

EXPLORING THE RELATIONSHIP BETWEEN COLLEGE STUDENTS' MOBILE  
PHONE AFFINITY AND THEIR MOBILE PHONE USAGE

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**EXPLORING THE RELATIONSHIP BETWEEN COLLEGE STUDENTS'  
MOBILE PHONE AFFINITY AND THEIR MOBILE PHONE USAGE**

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## ABSTRACT

### EXPLORING THE RELATIONSHIP BETWEEN COLLEGE STUDENTS' MOBILE PHONE AFFINITY AND THEIR MOBILE PHONE USAGE

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Mobile phones have become a part of our everyday life thanks to being used anytime and anywhere. They offer many features to users, which have turned them into devices that used for much more than calling and messaging. Moreover, previous studies indicate that mobile phones have drawbacks for users as well as benefits. Users have become addicted to their mobile phones and they experience negative emotions in case of separation from them. In addition, the use of mobile phones directly/indirectly affects the academic performance of college students which results in the decline of academic achievement. Thus, there is a need for studies that examining the mobile phone usage behaviors of college students. This study is a Casual-Comparative research which aims to investigate the extent of the relationship among students' mobile phone affinity and their gender and type of their mobile application usage. The data was collected via Internet as an online survey which consists of Mobile Phone Affinity Scale and Student's Demographic Information from 252 participants aging 19 to 29. In addition to this, the data was collected over the course "Introduction to Information Technologies and Applications" which is an online undergraduate course at METU introducing basic information technology concepts and applications. As a result of the study it has been found that females use mobile phones more than males on three dimensions; Addiction, Anxious Attachment, and Empowerment. Additively, students who use Social Media mobile app reported more mobile phone usage in terms of Connectedness, Anxious Attachment, and Addiction.

**Keywords:** mobile phone usage, mobile phone affinity, mobile applications

## ÖZ

### ÜNİVERSİTE ÖĞRENCİLERİNİN MOBİL TELEFON KULLANIMLARI İLE MOBİL TELEFON İLGİNLİKLERİ ARASINDAKİ İLİŞKİNİN KEŞFEDİLMESİ

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Mobil telefonlar her an ve her yerde kullanılabilmeleri sayesinde günlük hayatımızın bir parçası haline geldi. Kullanıcılara çeşitli özellikler sunarak arama ve mesajlaşma özelliklerinden çok daha fazlasını sağlayan cihazlara dönüştüler. Ayrıca önceki çalışmalar, mobil telefonların avantajları olduğu kadar dezavantajları olduğunu da göstermektedir. Kullanıcılar cep telefonlarına bağımlı hale geldiler ve mobil telefonlarından ayrı kaldıklarında negatif duygular hissediyorlar. Buna ek olarak, mobil telefon kullanımı üniversite öğrencilerinin akademik performansını doğrudan/dolaylı etkileyerek akademik başarılarının düşmesine neden olmaktadır. Yine de üniversite öğrencilerinin mobil telefon kullanım davranışlarını inceleyen çalışmalara ihtiyaç vardır. Bu çalışma, öğrencileri cinsiyeti ve kullandıkları mobil uygulama türleri ile mobil telefon ilginlikleri arasındaki ilişkinin derecesini araştırmayı amaçlayan Nedensel- Karşılaştırma araştırmasıdır. Veriler internet üzerinden Mobil Telefon İlginlik Ölçeği ve Öğrencilerin Demografik Bilgilerinden oluşan bir anket ile 19-29 yaşları arasındaki 252 katılımcıdan toplandı. Buna ek olarak veriler, ODTÜ’de çevrimiçi bir lisans dersi olan ve öğrencilere temel bilgi teknolojisi kavramlarını ve uygulamalarını tanıtan “Introduction to Information Technologies and Applications” dersi üzerinden toplandı. Çalışma sonucunda kadınların mobil telefonlarını Bağımlılık, Kaygılı Bağlanma ve Güçlendirme yönlerinden erkeklerden daha fazla kullandıkları tespit edilmiştir. Ayrıca, sosyal medya mobil uygulaması kullanan öğrenciler Bağlanabilirlik, Kaygılı Bağlanma ve Bağımlılık yönlerinden daha fazla cep telefonu kullandığını bildirdiler.

**Anahtar Sözcükler:** mobil telefon kullanımı, mobil telefon ilginliği, mobil uygulamalar

To My Family



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## LIST OF ABBREVIATIONS

<b>app</b>	Application
<b>apps</b>	Applications
<b>GB</b>	Gigabyte
<b>GPA</b>	Grade Point Average
<b>ICTs</b>	Information and Communication Technologies
<b>IS</b>	Information Systems
<b>IS100</b>	Introduction to Information Technologies and Applications
<b>M</b>	Mean
<b>Max.</b>	Maximum
<b>METU</b>	Middle East Technical University
<b>Min.</b>	Minimum
<b>MPAS</b>	Mobile Phone Affinity Scale
<b>n</b>	Sample size
<b>N</b>	Number
<b>PC</b>	Personal Computer
<b>REGWQ</b>	The Ryan, Einot, Gabriel and Welsch Q procedure
<b>SAT</b>	Scholastic Aptitude Test
<b>SD</b>	Standard Deviation
<b>Sig.</b>	Significance
<b>SNS</b>	Social Networking Services
<b>SPSS</b>	Statistical Package for the Social Sciences
<b>Std.</b>	Standard
<b>Wi-Fi</b>	Wireless Fidelity



