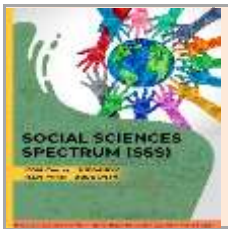

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Digital dependency: Exploring university students' smartphone usage patterns in higher education

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Abstract

The purpose of the study is to explore the smartphone addiction in university students. The study is descriptive and a cross-sectional survey method was used to collect the data. Students studying at Public University, Multan were the population of the study. A random sampling technique was employed to select the desired sample. 889 students participated in the study. A phone Addiction Scale was used in the study as well as a demographic data sheet to find information about the respondents. It included 20 items on 4 subscales of SPAS. A five-point Likert-type rating scale was used in the instrument. Relevant statistics were applied to find answers to the research questions. Data were analyzed using SPSS. Prior permission was taken to collect the data. Research ethics were followed. The perception of students regarding smartphones fell above the scale median near the scale point Strongly Agree. Based on gender, qualification, and a significant difference was observed in smartphone addiction. Teachers, parents, and the media should all contribute to raising awareness of this issue by informing people about the negative effects of SPA in print and online media. To occupy students' time, it is advised to start engaging them in healthful activities like workshops, sports, and lectures.

Keyword: Technology Addiction, Smart Phone, Smart Phone Addiction, University Students, Descriptive.

Introduction

Without a doubt, the most crucial tool for achieving educational goals and promoting national development is teacher competency. Students who succeed on competitive exams after graduating from school are hired for roles in the teaching profession. The evolution of technology over the past several years has brought about an unprecedented, dramatic change in the flow of human existence. Mobile phones (MPs) are widely available, and as a result, their use has increased dramatically in recent years. The usage of mobile phones in industrialized countries has a negative impact on the anxiety levels, interpersonal connections, mental health, and life satisfaction of aspiring teachers. Mobile phone (MP) addicts experience sad, forlorn, and lonely sensations when they are not utilizing their devices. It is extensively utilized and seen as the only form of communication, making it essential for both social and professional interactions (Takao et al., 2009; Zhang et al., 2020)

SPA is seen as a particular form of technology addiction. It refers to engaging in actions that are harmful to one's health repeatedly while using a phone. A feeling of mental discomfort brought on by SPA causes potential instructors to change their attitudes. The inability of individual to control the use of an SP, which has led to a multitude of social, behavioral, and emotional challenges in their day-to-day life, is referred to as SPA. SPA is a risky behavioral addiction that resembles internet addiction, gambling addiction, retail addiction, and video game addiction, according to theory. According to the writers, it may lead to significant forms of suffering in one's life. Although the smart phone (SP) makes life easier, there are drawbacks as well. A person with social anxiety may feel safer online because they perceive it to be less intimidating and more gratifying than face-to-face interaction. University students who use MPs too frequently lose their social skills and their ability to deal with issues (Evegu, 2014; Fernandez et al., 2014; Konan et al., 2018).

Although technology has benefits and drawbacks, students with high technological skills significantly contribute to the progress of their nations. The spread of technology appears to be bad for Pakistani kids. Students like using various devices, such as MPs, for communication and amusement purposes rather than to develop their teaching abilities or learn anything that would make them a better teacher. Unfortunately, they focus more on their MPs than on their professional lives, spending the majority of their time doing so. Due to their excessive use, students develop addictions to their SPs, which have detrimental effects on their general satisfaction as well as their ability to form healthy interpersonal interactions. The current study will thus examine how smart phone addiction impacts university students.

Literature review

The definition of addiction is the obsessive need to engage in a pleasurable activity despite the unfavorable effects on one's physical, emotional, social, or financial well-being. Because active reward techniques and developmental symptoms shared by both types of addictions are connected, behavioral addictions and disorders linked to substances were placed under the same umbrella term. The same physical and psychological symptoms that are evident in disorders connected to substances may be seen in behavioral addictions (Bian & Leung, 2015; Fischer et al., 2021).

