

## Influence of Smartphone Addiction on Learning Immersion, Sociality and Morality

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### Abstract

The purpose of the present study was to investigate the influence of smartphone addiction on learning immersion, sociality and morality of college students and the present study is a descriptive survey research to investigate the influence of smartphone addiction on learning immersion, sociality and morality of college students. The subjects were 145 freshman, sophomore and junior students in the Department of Health at a college located in the Gyeongbuk region, and the data were collected from November 15 to 18, 2017. Upon analyzing the correlations between the variables, a negative correlation was found between learning immersion and sociality and between learning immersion and morality, indicating that the learning immersion decreased as the sociality or morality increased. A positive correlation was found between sociality and morality, indicating that those who have a higher degree of sociality have a higher level of morality.

**Keywords:** Smartphone, Learning Immersion, Sociality, Morality

## 1. Introduction

### 1.1 Need for Study

With the development of the internet, users now can access the internet whenever they want[1]. The extension of the use of smartphone, a representative digital device that has emerged with the development of the internet, has brought changes to many aspects of our life[2]. Smart phones have been around in our lives because they can be used anywhere[3]. The number of smartphone service subscribers in Korea reached over 20 million in 2011, and further increased to 35,950,000, as of July 2013[4]. Such an explosive increase of the utilization of smartphones has affected various parts of our life.

Smartphones not only have the communication functions of mobile phones, including telephone calls and text messages, but are also combined with various functions of digital media, thus making them used for internet search, photography shooting, navigation, games, music playing, shopping, banking, video playing, and home networking; this allows users to freely select applications they want in a convenient way. In addition, smartphones may be used whenever and wherever wanted and thus are not limited by the space and time, enabling the users to acquire the desired information quickly[5]. Due to the convenience of the smartphone terminals and the provision of the information useful for life, smartphone users have the intention to use the devices continuously, while paying the appropriate amount of economic cost. Moreover, smartphone users

may consider their utilization of the advanced information technology as being related to their social reputation and as a means of expressing themselves[6].

However, many studies have shown that various pathological symptoms caused by the habitual and excessive use of smartphones lie behind the convenience and effectiveness that smartphones provide to the daily routine.

Since smartphones have the functions of both the internet and mobile phones, they cause a higher degree of addiction than that of the internet or the mobile phones alone, resulting in various physical, mental, and social problems.

In the physical aspects, a high degree of smartphone addiction may cause a brain dysfunction called 'popcorn brain,' which lowers the sense of reality, decreases cognitive functions and concentration, and increases such symptoms as attention deficit hyperactivity disorder (ADHD) by removing self-control over certain actions[7]. In addition, excessive use of smartphones may cause eye fatigue, muscle pain, nervous system disorders, poor eyesight, dry eye syndrome, carpal tunnel syndrome, turtle neck syndrome, shoulder pain, and upper limb pain[8]. A study has shown that smartphone-addicted college students immediately start to use a smartphone when given a problem or task to handle and thus lack the time for the brain to rest, which results in the decrease of creativity, attention span, change of thought, and judgment[9]. Moreover, a high degree of smartphone addiction causes difficulties in social relationship and retards the development of sociality, because of the absence of face-to-face communication[10]. The difficulties in social relationship lead to additive use of smartphones and further increase the psychological anxieties in a vicious cycle.

Specific reports about smartphone addiction in Korea have been published by the Ministry of Science, ICT and Future Planning and the National Information Society Agency since 2011, following the full-scale introduction of smartphones in 2010.

The twenties are in a transition period from adolescence to adulthood when they become independent physically and mentally from their parents and prepare and realize their specific plans of their life. The number of times of using smartphones is increasing more in the twenties, because they may freely use smartphones without any limitations in terms of space and time in the absence of any control or direction given to the elementary, middle and high student[11].

The ratio of adults in smartphone addiction risk group accounted for 11.3% in 2014 with an increase of 2.4 in comparison with the previous year. The percentage of the twenties in the smartphone addiction risk group was 19.6%, which was about four times higher than that of the fifties (4.8%). Many reports have included the concerns about smartphone addiction in the twenties. A report has shown that the college students in the smartphone addiction risk group use smartphones for an average of 5.5 hours per day, which was higher than that of the entire adult smartphone addiction group (5.3 hours), and that the average number of times of using smartphones per day by the college students of the group was 26.4, which was higher than that of the elementary students (19.6), middle school students (23.3) and high school students (23.5)[12].