## CHAPTER 1

### INTRODUCTION

In early 2000s, people had to sit down at a computer (which has an internet connection) to be able to fulfill the tasks related with internet. As mobile phone (cellphones, including smartphones) ownership has grown increasingly in recent years (Anderson, 2015; Kemp, 2017), the act of going online has changed significantly. Today, mobile phones are the most used devices to access the web with a 30% dramatic increase in a year when compared with Laptops/Computers and Tablet devices (Kemp, 2017). Online services and information has become accessible with mobile phones (especially with smartphones) throughout the day, whenever and wherever it happens to be. Moreover, mobile phones offer many features to users including followings; making call, sending message, taking/sharing photos, watching/sharing videos, setting alarm, taking notes, reading/sending e-mails, using calendar, keeping track of appointments, surfing the net, checking news, doing online banking, making voice search, recording voice, listening music, playing games, connecting to the social network sites, and using chat to make voice calls. The results of a recent survey study showed that the most widely used four features of smartphones are text messaging (97%), video calls (82%), internet use (89%), and using e-mail (88%) among eleven features (Smith, McGeeney, Duggan, Rainie, & Keeter, 2015). After these big four smartphone features, participants respectively prefer to use social networking, take pictures/video, check news, watch video, play games, use map, and listen music or make podcast (Smith et al., 2015).

For Turkey, 86% of population own a mobile phone whereas 56% of them use a smartphone (Kemp, 2016). 90% of mobile phone owners have a mobile internet connection, and 51% of them are active mobile internet users (Kemp, 2016). 86% of active social media users prefer to connect to the social media sites with their mobile phones (Kemp, 2016). Moreover, they mostly prefer to use Facebook as a social media platform which used by 32% of Turkish citizens in 2016 (Kemp, 2016). In addition to Facebook, Twitter (17%), Instagram (16%), Google+ (15%), LinkedIn (9%) and Vine (7%) consist the most used social platforms in Turkey (Kemp, 2016). Furthermore, Turkish people mostly use WhatsApp as messaging app with a 24% user rate, and Facebook Messenger is the second most used chat app even if Facebook is the most

preferred social media platform (Kemp, 2016). In addition to these, Turkish people mostly use mobile phones to message via messaging apps, watch videos, play games, use mobile banking and mobile map services (Kemp, 2016).

In addition to common benefits of mobile phones (e.g., connecting people with each other via voice calls or messaging, providing immediate access to the information), mobile phones can be a good coaching system for users to increase their physical activity; mobile phone apps can be used whenever and wherever users want, and they provide users opportunities on planning, measuring and monitoring their sport activities (Mollee, Middelweerd, Kurvers, & Klein, 2017). Several studies reported that mobile phone apps were used as a support tool for chronic diseases and rehabilitation programs, and health professionals used support programs to check the progress of their patients (Bort-Roig, Gilson, Puig-Ribera, Contreras, & Trost, 2014). Several researchers found that mobile phone app users decreased their weight and body fat (Bort-Roig et al., 2014), and increased their physical activity in terms of steps count per day (Bort-Roig et al., 2014; Kamboj & Krishna, 2017).

Despite the benefits of mobile phone use, more research has been done and published recently on drawbacks. Studies show that people have become emotionally attached to their mobile phones (Hoffner, Lee, & Park, 2015; Sapacz, Rockman, & Clark, 2016; Silva, 2012), and they have mostly experience negative emotions (lonely, disconnected, anxious, vulnerable, sad, depressed, angry, annoyed, and bored) in case of loss/separation from their mobile phones (Hoffner et al., 2015). Moreover, researchers found that people have become addicted to their mobile phones (Chen & Leung, 2016; Chen et al., 2017; Jeong, Kim, Yum, & Hwang, 2016; Kim, Kim, & Jee, 2015; Lee, 2015; Lee, Chang, Lin, & Cheng, 2014; Lopez-Fernandez et al., 2017; Milosevic-Dordevic & Žeželj, 2014; Oulasvirta, Rattenbury, Ma, & Raita, 2012; Pawłowski & Potembska, 2011; Sapacz et al., 2016; Seo, Park, Kim, & Park, 2016; Tan, Pamuk, & Dönder, 2013; Walsh, White, Cox, & Young, 2011), which can result in experiencing stress, anxiety, and depression (Lee et al., 2014; Lepp, Barkley, & Karpinski, 2014; Samaha & Hawi, 2016; Seo et al., 2016).

Also, use of mobile phones at bedtime are harmful our sleep and it has been associated with various health problems. It decreases the sleep quality (Exelmans & Van den Bulck, 2016; Lemola et al., 2015; Thomée et al., 2011), increases fatigue and daytime sleepiness (Exelmans & Van den Bulck, 2016; Nathan & Zeitzer, 2013; Saling & Haire, 2016), causes insomnia (Exelmans & Van den Bulck, 2016), stress, anxiety, and depression (Lemola et al., 2015; Saling & Haire, 2016; Thomée et al., 2011).