Even if SPs are practical, excessive use of them in a way that conflicts with users' responsibilities and obligations might lead to addiction. Students who acquire a social preoccupation with SPs must be distracted from their other obligations in order to continue their addicted behavior. Some people could even go through lengthy periods of hunger in order to continue their addicted behavior. For a very long time, the civilization has benefitted immensely from the development of

communication technology. Its tools and technology have developed over time, enabling us to communicate with others more swiftly and simply as a result (Haug et al., 2015; Suparp, 2006).

The price of SPs has significantly decreased recently. These elements have led to a growth in smartphones' repute in recent years. People may use SPs to connect with their friends online, making it easier for them to carry out their daily activities, including their employment and recreational activities. Addiction to smartphones is connected with a number of harmful consequences. People may experience mood and temper changes as a result of this. Previous studies have demonstrated that SPA is effective in treating mood disorders. It has a negative impact on bodily functions including walking and running, eating, and sleeping, and has been connected to health issues. Additionally, SPA has the potential to cause mental disorders (Arbi et al., 2014; Boonuyang et al., 2015; Jitsukpluem, 2014; Jones, 2014).

SPA stands for a type of addiction that is connected to using SPs and having continuous access to the Internet via them. Users of SPA have a number of distinct negative impacts, including disruptions to their everyday lives, health, and academic performance, among others. It is a type of behavioral addiction that is predominantly characterized by the use of MPs. It is also known as problematic PSs usage or mobile phone reliance. Due to the widespread use of MPs, it is become harder to keep control over one's behavior, which results in an obsession with the gadget. The development of technology has significantly improved people's daily life even in a short period of time just a few years (Haug et al., 2015; Thongjuephong, 2016).

Recent years have seen some of the harmful effects of excessive use of SPs come to light, particularly when combined with a rise in cellular phone usage. No SP phobia may be considered as one of the issues that society faces as a result of these variables, and as a result, it is a subject of study in many industrialized countries. The global educational system has changed as a result of the proliferation of technology. In recent years, learner-centered environments have become more creative and dynamic (Huffaker, 2005; King et al., 2013; Nawaz et al., 2017).

Because SPs enhance public engagement and increase the likelihood that it will occur, students utilize them more frequently than other forms of communication. Although it gives college students a handy way to communicate, the growing use of smartphones among students has the potential to cause addiction, as research has shown. The habit of using SP gadgets is a type of developmental habit that when not employed may have a detrimental effect on a person's social life. Despite not being regarded as an addiction by law, it is growing increasingly widespread worldwide because of the suffering and worry it causes, among other things (Hassanzadeh & Rezaei, 2011; Hong et al. 2012).

When addicted to SPs, the preoccupied personality may appear to be functioning regularly and typically appropriate, and mobile reliance may not show up as overt symptoms or signals like functional hunger indicators. It is interesting that most study on cell phone dependency tends to focus either on the frequency with which SPA symptoms appear to occur or on the amount of time committed to mobile usage by counting requests made and acknowledged, although both are necessary. Therefore, according to studies, SPA is a type of behavior characterized by a number of negative symptoms, such as a disdain for the consequences of one's actions, a preoccupation with one's want, an inability to control one's desire, a drop in productivity, as well as feelings of fear and helplessness. Three indicators can be assessed to determine the extent of addiction (Lemon, 2002; Maier et al., 2015).

Compulsive SPA usage has been defined as a behavior that hinders day-to-day functioning in terms of efficiency, social interactions, physical welfare, or affects well-being in the moment. Despite

all of the benefits of telephones, research has linked difficult cellphone usage to anxiety. In certain cases, the concept that using a mobile may make individuals feel stressed, overloaded, and exhausted has been referred to as "techno stress" or "techno exhaustion." Addiction to mobile phones and their accompanying applications is defined as compulsive behavior towards their use. This leads to a feeling of discomfort, which motivates a change in one's thoughts, feelings, or behavior to alleviate the discomfort and restore stability, among other things. Users of SPs have access to a never-ending supply of knowledge and may communicate with others in ways that were previously thought to be impossible (Cao et al., 2018; Horwood & Anglim, 2018; Park et al., 2015; Park et al., 2018).