As described above, the risk of smartphone addiction in adults is increasing day by day. This means that smartphone addiction causes problems for college students in adulthood that follows adolescence. However, since most studies on the smartphone addiction are focused on the adolescence period, there is an essential need for conducting research on the smartphone addiction in college students.

In addition, the school performance stress and the difficulties in employment and social relationship college students have causes the feeling of deprivation and emotional difficulties with increased depression and anxieties[13]. These psychological difficulties may lead to pathologic immersion to the use of smartphones in adulthood when the college students may fully enjoy the freedom of using the devices, resulting in addiction to smartphones. The present study was conducted to investigate the influence of smartphone addiction on the learning immersion, sociality and morality of college students.

## **1.2 Purpose of Study**

The purpose of the present study was to investigate the influence of smartphone addiction on learning immersion, sociality and morality of college students with the following specific objectives:

- A. To investigate the subjects' general characteristics;
- B. To investigate the subjects' degree of smartphone addiction;
- C. To investigate the subjects' learning immersion, sociality and morality; and
- D. To investigate the correlation of smartphone addiction with learning immersion, sociality and morality.

## **2. Methods**

### **2.1 Study Design**

The present study is a descriptive survey research to investigate the influence of smartphone addiction on learning immersion, sociality and morality of college students.

### **2.2 Subjects**

The subjects were 145 freshman, sophomore and junior students in the Department of Health at a college located in the Gyeongbuk region, and the data were collected from November 15 to 18, 2017.

### **2.3 Research Tools**

#### **A. Smartphone Addiction Survey Tool**

A questionnaire for the measurement of smartphone addiction was prepared by using the tools employed by Lee (2016) in the study, "Verification of Validity of Smartphone Addiction Measurement Scale (S-Scale) and Analysis of Factors to Smartphone Addiction." The overall reliability of the scale was 0.876. The questionnaire for the measurement of smartphone addiction, which was used in the present study, consisted of a total of 15 questions, including the question asking the respondent's agreement to the statement, 'Excessive use of smartphones decreases academic accomplishment or work efficiency.'

#### **B. Learning Immersion Survey Tool**

A questionnaire for the measurement of learning immersion was structured by using the tools employed by Csikszentmihaiyi (1990), Seok (2006, 2007, 2008), Kang (2007) and Yang (2010). The reliability of the tool used by Yang (2010) was relatively high at 0.90. The questionnaire for the measurement of learning immersion used in the present study comprised a total of 10 questions, including the question asking the respondent's agreement to the statement, 'I sometimes lose track of time when I study what I like.'

#### **C. Morality Survey Tool**

A questionnaire for the measurement of morality was prepared by reconstructing for college students the tool produced and used by Cho (1995) and by analyzing the validity and reliability. The questionnaire was composed of a total of 16 questions, including 8 questions about altruism and 8 questions about social responsibility to measure morality in a 5-point Likert scale. The survey was performed by self-rating in the scale from 1 point for 'strongly disagree' to 5 points 'strongly agree.' The morality score ranged from 16 to 80, with a higher total score indicating a higher degree of citizenship. The overall reliability was 0.732.

#### **D. Sociality**

A questionnaire for the measurement of sociality was prepared by reconstructing for college students the tool produced and used by Kim (1995) and by analyzing the validity and reliability. The questionnaire consisted of a total of 20 questions, including 4 questions about autonomy, 4 questions about diligence, 4 questions about sociability, 4 questions about stability, and 4 questions about leadership to measure sociality in a 5-point Likert scale. The survey was performed by self-rating in the scale from 1 point for 'strongly disagree' to 5 points 'strongly agree.' The range of the sociality score was from 20 to 100, with a higher total score indicating a higher degree of sociality. The overall reliability was 0.728.

### **2.4 Data Collection Methods**

The data were collected by using the self-reporting questionnaires from November 15 to 18, 2016. The questionnaires were filled by the subjects individually, put into the supplied envelopes and sealed, and collected by research assistants through a visit. A total of 145 copies of the questionnaires were distributed, and all of

them were returned and used in the analysis (return rate: 100%).

## 2.5 Data Analysis Methods

The data were analyzed by using the SPSS/WIN 20.0 software program to calculate the percentages, standard deviations and Pearson's correlation coefficients of the data and to perform t-test, one-way ANOVA, Scheffe test, and stepwise multiple regression analysis.

## 3. Results

### 3.1 General Characteristics of Subjects

The general characteristics of the subjects investigated included gender, grade, satisfaction to college life, academic performance, whether to use a smartphone or not, duration of smartphone use, and time of initial smartphone use.