Finally, College students' academic performance was negatively related to mobile phone usage. That is, mobile phone use directly/indirectly affects the academic performance in a way that resulting in decrease of academic achievement (Harman & Sato, 2011; Kibona & Mgaya, 2015; Lepp et al., 2014; Samaha & Hawi, 2016; Seo et al., 2016; Wentworth & Middleton, 2014). Multitasking, doing more than one thing at the same time (Wood et al., 2012), also one of the major factor affecting students' academic performance (Junco & Cotten, 2012). Moreover, mobile phone multitasking

impact students' learning from a variety of basis including distraction sources (ring of mobile phone, texting, ICT use), distraction targets (reading, attention), and distraction subjects (personality, gender, culture and information motives) (Chen & Yan, 2016).

Yet as with any type of technology, the way of use is an important factor in determining the results of use. Also, the needs that mobile phone fulfils can vary person to person, and so people may vary according to the mobile phone use they value most.

### **1.1. Purpose of the Study**

The purpose of this study is to examine the mobile phone usage behaviours of college students in Turkey, and explore how they differs in usage behaviour. Moreover, it aims to investigate the relationship between their mobile phone usages and their mobile phone affinity.

### **1.2. Research Questions**

In accordance with the purpose of the study, the following research questions were addressed:

1. What are the mobile phone usage patterns of college students?
2. Is there a difference in college students' mobile phone affinity scores regarding to their gender?
3. Is there a relation between college students' mobile phone affinity scores and type of their mobile application use?

### **1.3. Assumptions**

There is only one assumption for the research presented in this paper. That is, it is assumed for the research that the undergraduate students of Middle East Technical University represents the population, college students in Turkey.

#### 1.4. Significance of the Study

This study aims to contribute to literature about mobile phone research by providing data about college students' behaviour on mobile phone usage, which can be beneficial for researchers interested in mobile phone researches and studies investigating the impact of technology on people's lives. Also, the findings of the study may inform mobile phone application developers about existing mobile usage behaviours of college students in Turkey. Moreover, the conclusions drawn from the results can help instructors on understanding students' mobile phone usage behaviours, if they want to integrate mobile phone use efficiently into their lessons.

#### 1.5. Definition of Terms

The terms commonly used in the research are as follows.

- **Addiction** is “continuous and excessive engagement in a behaviour (e.g., gaming, gambling, shopping) resulting in unawareness of one's life responsibilities (e.g., work, homework, relationships)” (as cited in Seo et al., 2016, p. 283).
- A **sampling frame** is “a list of the population members” (Sue & Ritter, 2007, p.26).
- **Habitual checking**, or a checking habit, is defined as “repetitive inspection of dynamic content quickly accessible on the device” (Oulasvirta, Rattenbury, Ma, & Raita, 2012, p. 105).
- **Questionnaire** is “a very concise, preplanned set of questions designed to yield specific information to meet a particular need for research information about a pertinent topic” (Key, 1997, para. 2). In addition, A **questionnaire** defined as “a written collection of survey questions to be answered by a selected group of research participants” (Gay et al., 2009, p. 176).
- **Multitasking** simply refers to “doing more than one activity simultaneously” (Wood et al., 2012, p. 366). It is defined in detail as “divided attention and non-sequential task switching for ill-defined tasks as they are performed in learning situations” (Junco & Cotten, 2012, pp. 505-506).
- **Sampling clusters** are preexisting groups in a population (Sue & Ritter, 2007, p. 169).
- **Survey** is “a system for collecting information”(Sue & Ritter, 2007, p. 1). Moreover, a **survey** is defined as “an instrument to collect data that describes one or more characteristics of a specific population.”(Gay, Mills, & Airasian, 2009, p. 175).

## **1.6. Thesis Outline**

This chapter provides a road map for the rest of the research presented in this thesis. That is, it outlines the purpose and significance of the research, and states the research questions. Moreover, it presents the definition of the terms commonly used throughout the research, and states the assumptions. The following chapter, Chapter 2, presents a summary of the researches from relevant literature. In Chapter 3, the methodology that adopted for the research study are explained in detail with data collection instruments and data collection procedures. In addition, data analysis methods which are used to analyse collected data are explained in this chapter. Also, the information about ethics issues about this research are presented. For Chapter 4, findings from the research were stated in detail. And the final chapter, Chapter 5, states the discussion of the results of the research, presents the limitations of the study, and gives directions for future researches.



## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter states the researches related to mobile phone usage and discusses relevant literature. The first section reviews the studies presenting usage statistics of mobile phone in terms of ownership, mobile phone usage purposes, mobile applications and games. The second section briefly summarize the common benefits of mobile phone use and provides available studies investigating the positive effects of mobile phones on users' physical activity. Lastly, the third section presents recent studies reported the drawbacks of mobile phone use in terms of addiction, sleep problems, or academic performance.