Being dependent on SPs has many unpleasant and detrimental effects. The excessive use of cellphones has been compared to violent violence and compulsive spending. There is a lot of pressure to get the greatest new brand and to own all of the top apps accessible because SPs have become into status symbols. Daily practices, habits, cultural norms, emancipatory objectives, marital relationships, and interpersonal interactions have all changed as a result of the employment of SPs (Thomee et al., 2011).

Research Methodology

This research study explored the perception of university students regarding SPA. Difference is demographic characteristics on the basis of SPA was also explored. The following research questions were developed in order to obtain answers to the study goals:

1. What is the perception of prospective teachers regarding SPA?

2. Is there any difference in SPA based on demographic variables?

This research study was based on a quantitative research approach. It was a descriptive research where cross-sectional was conducted to collect the quantitative data. The population of the study was comprised of students studying at Public University, Multan. A random sampling procedure was used to select 889 students from the population.

Instruments were comprised of a demographic data sheet that collected information regarding the demographic characteristics of the students. Additionally, the Smartphone Addiction Scale was included. It was applied to gauge how students felt about SPA. The researcher modified the SPAS created by Kwon et al. (2013) to examine the addictive behavior of smartphones. It had 33 elements covering the six SPA criteria. Strongly agree to strongly disagree on a Likert-style rating scale was utilized.

Table 1: *SPAS Subscales*

Subscales	**Items**
Mood Disorders (MD)	1, 2, 3, 4, 5, 6, 7, 8
Relationship Satisfaction (RS)	9, 10, 11, 12, 13, 14
Health Related Issues (HRI)	15, 16, 17
Academic Performance (AP)	18, 19, 20

The researcher tested 75 university students who weren't in the sample in a preliminary study. Professional judgment was used to confirm the instrument's authenticity. The gadget was altered on the suggestion of professionals. It was determined how reliable the instruments were by computing Cronbach's alpha. Its.83 value implies a high degree of dependability.

The tool was finished, and data was gathered. The researcher personally visited universities to get the data. To ensure voluntary, informed participation and ethical research conduct, an introduction letter explaining the study's purpose and assuring that the data would be used for research purposes only, that respondent anonymity would be strictly guaranteed, and that respondents were free to decline to participate in the research were enclosed with the questionnaire. Additionally, the researcher gave a proper and reasonable assurance that no information will be disclosed to or leaked to a third party. Data were collected and put into SPSS. Data were cleansed, and theories were put to the test. The data were analyzed using descriptive and inferential statistics.

Data Analysis and Interpretation

Table 2: *Descriptive Statistics of SPA (Item Wise)*

Items	N	M	SD	SD	DA	UD	A	SA
MD (Mood Disorders)								
SPA 1	889	4.56	.73	6	21	28	249	585
SPA 2	889	4.46	.75	5	23	38	314	509
SPA 3	889	4.47	.73	2	13	74	279	521
SPA 4	889	4.45	.73	2	31	23	346	487
SPA 5	889	4.37	.76	10	19	34	393	433
SPA 6	889	4.46	.65	3	14	18	391	463
SPA 7	889	4.42	.69	7	10	49	365	458
SPA 8	889	4.46	.67	9	10	28	368	474
RS (Relationship Satisfaction)								
SPA 9	889	4.44	.67	3	12	33	383	458
SPA 10	889	4.45	.64	1	14	21	399	454
SPA 11	889	4.38	.74	4	17	65	353	450
SPA 12	889	4.34	.76	5	17	78	356	433
SPA 13	889	4.31	.80	4	30	89	337	429
SPA 14	889	4.40	.71	2	15	61	357	454
HRI (Health Related Issues)								
SPA 15	889	4.33	.79	8	20	72	360	429
SPA 16	889	4.41	.73	10	9	44	366	460
SPA 17	889	4.47	.74	11	13	28	331	506
AP (Academic Performance)								
SPA 18	889	4.47	.70	3	16	41	326	503
SPA 19	889	4.45	.69	1	15	48	348	477
SPA 20	889	4.32	.78	5	31	53	382	418

Table 2 presents the descriptive statistics of SPAS. It shows mean and standard deviation of SPAS. Responses of university students regarding SPA on five point Likert type rating scale is also presented item wise.

