doi.org/10.1016/j.chb.2012.06.016>
- Roos, J. P. (2001). Postmodernity and mobile communications. Paper presented at the European Sociological Association on 5th Conference of the ESA, Helsinki, Finland.
- Rozgonjuk, D., Rosensvald, V., Janno, S., & Täht, K. (2016). Developing a shorter version of the Estonian Smartphone Addiction Proneness Scale (E-SAPS18). *Cyber psychology: Journal of Psychosocial Research on Cyberspace*, 10(4).
- Thulin, E., & Vilhelmson, B. (2007). Mobiles everywhere: youth, the mobile phone, and changes in everyday practice. *Young*, 15(3), 235-253.
- Vogels, T. (2017). Hands on With The New Flurry Analytics.
- Wallace, P. (2014). Internet addiction disorder and youth: There are growing concerns about compulsive online activity and that this could impede students' performance and social lives. *EMBO reports*, 15(1), 12-16.
- Wentworth, D. K., & Middleton, J. H. (2014). Computers & education technology use and academic performance. *Computers & Education*, 78, 306–311. <https://doi.org/10.1016/j.compedu.2014.06.012>.
- Zulauf, C. R., & Gortner, A. K. (1999). Use of time and academic performance of college students: does studying matter?. In *1999 Annual meeting* (pp. 8-11). American Agricultural Economics Association.