#### **2.1. Mobile Phone Usage Statistics**

Today, mobile phone (cellphones, including smartphones) ownership has surpassed ownership of the tablet computer, desktop/laptop computer, e-book reader, game console, portable gaming device, and MP3 player (Anderson, 2015). 92% of U.S. adults have a cell phone while 68% of them use a smartphone (Anderson, 2015) and ownership of smartphones increased sharply from 35% in 2011 to 68% in 2015 (Anderson, 2015). Also, Digital in 2017 Global Overview report of We Are Social indicates that 66% of the world uses mobile phone whereas more than 50% of the world is a smartphone user (Kemp, 2017). Moreover, according to another international report, the average world penetration rate of mobile phones was 96.2% in 2013 and it has been approaching 100% in many countries (Internet World Stats, 2017). In addition to these, age group with the most smartphone owners is 18- to 29-year-old adults with 86% of smartphone ownership in 2015, indicating that smartphone owners are more likely to be younger (Anderson, 2015).

Mobile phones can be used for a wide range of purposes whenever and wherever they are. Especially with a smartphone, a person can make call, send message, take/share photos, watch/share videos, play games, listen music, record voice, use voice search, set alarm, read/send e-mails, take notes, use calendar, surf the internet, check news, learn weather, do online banking, use chat apps (e.g., WhatsApp) to make voice calls,

and connect to the social network sites (e.g., Facebook). According to a recent survey study done with 2.188 smartphone owners by completing a series of short surveys twice a day in a week, the most widely used four features of smartphones are text messaging, video calls, internet use, and using e-mail with a user rate in percentage 97, 92, 89, and 88 respectively (Smith et al., 2015). In addition, these big four smartphone features are widely used by the users from a wide range of age groups consisting of 18-29, 30-49, 50 and older (Smith et al., 2015). Additively, after these big four smartphone features, social networking (75%), taking pictures/video (60%), checking news (55%), watching video (50%), playing games (47%), using map (45%), listening music or podcasting (41%) form the widely used smartphone features (Smith et al., 2015).

Mobile applications are also one of the factors that play an important role in the use of mobile phones. To exemplify, for Facebook, 1.15 billion (on average for December 2016) users connected to the service with a mobile device, which increased 23% in a year (Park & February, 2017). In addition, mobile daily active users account for 95% of daily active users; that is, 1.15 billion daily active users out of 1.23 billion use mobile devices to access to the service (Park & February, 2017). Also, according to the statistic of We Are Social at Digital in 2017 Global Overview report, monthly active users of most active social media platforms consist 37% of the world population, whereas 34% of them are active mobile social users accessing to the platforms via mobile phones (Kemp, 2017). As another example, 51% of Americans have ever bought something online by using a mobile phone while 15% of them have followed a social media link (a link on a social media site such as Facebook) to purchase something online (Smith & Anderson, 2016). Especially, 18- to 29-year-old adults tend to use mobile phones to buy something online; that is, 77% of 18- to 29-year-old adults (out of 90% of participants who have ever made online shopping) have purchased something online (Smith & Anderson, 2016). However, 17% of 65-year-old and older participants have ever made online purchases with their mobile phones (Smith & Anderson, 2016). In addition to these examples, from another survey study with 2001 adults, 12% of participants have ever used an online dating site whereas 9% of them have ever used a dating app on their mobile phone (Smith, 2016).

Moreover, mobile messaging apps appeal to smartphone owners and become popular especially among younger adults. According to a recent survey study that 72% of American adults who own a smartphone participated, 56% of 18- to 29-year-old participants use auto-delete apps such as Snapchat, and 42% of them use general-purpose messaging apps such as WhatsApp (Greenwood, Perrin, & Duggan, 2016). Unlike younger adults, participants ages 30 or older prefer to use general-purpose messaging apps more than auto-delete apps (Greenwood et al., 2016). Additively, older adults not much prefer to use messaging apps. That is; 19% of adults ages 50 and older use general-purpose messaging apps while auto-delete apps were used by 9% of these adults (Greenwood et al., 2016).

Furthermore, mobile games can be attractive for gamers thanks to being played anytime at anyplace (Bowman, Jöckel, & Dogruel, 2015). For instance; the estimated



Pokémon Go daily number of users changed from 9 to 21 million people, and thousands of new users started to play the game every day (as cited in Kamboj & Krishna, 2017).

Finally, Digital in 2016 report of We Are Social presents the mobile phone usage statistics of Turkey as below (Kemp, 2016).

- 86% of population has mobile phones and 56% of them owns a smartphone. In addition, the ownership rate of laptop/computer (48%) or tablet devices (11%) are rather low compared to the mobile phones.
- 90% of the population (71.03 million users from 79.14 million) has mobile connectivity.
- 40.5 million of the population are active mobile internet users, which make up 51% of 58% active internet users.
- The average daily time spent on the internet via a mobile phone is 2 hours 35 minutes.
- 86% of active social media users (36 million users from 42 million) connect to the platforms with a mobile phone, which has increased 13% since 2015. Moreover, active social mobile media users account for 45% of the total population.
- Facebook is the most used social media platform in 2016 with 32% of user rate, and it is mostly preferred by users ages 20 to 29. After Facebook, Twitter (17%), Instagram (16%), Google+ (15%), LinkedIn (9%) and Vine (7%) are the most used social platforms in Turkey.
- WhatsApp is the most preferred messaging app with a 24% user rate. It is followed by Facebook Messenger with usage rate of 20%. Skype is the third most used chat app which was used 13% of the population in 2016.
- 24% of the population made an online purchase with their mobile phones in a month.
- Turkish people use mobile phones for the following purposes at the specified percentages; messaging via mobile messengers (43%), watching videos (36%), playing games (28%), using mobile banking (35%), and using mobile map services (37%).