Figure 1: *Item wise Mode of Responses on SPAS*

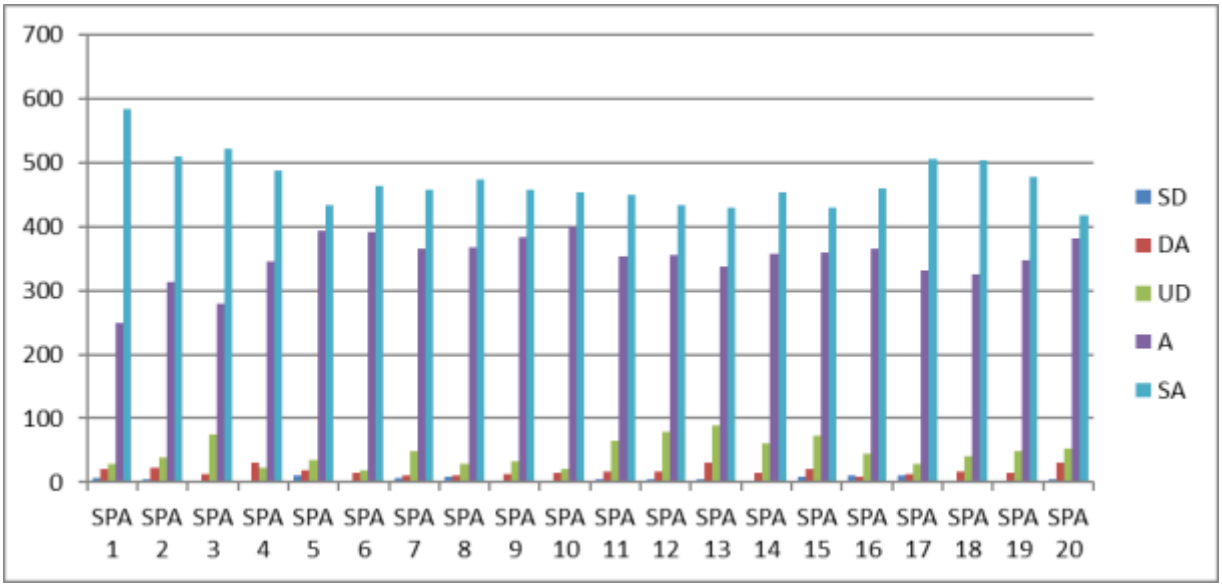

Table 3: *Descriptive Analysis of SPA*

Scale	*N*	*M*	*SD*	*MPI*	Range	Skew	Kurt
MD	889	35.21	4.22	4.40	16-40	-1.29	3.03
RS	889	26.46	3.25	4.41	12-30	-1.38	3.16
HRI	889	13.28	1.82	4.43	4-15	-1.82	5.50
AP	889	13.49	1.95	4.50	4-15	-1.77	4.22
SPA	889	88.43	9.72	4.42	40-100	-1.75	5.62

Table 3 shows the descriptive statistics of university students regarding SPA. Analysis of descriptive statistics indicates the data to be normally distributed. Hence, the assumption of normality met. Descriptive statistics were calculated to know the perception of university students regarding SPA. Perception of university students regarding SPA falls above the scale median. On five point Likert type rating scale, it is near the scale point Strongly Agree (M=88.43, MPI=4.42, SD= 9.72).

