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# How Is Smartphone Addiction Related to Interaction Anxiety of Prospective Teachers?

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**Abstract:** The main purpose of this research is to determine the relationship between prospective teachers' smartphone addiction and interaction anxiety. For this purpose, quantitative research was carried out within the relational screening model. The population of the research was composed of senior students and pedagogical formation students from Inonu University Faculty of Education in Turkey. The sample consisted of a total of 330 prospective teachers, including 117 Faculty of Education and 213 pedagogical formation students. Data of the study were obtained via The Smartphone Addiction Scale-Short Version (SAS-SV) and The Interaction Anxiousness Scale (IAS). As a result of the research, it was seen that the scores of prospective teachers' on smartphone use was at the lower level and the scores of interaction anxiety were close to the lower level of anxiety. There was also a statistically significant positive correlation between prospective teachers' smartphone addiction and interaction anxiety.

**Keywords:** prospective teacher; smartphone addiction; interaction anxiety

## 1. Introduction

The flow of life has undergone an incredible transformation, especially due to the technological developments we have experienced in the last hundred years. Phones, and especially smartphones, can also be considered in this context. Originally designed and used as a communication device, phones have begun to be used outside of this feature due to the rapid changes in technology. In particular, smartphones have taken on functions far beyond being communication tools.

Since mobile phones, which are one of the most striking examples of technology for social life, were introduced to the market in the 1990s, it appears that the mobile phone sector has been one of the fastest growing sectors in the world [1]. According to the results of the Global Mobile Users Survey (GMCS) that was conducted by Deloitte with the participation of many countries since 2012, Turkey is one of the countries where mobile phone dependency is the highest. Users control cell phones 70 times a day on average; this time coincides with approximately 1 min every 15 min that they are awake. The excessive use of phones also increases the risk of conflict in daily life. There is a difference between the frequency of telephone usage in social areas of different age groups. In this context, during the time spent with family, the 18–25 age group spent two times more time on the phone compared to the 45–50 age group [2]. For these reasons, the use of smartphones has been a subject of frequent research in recent times.

When the literature is examined, it is seen that these researches have basically been carried out in three different areas. (a) Determining the preferences of users for smartphone selection and reasons for smartphone replacement [3–8] is one of the research areas. (b) Problematic mobile phone use is another area of research [9–15] that is becoming widespread. (c) The most intensive and widespread area of research is the subject of No Mobile Phone Phobia (Nomophobia) [11,16–27]. In the light of these researches and results, it can be argued that the use of smartphones has reached the point where it can compete with other addictions in terms of excessive use intensity, prevalence, and negative emotions in its absence. This has reached the extent that it can affect the daily lives of users, their personal needs, and their interpersonal relationships.

While the use of smart phones makes life easier for the individual, due to overuse, some adverse conditions such as addiction, anxiety, fear, or uneasiness may also eventuate. According to the results of researches, intensive mobile phone usage increases interaction anxiety [28], social anxiety [9,29,30], and shyness [29,31].

Dilbaz [32] found a high correlation between social anxiety and the occurrence of some other psychiatric illnesses. According to the study, there is a high degree of correlation between social anxiety and having disorders such as depression, anxiety disorder, obsessive compulsive disorder, and substance abuse. The individual who is trying to cope with the anxiety she or he experiences in the social environment takes some precautions and the addiction is underlined as one of these precautions. Mobile phone addiction, which is seen as a behavioral dependency, is one of these [30]. Considering the relationship between social anxiety and problematic internet use, it can be argued that socially anxious individuals perceive themselves as more adequate in the internet environment. For socially anxious individuals, this environment is less threatening and more rewarding than face-to-face communication. For this reason, individuals with high social anxiety are more likely to face the negative consequences of overusing the internet [33].