## **2.2. Benefits of Mobile Phone Use**

Mobile phones can connect people (friends, family members etc.) with each other even if they are separated by long distances by providing access via messages or voice calls. Moreover, mobile phones can give people confidence because they provide immediate access to authorized people (emergency police, fire brigade, ambulance etc.) for requesting help wherever and whenever they are needed. In addition, people can remain in contact with others whose phone number has not been known by using social networking sites (e.g., Facebook) on mobile phones. They can also share information/ideas/emotions/photos from mobile phones via social network sites without having to use a computer in a certain place. Furthermore, with the provision of internet access via mobile phones, online services have become accessible from mobile phones through the day. For example; a person can do most of banking transactions at any time with a mobile phone having internet access without need to go to the bank and without having to use a computer. As another example, a person can shop online with mobile phones having internet access if s/he cannot find the product s/he is looking for in the store or s/he does not have enough time to go to the store for shopping. In addition to these, mobile phones offer many features to the users through mobile applications. That is, a person can play games, listen music, take notes, edit photos, watch videos, record sounds, read eBooks/news, and record physical activities (e.g., walking, running, swimming).

### *2.2.1. Physical Activity*

Health & Fitness apps are popular between smartphone apps and they are on the ninth place on iTunes in terms of apps number (Steel Media Ltd, 2017). To be more precisely, iTunes contains 93,428 health and fitness apps which account for 2.98% of total apps in 2017 (Steel Media Ltd, 2017).

Smartphone apps can be a good mobile coaching system that encourages people to do sports; they can provide opportunities to their users on planning sport activities, and self-monitoring their activity data which can be obtained via user input or sensors. Researchers reviewed Google Play Store and iTunes App Store in order to examine smartphone apps promoting physical activity in terms of five features named as Measuring and Monitoring, Information and Analysis, Support and Feedback, Adaptation and Social (Mollee et al., 2017). That is, they score the apps according to their data receiving and analyzing features, the way they provide support to the users, apps adaptation features to the users, and their ability supporting social media (Mollee et al., 2017). As a result, they reported that Measuring and Monitoring, Information and Analysis, and Support and Feedback were the features mostly integrated into smartphone apps; that is, these features were found between 141 to 161 apps (Mollee et al., 2017). However, social feature was found 121 apps whereas Adaptation was scored only in 7 apps (Mollee et al., 2017).

Moreover, researchers systematically reviewed studies about smartphone use for physical activity measurement published in 2017-2013 from the databases, EBSCO,

PsycINFO, PubMed, ScienceDirect, Scopus, and Web of Knowledge (Bort-Roig et al., 2014). The results revealed that 12 studies were about chronic diseases, and rehabilitation programs for overweight and obesity (Bort-Roig et al., 2014). Four researches reported that weight and body fat of app users were decreased (Bort-Roig et al., 2014). In addition, 3 researchers reported that apps can be used as support programs providing health professionals to check the progress of their patients (Bort-Roig et al., 2014). Furthermore, results of 3 researchers indicated that app use increase physical activity in terms of steps count per day (Bort-Roig et al., 2014).

In addition to these, Pokémon Go caused a total of 4.6 billion kilometers of walk in 2 months after its release to the gamers, which indicate the walk of more than the distance between Sun and Neptune (Kamboj & Krishna, 2017).

### **2.3. Drawbacks of Mobile Phone Use**

Like other technologies, mobile phones can do as much harm to users as they can benefit. The following subsections present the recent researches from literature examining the drawbacks of mobile phone use in terms of addiction, sleep problems, and academic performance.

#### *2.3.1. Addiction*

In general, addiction is “a behavior, a habit, which is hard to be removed because it is strictly related to the search of pleasure through a process often aimed at reducing a deep malaise” (Salicetia, 2015, p. 1639). Also, the behaviors related to common activities (such as work, games, shopping, sport, internet, and mobile phone use) that giving answers to the needs of human can turn into toxic substance-free addiction (Salicetia, 2015).

The definition of the term addiction used in this research is “continuous and excessive engagement in a behaviour (e.g., gaming, gambling, shopping) resulting in unawareness of one’s life responsibilities (e.g., work, homework, relationships)” (as cited in Seo et al., 2016, p. 283). As inferred from its definition, people can be addicted to the content that smartphones provided (Jeong et al., 2016; Lopez-Fernandez et al., 2017). In addition, previous researches showed that people can be addicted to contents such as games (Chen & Leung, 2016; Jeong et al., 2016; Lopez-Fernandez et al., 2017; Spekman, Konijn, Roelofsma, & Griffiths, 2013) and social networking services (Jeong et al., 2016; Lee, 2015; Lopez-Fernandez et al., 2017; Milosevic-Dordevic & Žeželj, 2014). Moreover, because of the ability to accessing the mobile phones (and the content mobile phones provide) wherever users want, researchers discovered that habitual checking can lead to smartphone addiction. (Oulasvirta et al., 2012).