Table 4: *Gender wise Comparison of SPA Scores*

Scale	Gender	*N*	*M*	*SD*	*df*	*t*	*p*	Cohn's *d*/effect size r
MD	Female	311	34.04	4.59	887	5.83	.00	-0.422/-0.206
	Male	578	35.83	3.87				
RS	Female	311	25.98	3.50	887	3.06	.00	-0.221/-0.110
	Male	578	26.71	3.08				
HRI	Female	311	12.82	1.96	887	5.21	.00	-0.377/-0.185
	Male	578	13.51	1.69				
AP	Female	311	12.90	1.92	887	6.72	.00	-0.472/-0.230
	Male	578	13.80	1.89				
SPA	Female	311	85.76	10.76	887	5.76	.00	-0.417/-0.204
	Male	578	89.86	8.80				

Results of independent samples t-test are given in table 4. It was intended to compare the mean scores of SPA on the basis of gender. Significant difference was observed in SPA on the basis of gender t (887) = 5.76, p=.00. Hence it can be concluded that gender wise there is difference in SPA score of university students.

Table 5: *Qualification wise SPA Score*

Scale	Qualification	*N*	*M*	*SD*
MD	BS/MA/MSc	406	34.82	4.48
	MPhil	467	35.58	3.94
	PhD	16	33.93	4.35
RS	BS/MA/MSc	406	26.01	3.47
	MPhil	467	26.77	3.00
	PhD	16	28.25	3.10
HRI	BS/MA/MSc	406	12.96	2.04
	MPhil	467	13.54	1.56
	PhD	16	13.25	1.52
AP	BS/MA/MSc	406	13.32	2.21
	MPhil	467	13.62	1.69
	PhD	16	13.43	2.03
SPA	BS/MA/MSc	406	87.13	10.63
	MPhil	467	89.53	8.74
	PhD	16	88.87	9.38

Table 5 presents qualification wise descriptive statistics of SPA scores. On the basis of qualification, university students were divided into 4 categories.

Table 6: *Qualification wise Comparison of SPA Scores*

Scales		***df***	***SS***	***MS***	***F***	***p***	**η^2**
MD	Between Group	2	150.81	75.41	4.25	.01	0.010
	Within Group	886	15701.09	17.72			
RS	Between Group	2	178.50	89.25	8.54	.00	0.019
	Within Group	886	9250.16	10.44			
HRI	Between Group	2	73.74	36.87	11.35	.00	0.025
	Within Group	886	2876.18	3.24			
AP	Between Group	2	20.16	10.08	2.64	.07	0.006
	Within Group	886	3375.93	3.81			
SPA	Between Group	2	1261.12	630.56	6.74	.00	0.015
	Within Group	886	82798.58	93.45			

Results of independent samples t-test are given in table 6. It was intended to compare the mean scores of SPA on the basis of qualification. Significant difference was observed in SPA on the basis of qualification F (2, 886) = 6.74, p=.00. Hence it can be concluded that qualification wise there is difference in SPA score of university students.

Table 7: *SPA Score of Students in different age groups*

Scale	**Qualification**	***N***	***M***	***SD***
MD	Below 20	828	35.22	4.23
	21-30	59	35.23	3.32
	Above 30	2	28.00	16.97
RS	Below 20	828	26.38	3.29
	21-30	59	27.54	2.49
	Above 30	2	25.50	6.36
HRI	Below 20	828	13.25	1.82
	21-30	59	13.74	1.43
	Above 30	2	10.50	6.36
AP	Below 20	828	13.47	1.93
	21-30	59	13.79	1.84
	Above 30	2	9.00	7.07
SPA	Below 20	828	88.33	9.79
	21-30	59	90.32	6.68
	Above 30	2	73.00	36.76

Table 7 presents qualification wise descriptive statistics of SPA scores. On the basis of age, university students were divided into three categories.