It is inevitable for a person who is a social entity to communicate with other individuals. The fact that the individual is not confident about the impression that he/she will leave on other people when he/she communicates is seen as a symptom of social anxiety. There are researches [9,29,30] that show that there is a positive correlation between the social anxiety experienced by adolescents who excessively use mobile phones and social networks. However, on this content, there are a limited number of studies about prospective teachers who are candidates for a profession that require intensive interaction. For this reason, it is very important to determine the relationship between interaction anxiety and smartphone addiction of prospective teachers who will be role models in terms of their attitudes and behaviors and who train the future generations. The level of social and interaction anxiety is of great importance for prospective teachers as individuals lacking social skills are unable to solve the problems they encounter and, therefore, they can exhibit incompatible behaviors. In this context, the high level of smartphone addiction and interaction anxiety among prospective teachers who are expected to be competent at communication and interaction skills is likely to be a source of trouble for their profession.

In light of all these reasons, the main purpose of this research is to determine the relationship between prospective teachers' smartphone addiction and interaction anxiety. For this purpose, the following questions were asked:

1. What is the level of smartphone addiction of prospective teachers?
2. What is the level of interaction anxiety of prospective teachers?
3. Is there a relationship between prospective teachers' smartphone addiction and their interaction anxiety?

## 2. Method

In this section, the model of the research, the population and the sample, the data collection tools, and the analysis of the data will be given.

### 2.1. Research Model

This research is quantitative descriptive research that was designed within the relational screening model. Quantitative research is defined by Babbie [34] as “the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect”. The relational screening model is a research model which aims to determine the presence and/or level of the change between two or more variables [35]. This study was conducted in order to determine the relationship between prospective teachers’ smartphone addiction and their anxiety for interaction.

### 2.2. Population and Sampling

The population of the research was composed of senior students and pedagogical formation students from İnönü University Faculty of Education in Turkey. The sample consisted of a total of 330 prospective teachers, of which 117 were Faculty of Education students and 213 were pedagogical formation students. The age range of the participants was 20–24, and 120 participants were male and 210 were female students.

### 2.3. Data Collection Tools

The data collection tools that were used in the research consist of (i) the Personal Information Form that was prepared to determine the personal information of the prospective teachers, (ii) the Smart Phone Dependency Scale Short Form to determine the levels of smartphone addiction, and (iii) the Interaction Anxiety Scale to determine the levels of interaction anxiety. The following is a summary of information about the scales that were used as data collection tools.

#### 2.3.1. Smartphone Addiction Scale-Short Version (SAS-SV)

SAS-SV is a measure for the assessment of smartphone addiction that was developed by Kwon et al. [36]. The adaption of the SAS-SV to Turkish was done by Noyan, Enez Darçın, Nurmedov, Yılmaz, and Dilbaz [37]. The SAS-SV is composed of 10 items and is rated by a Likert scale. Scale items are scored from 1 to 6 and the scale scores ranged from 10 to 60. As the score that is obtained from the test increases, the risk also increases for addiction. The scale has one factor and no sub-dimensions. The Cronbach’s alpha coefficient of the scale was 0.867 and had a high reliability. The reliability coefficient of test/retest was 0.926.

The cut-point of SAS-SV  $\geq 31$  and  $\geq 33$  for male and female participants were applied, as suggested by Kwon et al. [36].

#### 2.3.2. The Interaction Anxiousness Scale (IAS)

IAS was constructed by Leary and Kowalski to measure the tendency to feel nervous in social encounters independent of patterns of inhibited, reticent, or avoidant behaviour [38]. It is answered on a five-point Likert type scale ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me). Fifteen items form the scale, including anxiety-evoking situations such as interactions with strangers, parties, dealing with authority figures, cross-sexed encounters, and casual conversation. The items 3, 6, 10, and 15 are reverse-coded items. The total score of the scale ranges from 15 (low social anxiety) to 75 (high social anxiety).

IAS was adapted to Turkish by Coşkun [39]. Items 2, 3, 6, 10, and 15 require reverse coding. High scores indicate an increase in the fear of interaction anxiety. It was administered to 208 students in Abant İzzet Baysal University. Factor analyses have shown that the items of IAS tended to load on a single factor and accounted for 44.44% of the total variance. The coefficients of internal reliability (0.91) and test-retest reliability (0.80) at the three-week periods were found to be at significant levels. Findings have indicated that the validity and reliability scores of IAS were at satisfactory levels in a Turkish student sample.