The factors leading to smartphone usage and addiction may vary according to culture and geographical differences. Lopez-Fernandez et al. (2017) surveyed 2.775 adults aging 18-29 from several European universities (located in Finland, UK, Spain, Italy, Hungary, Poland, France, Belgium, Germany, and Switzerland) in order to investigate

how mobile phone dependence can be predicted by mobile phone usage patterns, socio-demographic factors, and geographical differences. Researchers reported that gaming, social networking and watching TV exhibited the strongest effect on perceived dependence of mobile phones in all countries, which are followed by messaging and chatting, e-mailing, and searching information (Lopez-Fernandez et al., 2017). Moreover, researchers also revealed that Belgium, UK and France (countries using mobile phones for communication purposes; messaging and chatting, or social networking) had highest mobile dependency rate (Lopez-Fernandez et al., 2017).

Although females tend to be addicted to smartphones more than males (Kim et al., 2015; Lee, 2015; Lopez-Fernandez et al., 2017; Pawłowska & Potembska, 2011; Seo et al., 2016), smartphone addiction may vary according to the gender; females and males can perceive smartphones usage differently. Chen et al. (2017) examine the role of gender characteristics leading to smartphone addiction in terms of perceived enjoyment, social relationship, mood regulation, pastime, and conformity. They pointed that although mood regulation has the strongest effect on smartphone addiction, all motives except social relationship can cause addiction both males and females (Chen et al., 2017). Additively, they revealed that the effects of conformity on smartphone addiction is stronger for males whereas perceived enjoyment and pastime exert a stronger effect on females (Chen et al., 2017). That is, female adults perceive smartphone use enjoyable and they prefer to occupy their free time with smartphones while males use smartphones more to gain identification from their friends (Chen et al., 2017).

In addition to the gender difference, individual characters can also play an important role on being addictive to smartphones. Jeong et al. (2016) revealed that adolescents with low self-control ability or higher stress were more likely be addicted to the smartphones. Additively, several researchers reported that those who experienced social anxiety tend to compulsively use mobile phones (Lee et al., 2014; Sapacz et al., 2016). However, Elhai et al. (2017) pointed that adults with higher level of depression and anxiety were not likely to use social features of smartphones (e.g., social media use). That is, adults avoid social interaction which can be associated with stress if they feel anxiety or depression. Furthermore, Tan et al. (2013) discovered that college students who felt loneliness were more likely to be addictive to mobile phones. In addition to these, Walsh et al. (2011) found that young adults with self-identity and in-group norms highly involved in mobile phone usage. In other words, those who perceived mobile phone use an important part of their self-concept and accepted usage of mobile phones as a common behaviour among their group friends had higher mobile involvement score.

Recent studies have positively associated smartphone addiction to stress, anxiety, and depression. According to the study of Samaha and Hawi (2016), college students diagnosed with high smartphone addiction experienced higher level of perceived stress. In the study of Lepp, Barkley and Karpinski (2014) with undergraduate college students, it is found that students with high frequency cell phone usage tend to have high level of anxiety. Seo et al. (2016) revealed that mobile phone dependency

increases middle school students' attention and depression problems, and thus negatively affects their relationships with their friends and teachers. Lee et al. (2014) found that users who compulsively use mobile phones (repetitively check their mobile phones) were more likely to have technostress, the stress related to smartphone use.

Even though some researches indicated that smartphone use can increase physical activity (Bort-Roig et al., 2014; Kamboj & Krishna, 2017), mobile phone usage was also negatively related to physical activity. Kim et al. (2015) revealed that those who have high risk smartphone addiction showed less physical activity, average number of walking steps per day. In addition, high-risk smartphone users had lower muscle mass and higher fat mass than those with potential risk or no-risk smartphone addiction (Kim et al., 2015). Lepp et al. (2013) pointed that mobile phone use had potential to interfere leisure time physical activity by promoting sedentary activities (such as playing game); that is, they reported that high frequency mobile phone users were more likely to give up physical activities to use their phones for sedentary activities. Additively, they found that low frequency users – unlike high frequency users – use mobile phones as a motivation for physical activity; that is, mobile phones give these users opportunity to be connected to active peer groups (Lepp et al., 2013).

### 2.3.2. *Sleep Problems*

Mobile phones are becoming bedside media because of being taken to the bedrooms at bedtimes (Exelmans & Van den Bulck, 2016; Lemola et al., 2015). Thus, some researchers have sought to investigate the effects of mobile phone use on sleep.