Table 8: *Comparison of Students SPA Scores on the Basis of Age Groups*

Scales		***df***	***SS***	***MS***	***F***	***p***	**η^2**
MD	Between Group	2	104.12	52.06	2.92	.05	0.007
	Within Group	886	15747.78	17.77			
RS	Between Group	2	75.88	37.94	3.59	.03	0.008
	Within Group	886	9352.78	10.55			
HRI	Between Group	2	28.99	14.49	4.39	.01	0.010
	Within Group	886	2920.93	3.29			
AP	Between Group	2	46.02	23.01	6.08	.00	0.014
	Within Group	886	3350.07	3.78			
SPA	Between Group	2	695.50	347.75	3.69	.03	0.008
	Within Group	886	83364.21	94.09			

Results of independent samples t-test are given in table 8. It was intended to compare the mean scores of SPA on the basis of age. Significant difference was observed in SPA on the basis of age F (2, 886) = 3.69, p=.03. Hence it can be concluded that age wise there is difference in SPA score of university students.

Findings

Descriptive statistics were calculated to know the perception of university students regarding SPA. Perception of university students regarding SPA falls above the scale median. On five point Likert type rating scale, it is near the scale point Strongly Agree (M=88.43, MPI=4.42, SD= 9.72). Independent samples t-test was applied to know the difference in SPA on the basis of gender. It was intended to compare the mean scores of SPA on the basis of gender. Significant difference was observed in SPA on the basis of gender t (887) = 5.76, p=.00. Hence it can be concluded that gender wise there is difference in SPA score of university students.

One-way ANOVA was applied to know the difference in SPA on the basis of qualification. It was intended to compare the mean scores of SPA on the basis of qualification. Significant difference was observed in SPA on the basis of qualification F (2, 886) = 6.74, p=.00. Hence it can be concluded that qualification wise there is difference in SPA score of university students. One-way ANOVA was applied to know the difference in SPA on the basis of age. It was intended to compare the mean scores of SPA on the basis of age. Significant difference was observed in SPA on the basis of age F (2, 886) = 3.69, p=.03. Hence it can be concluded that age wise there is difference in SPA score of university students.

Discussion

Present study was intended to explore the perception of SPA of university students. It also looked into the variations in SPA based on demographic traits. Results from the survey show that university students do indeed have a problem with smartphone addiction since they

overwhelmingly support the hypothesis. The outcomes are consistent with the SPA research that was done by researchers (Archibald et al., 2014; Handal et al., 2013; Marinakou & Giousmpasoglou, 2014; Mills et al., 2014; Pegrum et al., 2013; Sad & Goktas, 2013; Thomas & Bannon, 2013; Woodill, 2013). The findings were shown to be in line with other studies (Adalar, 2021; Reese & Bomhold, 2013). According to study (Kwon, 2013; Savc & Aysan, 2017), similar outcomes can be explained. Several researchers have reported comparable findings (Aktaş & Ylmaz, 2017; Dahlstrom, et al., 2012; Hong, et al., 2012). The study's conclusions showed that university students' SPA varied significantly according on their gender, age, and educational background. Similar findings are unveiled by many other researchers (Heller et al., 2004; Huebner, 2004; Schwarz & Strack, 1991). Many other researchers also reported similar findings (Choliz, 2012; Yılmaz et al., 2015). Teachers, parents, and the media should all contribute to raising awareness of this issue by informing people about the negative effects of SPA in print and online media. To occupy students' time, it is advised to start engaging them in healthful activities like workshops, sports, and lectures.

Conclusion

Based on the findings of the study, it is evident that the matter of handling reliance on smartphones among university students is a multifaceted task that necessitates consideration from faculty members, policymakers, and professionals in mental health. Endeavors that are designed to enhance consciousness, furnish resources for responsible smartphone usage, and cultivate a supportive milieu for students are crucial measures towards minimizing the adverse repercussions linked to smartphone dependency. Additional research is required to develop deeper into the fundamental causes and prospective remedies for this predicament, with the ultimate objective of advocating the well-being and academic accomplishment of university students in the digital era.

References

Adalar, H. (2021). Smartphone Perception and Experiences of Teacher Candidates during COVID-19 Process: What is My Smartphone for Me? *Education Quarterly Reviews, 4*(2), 1-13.