## 2.4. Analysis of the Data

In the analysis of the data, the standard deviation, frequency, percentage, and arithmetic average of the participants' responses were calculated for each scale. The *t*-test was used in binary comparisons to determine whether there was a significant difference between the smartphone addiction and interaction anxiety of the prospective teachers. The Pearson Moments Multiplication Correlation coefficients were calculated to determine if there was a relationship between prospective teachers' smartphone addiction and their interaction anxiety and also the direction and level of this relationship.

Linear regression analysis was conducted to determine the predictiveness of prospective teachers' interaction anxiety towards smartphone addiction. Before interpreting the analyses, the assumptions of the regression were tested primarily. The data was tested for normality by P-P Plots. Since the points were approaching normal lines, the data was normal. The scatterplot of standardised predicted values versus standardised residuals showed that the data met the assumption of homogeneity of variance and linearity and the residuals were normally distributed. The Durbin-Watson statistic showed that the values of the residuals were independent (Durbin-Watson score was 1.85). It was seen that there were no significant outliers. It was also seen that the data show homoscedasticity. It was checked for multi-collinearity between the dependent variable and the independent variable by using a correlation coefficient. Variance Inflation Factors (VIFs) were calculated. The VIF score and tolerance score were equal to 1. No multi-collinearity was seen. At the final step, it was checked for interaction and it was seen that there were no significant interactions.

## 3. Results

Findings that were obtained in the research are presented in the following headings.

### 3.1. Prospective Teachers' Smart Phone Addiction Level

The lowest and highest scores, arithmetic mean, and standard deviation scores of the scale were calculated on the data that were obtained to determine the level of smartphone addiction of the prospective teachers, and the findings are presented in Table 1.

**Table 1.** Smartphone addiction levels of prospective teachers.

	N	M	SD	Lowest Score	Highest Score
Smartphone Addiction	330	28.22	11.41	10	60

When Table 1 is examined, it is seen that prospective teachers' scores on smartphone use are lower than average.

The *t*-test was conducted to determine whether prospective teachers' levels of smartphone addiction differed significantly according to the "gender" variable, and findings are given in Table 2.

**Table 2.** *T*-test results regarding smartphone addiction levels of prospective teachers by gender variable.

Gender	N	M	SD	df	t	p
Female	210	29.14	11.62	328	1.93	0.053
Male	120	26.62	10.89			

According to Table 2, it is seen that the mean of the female prospective teachers' smartphone addiction is 29.14 and the male prospective teachers' is 26.62. When the table is examined, it is seen that smartphone addiction levels of prospective teachers do not differ significantly according to gender [ $t(328) = 1.93, p > 0.05$ ].

The *t*-test was conducted to determine whether the levels of smartphone addiction of prospective teachers differed significantly in terms of the "faculty" variable and findings are given in Table 3.

**Table 3.** *T*-test results regarding smart phone addiction levels of prospective teachers by the faculty variable.

Faculty	N	M	SD	df	t	p
Education Faculty	117	31.21	11.93	328	3.58	0.000 **
Other Faculties	213	26.58	10.79			

Note. \*\*  $p < 0.01$ .

It was determined that the levels of smartphone addiction of prospective teachers differ significantly according to the faculty variable [ $t(328) = 3.58, p < 0.01$ ]. The mean scores of the smartphone addiction of the prospective teachers studying in the Faculty of Education (31.21) are higher than the prospective teachers who are students of the other faculties (26.58).

### 3.2. Interaction Anxiety Level of Prospective Teachers

The lowest and highest scores, arithmetic mean, and standard deviation scores of the scale were calculated on the data that were obtained to determine the level of interaction anxiety of the prospective teachers, and the findings are presented in Table 4.

**Table 4.** Interaction anxiety level of prospective teachers.

	N	M	SD	Lowest Score	Highest Score
Interaction Anxiety	330	41.28	9.45	15	75

Considering the low and high anxiety scores that can be taken from the scale, it is seen in Table 4 that prospective teachers' scores of interaction anxiety are close to low anxiety.