Exelmans and Bulck (2016) interviewed 844 adults aging 18-94 to explore adults' mobile phone usage at bedtime (sending/receiving messages, and receiving/making calls) and its outcomes on sleep. They revealed that younger adults who frequently use their mobile phones at bedtime have poor sleep quality, and they feel more fatigue and insomnia symptoms (Exelmans & Van den Bulck, 2016). Also, when compared with older adults, young adults tend to wake up later in the mornings if they have bedtime mobile phone use (Exelmans & Van den Bulck, 2016).

Saling and Haire (2016) surveyed 397 adults aging 18-69 to discover the relationship between adults' night-time mobile phone use and tiredness, depression, anxiety, and stress. Researchers reported that 27.7% participants never turned their phones off and 75.6% of participant received text messages after lights out at least one time in a month (Saling & Haire, 2016). Moreover, 17.6% of them felt very tired because of using mobile phone at bedtime whereas 71.5 them were somewhat tired (Saling & Haire, 2016). In addition to these, researchers found that younger adults tended to be more tired, have more stress, anxiety and depression (Saling & Haire, 2016). Lastly, the results showed that adults who wake up by others' mobile phone use tend to have more tiredness, symptoms of stress, anxiety, and depression (Saling & Haire, 2016).

Lemola et al. (2015) surveyed 390 adolescents aged 12-20 years in order to examine the extent of electronic media use of smartphone owners in bed before sleeping, and its effects on their sleep (in terms of sleep duration and sleep difficulties), which can

result in depressive symptoms. They found that adolescents who use smartphones have more electronic media use at bedtime; adolescents communicate by calling or text messaging, or they stay online for chat on social networks (Lemola et al., 2015). In addition, the results indicate that electronic media use in bed before sleeping shortens the sleep duration and causes more sleep difficulties (Lemola et al., 2015). Also, adolescents who use smartphone when lying in the bed tend to experience high levels of depressive symptoms (Lemola et al., 2015).

Nathan and Zeither (2013) surveyed 202 adolescents in California aged 14-19 to examine the relationship between night-time mobile phone use and daytime sleepiness. They found that adolescents who felt the need of being accessible by mobile phone were prone to daytime sleepiness more than others (Nathan & Zeitzer, 2013).

Thomé, Härenstam and Hagberg (2011) studied 4156 young adults aged 20-24 in Sweden to explore the associations between mobile phone use and stress, sleep disturbances, and depression. Researchers revealed that young adults experience stress, sleep disturbances, and symptoms of depression if they wake up at night by the mobile phone, they experience high accessibility stress, and they use mobile phone too much (Thomé et al., 2011).

### *2.3.3. Academic Performance*

Several studies have found that there is a direct negative relationship between mobile phone use of college students and their academic performance from a variety of bases. Samaha and Hawi (2016) identified that the overall GPA of university students with a high risk of smartphone addiction is low. Lepp, Barkley and Karpinski (2014) examine the relationship between college students' cell phone use (including texting) and academic performance. In their study, it is reported that cell phone use negatively related to the GPA (Lepp et al., 2014). That is, students with high frequency cell phone usage tend to have lower GPA (Lepp et al., 2014). Moreover, they also surveyed U.S. college students to investigate the relationship between students' academic performance and mobile phone use with the control of known predictors of academic performance; class standing, cigarette smoking, and gender (Lepp et al., 2015). The result of the study is consisted with their previous work, they reported that high frequency cell phone users have lower GPA (Lepp et al., 2015). In a study with university students from all levels in Tanzania, it is reported that smartphone usage negatively affects students' academic performance (Kibona & Mgaya, 2015). Moreover, from the interviews of students, it is pointed that smartphone use causes distraction while studying and so leads students decrease their GPA (Kibona & Mgaya, 2015). In another study, frequency of cell phone use based on sending and receiving text messages was negatively correlated with academic performance; that is, university students who send/receive higher number of text messages can spend less time on academic works which may result in low GPA (Harman & Sato, 2011). Finally, in the study of Wentworth and Middleton (2014), university students - who use cell phones more than two hours in a week, send at least 30 text messages in a day and have an

average of 5 hours of computer usage per day - accepted as participants frequently using technology, and a strong negative relationship identified between their technology use and academic performance in terms of GPA and SAT scores. Additively, it is found that students who spend too much time on using computer tend to spent less time on studying and so have lower GPAs (Wentworth & Middleton, 2014).

Also, some researchers found that students' academic performance was indirectly associated negatively with the use of mobile phones. In the research of Seo, Park, Kim and Park (2016), it was revealed that mobile phone dependency of middle school students not directly influence students' academic achievement in mathematics and language arts. Instead, mobile phone dependency raises attention and depression problems, which also influence students' emotional states, which may decrease students' academic performance (Seo et al., 2016).