#### The general characteristics of the subjects are as follows.

The subjects included 19 male subjects (13.1%, The numbers in parentheses, hereinafter, refer to percentage) and 126 female subjects (86.9); most of the subjects were female. The subjects included 34 freshmen (23.4), 75 sophomores (51.7) and 36 juniors, with the largest number of sophomores, followed by juniors and freshmen. With regard to the type of residence, 63 (43.4) of the subjects lived in their family homes, 52 (35.9) in self-boarding residence, and 30 (20.7) in dormitories. For the degree of satisfaction to college life, 5 (3.4) subjects answered 'very high,' 26 (17.9) 'high,' 100 (69.0) 'moderate,' 4 (2.8) 'low,' and 10 (6.9) 'very low.' The average academic performance score was over 4.0 in 12 (8.3) subjects, equal to or higher than 3.5 and lower than 4.0 in 47 (32.4) subjects, equal to or higher than 3.0 and lower than 3.5 in 61 (42.1) subjects, and lower than 3.0 in 25 (17.2) subjects.

Regarding the use of a smartphone, most of the subjects (140 subjects) (96.5) responded that they use smartphones. The duration of smartphone use per day was in the order of over 3 hours in 75 (51.7) subjects, equal to or more than 2 hours and less than 3 hours in 37 (25.5) subjects, equal to or more than 30 minutes and less than 1 hour in 4 (2.8) subjects, and less than 30 minutes in 3 (2.1) subjects. The number of subjects increased as the duration of smartphone use increased. The time of initial smartphone use was the middle school years in 62 (42.8) subjects, the high school years in 47 (34.4) subjects, the higher elementary school years and the college years/over 19 years of age in 17 (11.7) subjects, and the lower elementary school years and the below school age/kindergarten years in 1 (0.7) subject, respectively.

### 3.2 Learning Immersion, Sociality, Morality and Degree of Smartphone Addiction

The average scores of learning immersion, sociality and morality of the subjects were 3.15, 2.68 and 2.49, respectively, and the average smartphone addiction score was 2.65 (Table 1).

**Table 1. Average scores of learning immersion, sociality, morality and smartphone addiction (N=145)**

Item	Average ± Standard Deviation	Max.	min.
Learning immersion	3.15±0.49	4.40	1.80
Sociality	2.68±0.40	3.65	1.40
Morality	2.49±0.46	3.81	1.31
Smartphone addiction	2.65±0.50	3.80	1.53

**3.3 Learning Immersion, Sociality, Morality and Degree of Smartphone Addiction Depending on General Characteristics**

The learning immersion, sociality, morality and smartphone addiction were analyzed according to the general characteristics of the subjects. The learning immersion showed significant differences with the academic performance. The morality showed significant differences with whether to use a smartphone and the duration of smartphone use.

The average learning immersion score of the subjects was 3.15 ( $\pm 0.49$ ). With respect to the scores of the subcategories of learning immersion, the highest learning immersion score was 3.36 ( $\pm 0.55$ ) found in the subjects who reported 'the average academic performance score of equal to or higher than 4.0.'

As for the morality score according to the general characteristics, whether to use a smartphone or not ( $F=1.801$ ,  $p=0.014$ ) and the duration of smartphone use ( $F=1.653$ ,  $p=0.030$ ) showed significant statistical differences. For the morality score depending on whether to use a smartphone or not, it was higher in the subjects using smartphones at 2.50 points ( $\pm 0.46$ ) than in the subjects not using smartphones ( $2.27 \pm 0.38$  points). In terms of the duration of smartphone use, the morality score was highest in the duration of smartphone use equal to or more than 30 minutes and less than 1 hour ( $2.87 \pm 0.71$ ), while the morality score showed significant statistical differences among the durations of smartphone use less than 30 minutes ( $2.85 \pm 0.34$ ), equal to or more than 30 minutes and less than 1 hour ( $2.87 \pm 0.71$ ), equal to or more than 1 hour and less than 2 hours ( $2.43 \pm 0.49$ ), equal to or more than 2 hours and less than 3 hours ( $2.41 \pm 0.45$ ), and equal to or more than 3 hours ( $2.51 \pm 0.44$ ) (Table 2)

**3.4 Correlations Between Learning Immersion, Sociality, Morality and Smartphone Addiction**

The correlations between learning immersion, sociality, morality and smartphone addiction were analyzed. A negative correlation was found between learning immersion and sociality and between learning immersion and morality, indicating that the learning immersion decreased as the sociality or morality increased. A positive correlation was found between sociality and morality, indicating that those who have a higher degree of sociality have a higher level of morality (Table 3).