The *t*-test was conducted to determine whether the level of interaction anxiety of prospective teachers differed significantly in the "gender" variable, and the findings are given in Table 5.

**Table 5.** *T*-test results regarding the interaction anxiety levels of prospective teachers by the gender variable.

Gender	N	M	SD	df	t	p
Female	210	41.72	9.64	328	1.12	0.262
Male	120	40.51	9.08			

When Table 5 is examined, the means of interaction anxiety levels are 41.72 for female teacher candidates and 40.51 for male teacher candidates. It was found that the level of interaction anxiety of prospective teachers did not show any significant difference according to the gender variable [ $t(328) = 1.12, p > 0.05$ ].

The *t*-test was conducted to determine whether the levels of interaction anxiety of prospective teachers differed significantly for the "faculty" variable, and the findings are given in Table 6.

**Table 6.** *T*-test results regarding the interaction anxiety levels of prospective teachers by faculty variable.

Faculty	N	M	SD	df	t	p
Education Faculty	117	40.96	9.91	328	0.46	0.645
Other Faculties	213	41.46	9.20			

As seen in Table 6, the mean score of the interaction anxiety level of the prospective teachers who are students of the Education Faculty is 40.96, and the mean score of the prospective teachers who are students of the other faculties is 41.46. The mean scores of the Interaction Anxiety Scale for prospective teachers did not show any significant difference according to the faculty variables [ $t(328) = 0.46, p > 0.05$ ].

### 3.3. Relationship between Prospective Teachers' Smartphone Addiction and Their Interaction Anxiety

The Pearson Moments Multiplication Correlation coefficients were calculated to determine whether there is a relationship between prospective teachers' smartphone addiction and interaction anxiety. It was found that there was a significant positive relationship between prospective teachers' scores of smartphone addiction and interaction anxiety ( $r = 0.241$ ) ( $p < 0.01$ ).

In this study, the dependent variable was the prospective teachers' interaction anxiety and the independent variable was prospective teachers' smartphone addictions. In order to determine the predictiveness of the prospective teachers' interaction anxiety towards smartphone addiction, the linear regression analysis was used. The findings are shown in Tables 7 and 8.

**Table 7.** The results of the ANOVA for the regression of prospective teachers' smartphone addiction and interaction anxiety.

Source	df	Sum of Squares	Mean Square	F	<i>p</i>
Between groups	1	1702.96	1702.96	20.178	0.000 **
Within groups	328	27,681.83	84.40		
Total	329	29,384.80			

Note. \*\*  $p < 0.01$ .

As shown in Table 8, it was found that prospective teachers' smartphone addiction was a significant predictor ( $R = 0.241$ ,  $R^2 = 0.058$ ,  $p < 0.01$ ) of prospective teachers' interaction anxiety. In other words, the results indicated that prospective teachers' smartphone addiction explained about 6% of the total variance in the prospective teachers' interaction anxiety.

**Table 8.** The predictiveness of prospective teachers' interaction anxiety.

Variable	B	SE B	$\beta$
Constant	35.657	1.351	
Smartphone addiction	0.199	0.044	0.241 **

Note.  $R^2 = 0.058$ . \*\*  $p < 0.01$ .

## 4. Discussion

Communication and communication tools are important for almost every human being. For this reason, it is the basic aim of the mobile phones which have the most common usage area to make it easy for every individual to reach any information that she or he wants. From this point of view, this research was conducted as quantitative research within the relational screening model to determine the relationship between prospective teachers' smartphone addiction and their interaction anxiety. Data were obtained via The Smartphone Addiction Scale-Short Version (SAS-SV) and The Interaction Anxiousness Scale (IAS). The research results were gathered by analysing the opinions of 330 prospective teachers who consisted of senior students (117) and pedagogical formation students (213) of İnönü University Faculty of Education who responded to these scales in accordance with the directive.