Aktaş, H., & Yılmaz, N. (2017). Smartphone addiction of university youth in terms of loneliness and shyness. *International Journal of Social Sciences and Education Research*, *3*(1), 85-100.

Archibald, R. B., & Feldman, D. H. (2014). *Why does college cost so much?* Oxford University Press.

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.

Cao, X., Masood, A., Luqman, A., & Ali, A. (2018). Excessive use of mobile social networking sites and poor academic performance: Antecedents and consequences from stressor-strain-outcome perspective. *Computers in Human Behavior*, *85*(21), 163-174.

Choliz, M. (2012). Mobile-phone addiction in adolescence: the test of mobile phone dependence (TMD). *Progress in health sciences*, *2*(1), 33-44.

Dahlstrom, E., Dziuban, C., & Walker, J. (2012). *ECAR Study of Undergraduate Students and Information Technology* [Research report]. EDUCAUSE Center for Applied Research, Louisville, CO, Kentucky. https://www.ferris.edu/it/central-office/pdfs-docs/StudentandInformationTechnology2014.pdf.

Fischer, Grote, L., Kothgassner, O. D., & Felnhofer, A. (2021). The impact of problematic smartphone uses on children's and adolescents' quality of life: A systematic review. *Actaaediatrica, 110*(5), 1417-1424.

Handal, B., MacNish, J., & Petocz, P. (2013). Academics adopting mobile devices: The zone of Haythornthwaite. In R. Andrews & C. Haythornthwaite (Eds.), *The Sage handbook of e-learning research* (2nd ed., pp. 221-247). Sage.

Hassanzadeh, R., & Rezaei, A. (2011). Effect of Sex, Course and Age on SMS Addiction in Students. *Middle East Journal of Scientific Research, 10*(5), 619- 625.

Haug, S., P. Castro, R., Kwon, M., Filler, A., Kowatsch, T. and P. Schaub, M. (2015). Smartphone use and smartphone addiction among young people in Switzerland. *Journal of Behavioral Addictions, 4*(4), 299-307.

Heller, D., Watson, D., & Ilies, R. (2004). The Role of Person Versus Situation in Life Satisfaction: A Critical Examination. *Psychological Bulletin, 130*(4), 574- 600.

Hong, F. Y., Chiu, S. I., & Huang, D. H. (2012). A model of the relationship between psychological characteristics, mobile phone addiction and use of mobile phones by Taiwanese university female students. *Computers in human behavior*, *28*(6), 2152-2159.

Horwood, S., & Anglim, J. (2018). Personality and problematic smartphone use: Afacet-level analysis using the Five Factor Model and HEXACO frameworks. *Computers in Human Behavior, 85(*6), 349-359.

Huebner, E. S. (2004). A review of the brief multidimensional students' life satisfaction scale. *Social Indicators Research, 79*(3), 477-484.

Huffaker, D. A., & Calvert, S. L. (2005). Gender, identity, and language use in teenage blogs. *Journal of Computer-Mediated Communication*, *10*(2), 10-21.

Jitsukpluem, W. (2014). Lack of sociability. *Psychological Bulletin, 130*(4), 574- 600.

Jones, T. 2014. Students 'cell phone addiction and their opinions. *The Elon Journal of Undergraduate Research in Communications 5*(1), 74-80.

King, A. L. S., Valença, A. M., Silva, A. C., Baczynski, T., Carvalho, M. R. & Nardi, A. E. (2013). Nomophobia: dependency on virtual environments or social phobia? *Computers in Human Behavior, 29*(1), 140–144.

Konan, N., Durmuş, E., Türkoğlu, D., & Ağıroğlu Bakır, A. (2018). How is smartphone addiction related to interaction anxiety of prospective teachers? *Education Sciences, 8*(4), 186.

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale: development and validation of a short version for adolescents. *Plos One, 8*(12), 154-240.

Lemon, J. (2002). Can We Call Behaviors Addictive? *Clinical Psychologist, 6*(2), 44- 49.