**Table 2. Differences of learning immersion, sociality, morality and smartphone addiction according to general characteristics of subjects**

Charact- Eristics	Item	Learning immersion		Sociality		Morality		smartphone addiction	
		M $\pm$ SD	F(p)	M $\pm$ SD	F(p)	M $\pm$ SD	F(p)	M $\pm$ SD	F(p)
Average Academic Performance Score	Equal to or higher than 4.0	3.36 $\pm 0.55$	1.689 (0.049)	2.48 $\pm 0.54$	0.750 (0.839)	2.45 $\pm 0.50$	1.294 (0.166)	2.55 $\pm 0.51$	0.908 (0.609)
	Equal to or higher than 3.5 and lower than 4.0	3.29 $\pm 0.52$		2.68 $\pm 0.40$		2.46 $\pm 0.54$		2.66 $\pm 0.46$	
	Equal to or higher than 3.0 and lower than 3.5	3.11 $\pm 0.48$		2.70 $\pm 0.39$		2.52 $\pm 0.44$		2.67 $\pm 0.53$	
	Lower than 3.0	3.11 $\pm 0.44$		2.68 $\pm 0.37$		2.45 $\pm 0.35$		2.65 $\pm 0.53$	
Use of Smartphone	Yes	3.16 $\pm 0.50$	1.388 (0.127)	2.67 $\pm 0.41$	0.246 (0.839)	2.50 $\pm 0.46$	1.801 (0.014)	2.65 $\pm 0.51$	0.675 (0.896)
	No	3.01 $\pm 0.30$		2.85 $\pm 0.21$		2.27 $\pm 0.38$		2.69 $\pm 0.22$	

	Less than 30 minutes	2.96 ±0.15	0.684 (0.859)	2.76 ±0.53	0.768 (0.818)	2.85 ±0.34	1.653 (0.030)	2.62 ±0.34	0.690 (0.882)
	Equal to or more than 30 minutes and less than 1 hour	3.27± 0.62		2.48 ±0.18		2.87 ±0.71		2.18 ±0.58	
Duration of Smartphone Use	Equal to or more than 1 hours and less than 2	3.08 ±0.45		2.67 ±0.39		2.43 ±0.49		2.52 ±0.45	
	Equal to or more than 2 hours and less than 3 hours	3.20 ±0.50		2.71 ±0.31		2.41 ±0.45		2.66 ±0.49	
	Equal to or more than 3 hours	3.15 ±0.51		2.66 ±0.44		2.51 ±0.44		2.72 ±0.52	

**Table 3 Correlations between learning immersion, sociality, morality and smartphone addiction (N=145)**

	Learning immersion	Sociality	Morality	smartphone addiction
Learning immersion	-			
Sociality	-.256**			
Morality	-.166**	.556**		
Smartphone addiction	.036	.036	.060	-

#### 4. Conclusions

The following conclusions were drawn from the results described above.

First, the analysis of the differences of the learning immersion, sociality, morality and smartphone addiction according to the general characteristics of the subjects indicated that the learning immersion and academic performance scores showed significant differences. The morality showed significant differences with whether to use a smartphone and the duration of smartphone use.

Second, the average learning immersion score of the subjects was 3.15 ( $\pm 0.49$ ). With regard to the scores of the subcategories of learning immersion, the highest learning immersion score was 3.36 ( $\pm 0.55$ ) found in the subjects who reported 'the average academic performance score of equal to or higher than 4.0.' As for the morality score according to the general characteristics, whether to use a smartphone or not ( $F=1.801$ ,  $p=0.014$ ) and the duration of smartphone use ( $F=1.653$ ,  $p=0.030$ ) showed significant statistical differences. For the morality score depending on whether to use a smartphone or not, it was higher in the subjects using smartphones at 2.50 points ( $\pm 0.46$ ) than in the subjects not using smartphones ( $2.27 \pm 0.38$  points), showing significant statistical differences.

Third, upon analyzing the correlations between the variables, a negative correlation was found between learning immersion and sociality and between learning immersion and morality, indicating that the learning immersion decreased as the sociality or morality increased. A positive correlation was found between sociality and morality, indicating that those who have a higher degree of sociality have a higher level of morality.

The result of the present study showed that smartphone addiction does not have an influence on learning immersion, morality and sociality. The development and application of an educational program may be needed to help college students to develop learning immersion as well as sociality and morality.

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