As a result of the research, it was determined that prospective teachers' mean scores for smartphone use were lower than average. It was determined that the total mean of the smartphone addiction level of the students is 29.10 in the result of the study titled "A study to determine the smart phone addiction levels of the Computer Education and Instructional Technologies (CEIT) teacher candidates" conducted by Çalışkan, Yalçın, Aydın, and Ayık [40]. This result was described by the researchers as a tendency for prospective teachers to have a moderate smartphone addiction. On the other hand, Çakır and Oğuz [41] determined the mean score of the high school students' smartphone addiction scale as 90.03 in the study titled "The relationship between loneliness levels of high school students and smartphone addiction". Researchers have interpreted this result as high school students having moderate smartphone addiction. All three studies that were conducted in Turkey in 2017



yielded similar results. When the scale scores for determining addiction are taken into consideration, these results that are close to the average can be evaluated as the expected results. The intensive use of mobile phones by prospective teachers may have resulted in this. It can be stated that although the prospective teachers are below the moderate level of smartphone addiction, they cannot be regarded as dependent, however they are still in the risk group. In the struggle against smartphone addiction, which is one of the most widespread and increasingly anxiety-related addiction types of our future, these results can be the basis for research-based actions.

In the study, it was determined that the mean of the female prospective teachers' level of smartphone addiction (29.14) was higher than the males (26.62). However, in terms of gender, the results also show that the smartphone addictions of prospective teachers did not show a statistically significant difference. In the field, it is seen that similar researches have reached different results. It has been determined that there is not any statistically significant difference in smartphone addiction in terms of gender in the studies that were conducted by Çalışkan, Yalçın, Aydın, and Ayık [40], Çetinkaya Bozkurt and Minaz [42], and Kuyucu [43]. On the other hand, in the studies that were conducted by Aktaş and Yılmaz [44], Ay [45], Çakır, and Oğuz [41], Deursen, Bolle, Hegner, and Kommers [46], Jiang and Zhao [11], and Lin and Chiang [12], females' smartphone addiction levels were found to be statistically significantly higher than males. Although there is no research result that males are more addicted to smartphones than females, literature has not reached a clear agreement that gender may influence smartphone addiction. One of the main reasons why smartphone addiction does not vary by gender is that there may not be a sex specific difference in the ability to acquire and use smartphones. However, from the point of view of use, the situation is different. In a study conducted with university students [47], it was found that in terms of daily mobile phone usage times, short message (SMS) receiving and sending rates, changing Global System for Mobile Communications (GSM) operator, audio-video sending photos, listening to music, radio listening, and calendar-hour-calculator, females have higher rates than males [47] (pp. 168–170). Especially, the restrictive and obstructive situation that arises against women with the imposition of individual, cultural, and traditional roles has a tendency to lose its influence and move towards extinction with the development of technology and the possibilities it creates. Smartphones, which are becoming increasingly widespread and are expanding in usage, are one of the leading innovators in preventing these obstacles. The limitless possibilities of smartphone use can be argued as one of the reasons why the use of smartphones in particular by women is increasing. The possibilities created by smartphones and their future boundaries that have not yet been predicted can be argued as a reason for increasing the excessive use of smartphones for women who are more in need of these opportunities. Regardless of whether they are women or men, having a mobile phone is means "to control their communication channel" in terms of young people, according to Ling [47]. While mobile phones provide an independent communication network for young people, they are able to share many kinds of special information through this tool by reaching all kinds of information at the same time [47] (p. 87).

Another result of the research is that the prospective teachers' interaction anxiety scores are close to low anxiety. In the study that was conducted by Özgür [28], it was determined that the prospective teachers' interaction anxiety score was above average. The reason for the difference in outcomes may be that the prospective teachers are at different grade levels in both studies. In this study, the opinions of senior students were taken, while in the other study that was mentioned, the opinions of students at different grade levels were taken. The fact that senior students feel less anxious to interact than first, second, and third-grade students can be interpreted as the fact that the training they receive at Education Faculties contributes to reducing this interaction anxiety. In addition, it was determined that the mean score of female prospective teachers' anxiety level of interaction was higher than that of males. However, this is not a statistically significant difference. In the research that was conducted by Özgür [28], it was concluded that the male prospective teachers' anxiety of interaction was higher than the females. The finding that prospective teachers are not having a high level of interaction anxiety

can be viewed as a positive situation for candidates with an intense interaction profession. Prospective teachers who are expected to interact intensely not only with their students but also with colleagues, administrators, and other components of the school during their teaching profession are expected to not have this concern.