Lopez-Fernandez, O., Honrubia-Serrano, L., Freixa-Blanxart, M., & Gibson, W. (2014). Prevalence of problematic mobile phone use in Britishadolescents. *Cyber Psychology, Behavior, and Social Networking, 17*(2), 91-98.

Maier, J. A., Martinez, C., Kasavajhala, K., Wickstrom, L., Hauser, K. E., & Simmerling, C. (2015). Improving the accuracy of protein side chain and backbone parameters. *Journal of Chemical Theory and Computation, 11*(8), 3696-3713.

Marinakou, E. & Giousmpasoglou, C. (2014, March 27-30). *M-learning in higher education in Bahrain: The educators' view* [Paper presentation]. Proceedings of the, HBMeU Congress 2014: Leading transformation to sustainable excellence, Dubai, UAE.

Mills, L. A., Knezek, G., & Khaddage, F. (2014). Information seeking, information sharing, and going mobile: Three bridges to informal learning. *Computers in Human Behavior, 32*(2), 324-334.

Nawaz, I., Sultana, I., Amjad, M. J., & Shaheen, A. (2017). Measuring the enormity of nomophobia among youth in Pakistan. *Journal of Technology in Behavioral Science, 19*(2), 1-7.

Park, J., Kim, J., Kim, J., Kim, K., Kim, N., Choi, I., Lee, S., & Yim, J. (2015). The effects of heavy smartphone use on the cervical angle, pain threshold of neck muscles and depression. *Advanced Science and Technology Letters, 91*(3), 12- 17.

Park, S. Y., Kim, Y. H., Lee, S. Y., Sohn, W., Lee, J. E., Shim, Y. S., & Jang, H. W. (2018). Highly selective and sensitive chemo resistive humidity sensors. *Journal of Materials Chemistry, 6*(12), 5016-5024.

Pegrum, M., Oakley, G., & Faulkner, R. (2013). Schools going mobile: A study of the adoption of mobile handheld technologies in Western Australian independent schools. *Australasian Journal of Educational Technology, 29*(1), 66-81.

Reese Bomhold, C. (2013). Educational use of smart phone technology: A survey of mobile phone application use by undergraduate university students. *Program*: electronic liberay and information system, *47*(4), 424-436.

Şad, S. N., Göktaş, Ö., & Ebner, M. (2016). Prospective teachers are they already mobile? *In Mobile, Ubiquitous, and Pervasive Learning, 7*(6), 139-166.

Savci, M., & Aysan, F. (2017). Technological addictions and social connectedness: predictor effect of internet addiction, social media addiction, digital game addiction and smartphone addiction on social connectedness. *Dusunen Adam: Journal of Psychiatry & Neurological Sciences, 30*(3), 202-216.

Schwarz, N., & Strack, F. (1991). Context effects in attitude surveys: Applying cognitive theory to social research. *European review of social psychology*, *2*(1), 31-50.

Suparp, S. 2006. Revolution of communication and technology. *Newsletter Science 3*(1), 18-20.

Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive personality and problematic mobile phone use. *Cyber Psychology & Behavior, 12*(5), 501-507.

Thomas, K., & O'Bannon, B. (2013). Cell phones in the classroom: Preservice teachers' perceptions. *Journal of Digital Learning in Teacher Education, 30*(1), 11-20.

Thongjuephong, P. (2016). Factors and effects of smart phone addiction to job performance, nomo-phobia and conflict with others. *Journal of Information System in Business, 2*(3), 40-54.

Woodill, G. (2013). *The unique affordances of mobile learning understand how to leverage them prior to design and development*. Springer.

Yılmaz, G., Şar, A. H., & Civan, S. (2015). Investigation of adolescent mobile phone addiction by social anxiety effect of some variable. *Online Journal of Technology Addiction & Cyberbullying, 2*(4), 20-37.

Zhang, G., Yang, X., Tu, X., Ding, N., & Lau, J. T. (2020). Prospective relationships between mobile phone dependence and mental health status among Chinese undergraduate students with college adjustment as a mediator. *Journal of Affective Disorders, 260(*15), 498-505.