Finally, it was concluded that there was a statistically significant positive correlation between prospective teachers' level of smartphone addiction and interaction anxiety level scores. Similar results were obtained in the research that was conducted by Lee, Chang, Lin, and Cheng [48]. These results show that smartphone addiction and interaction anxiety, which should not be high in prospective teachers, affect each other. A positive improvement in one of the smartphone addiction or interaction anxiety variables may also produce a similar positive result on the other. As a result of their research that was carried out among American college students, Cheever, Rosen, Carrier, and Chavez [49] indicate that heavy and moderate wireless mobile device, including smartphone, users felt significantly more anxious when the device was absent. According to Caplan's theory that is based on the cognitive behavioural model, individuals with high levels of social anxiety and inadequate social skills are more likely to use the internet problematically [33]. Besides, the results indicated that prospective teachers' smartphone addiction explained about 6% of the total variance in the prospective teachers' interaction anxiety. These results reveal the necessity of careful consideration of these variables so that the prospective teachers can make their profession more effective when they become teachers. The purpose of using internet is one of the determinants of problematic use. Apart from acquiring information, especially using internet for social relations and enjoyment with people they do not particularly recognise increases the level of problematic internet use. When social relations and problematic internet use variables are examined together, it is seen that individuals with limited social life competence use the internet more problematically [33]. Individuals who have low self-expression ability prefer online communication instead of face to face communication. According to this, individuals who feel discomfort from general situations tend to prefer online social interaction, which increases internet dependency [50]. The negative effect of the usage of smartphones or other technologies on academic performance could be due to their "excessive" use [51].

To most smartphone users, a smartphone is not a device just for calling, however it is also a friend because it brings them fun, relieves their exhaustion and anxieties, and makes them feel safe [52]. One of the dimensions of internet addiction is usage of the internet for social comfort. This is described as using the internet to seek social comfort and a disposition towards using online social interaction to replace real-life interpersonal activities [53]. One of the dimensions of smartphone addiction is cyberspace-oriented relationships. This dimension includes questions about the feeling that one's relationships with his or her friends obtained through a smartphone or internet are more intimate than his or her relationships with his or her real-life friends [52]. These dimensions of smartphone and internet addiction focuses on the same subject—cyber world interactions are more preferable than real world interactions. According to the results that were obtained in this research, 6% of the individuals' interaction anxiety is explained by smartphone addiction. Considering the dimension of smartphone addiction mentioned above, the disturbance experienced by an individual who thinks he or she is going to be exposed to face to face interaction raises the anxiety of interaction.

Despite the high rate of smartphone addiction, there has not been sufficient research conducted about this phenomenon among young adults [54]. The use of smartphones is increasingly becoming more and more common, and the lack of it is causing discomfort and worry for people. For this reason, before smartphone use reaches the level of other addiction types, necessary precautions must be determined and applied without losing time. For this purpose, the awareness of prospective teachers can be increased that the use of smartphones may become addictive. They can be informed and supported on this addictiveness, how they can cope with it, and how they can get it when they need professional help. On the other hand, precautions must be taken to reduce the concerns of prospective teachers. Especially the lessons of School Experience and Teaching Practices can be considered in this way. Students can be encouraged to organize and participate in more social events. Student clubs can



be used for this purpose. Counselling and guidance services can be disseminated at universities to provide psychological support in cases where it is necessary to cope with anxiety or addiction. Course contents and teaching methods can be enriched in the direction of smartphone usage and interpersonal relations, communication, and social skills.

In this study, variables of smartphone addiction and interaction anxiety were examined according to perceptions of prospective teachers. In subsequent studies, the factors affecting these two variables can be investigated by qualitative methods. The results can be compared with the results of other countries. Other variables with which these variables are related can also be examined.

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