In addition to these, college students increasingly engage in multitasking; they frequently use ICTs (sending texts, talking on cell phone, using Facebook, sending/receiving e-mail, and online searching for information) which are not related to their school works while they are doing school works (Junco & Cotten, 2012). Also, Junco & Cotton (2012) found that Facebook use and texting while making school works negatively affect students' GPAs. However, Lee (2015) discovered that smartphone multitasking did not negatively affect college students' GPA even if students' multitasking behaviour was significantly correlated with their Facebook usage. Furthermore, research investigating the effects of mobile phone multitasking on academic performance is limited. Chen and Yan (2016). reviewed the existing literature on mobile phone multitasking and examined 132 published researches between the years, 1999-2014. They presented the researches which are related to mobile phone multitasking and its negative effect on learning in three main groups named as distraction sources, distraction targets, and distraction subjects (Chen & Yan, 2016). In distraction sources group, researchers examined 12 studies investigating the effect of mobile phone ring (5 studies), texting with mobile phone (4 studies), Facebook use (2 studies) and iPhone use (1 study) as multitasking activity (Chen & Yan, 2016). To be distraction target researches, 2 studies reporting the effect of instant messaging on reading, and one study on cell phone multitasking which distracts students' attention were explained (Chen & Yan, 2016). Additively, in distraction subjects part, researches presented the related studies considering personality, gender and culture issues (Chen & Yan, 2016). As inferred from the review of Chen and Yan (2014), the existing literate is lack of researches examining the effects of mobile phone multitasking on academic performance. That is, recent researches were just about the calling, texting/messaging, social networking features of mobile phones and their impacts on learning.

**Table 1: Researches revealing that there is a direct negative association between Mobile Phone Use and Academic Performance**

<b>Title</b>	<b>Sample</b>	<b>Scale(s) used in Questionnaire</b>	<b>Authors</b>
Relationship among smartphone addiction, stress, academic performance, and satisfaction with life	University students	<ul style="list-style-type: none"> <li>▪ Smartphone Addiction Scale: short version</li> <li>▪ Perceived Stress Scale</li> <li>▪ Satisfaction with Life Scale</li> </ul>	Samaha & Hawi (2016)
The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students	Undergraduate university students	<ul style="list-style-type: none"> <li>▪ Satisfaction with Life Scale</li> <li>▪ Beck Anxiety Inventory</li> </ul>	Lepp, Barkley & Karpinski (2014)
Too Much Information: Heavy Smartphone and Facebook Utilization by African American Young Adults	University students	<ul style="list-style-type: none"> <li>▪ Smartphone Addiction Scale</li> <li>▪ Facebook Addiction Scale</li> </ul>	Lee (2015)
The Relationship Between Cell Phone Use and Academic Performance in a Sample of U.S. College Students	Undergraduate university students	<ul style="list-style-type: none"> <li>▪ Self-Efficacy for Self-Regulated Learning</li> <li>▪ Self-Efficacy for Academic Achievement</li> </ul>	Lepp, Barkley & Karpinski (2015)
Smartphones' effects on academic performance of higher learning students	University students from all levels	Do not have a scale.	Kibona & Mgaya (2015)
Technology use and academic performance	Undergraduate university students	Do not have a scale.	Wentworth & Middleton (2014)
Cell phone use and grade point average among undergraduate university students.	Undergraduate university students	Do not have a scale.	Harman & Sato (2011)



## **CHAPTER 3**

### **METHODOLOGY**

This chapter presents the methodology that adopted for the research study. At first, it states research questions of the study. Afterwards, to address stated research questions, research design developed for the study is presented with sampling procedure and participants. Then, data collection instruments and data collection procedures are explained in detail, and which statistical methods used to analyse the collected data are presented. Lastly, how study fits into research ethics is explained with the permission documents given by METU Applied Ethics Research Center.

#### **3.1. Research Questions**

The research tries to find the answers to the questions listed below:

1. What are the mobile phone usage patterns of college students?
2. Is there a difference in college students' mobile phone affinity scores regarding to their gender?
3. Is there a relation between college students' mobile phone affinity scores and type of their mobile application use?

#### **3.2. Research Design**

Both casual-comparative and survey research methods are adopted for the study to address the research questions stated above.

Casual-comparative research “attempts to determine the cause, or reason, for existing differences in the behaviour or status of groups or individuals” (Gay et al., 2009, p. 218). To investigate causes of differences between groups (male and female) with respect to mobile phone affinity, casual-comparative research is adopted for the study. By the reasons of having already different groups, it is aimed with the casual-

comparative research method that how dimensions of mobile phone affinity (Connectedness, Productivity, Empowerment, Anxious Attachment, Addiction, Contentious Use) lead differences in the use of mobile phone.

A survey research, which is a type of quantitative design providing numeric description of attitudes/opinions of a population from a sample of that population (Creswell, 2007, p. 13), is adopted for the study to “infer information about a population based on a representative sample drawn from that population” (Gay et al., 2009, p. 176). In addition, the survey is cross-sectional because of having data collection at one point in time (Creswell, 2007, p. 157; Gay et al., 2009, p. 176). To be more precise, the data was collected from each participant only one time in the spring semester of 2016-2017 academic year of METU. Moreover, because of having a large population (that is, undergraduate students of METU) to seek information, it is an internet survey which administrated online. The reason for selecting internet survey is that it is a good option in terms of administration if sample size is fairly large and it is widely distributed geographically (Sue & Ritter, 2007, p. 5). However, according to authors, internet survey has 3 disadvantages; coverage bias for population, reliance on survey software, and not knowing who responded to the survey (Sue & Ritter, 2007, p. 7). To eliminate these disadvantages, the survey link was put into IS100 Student System (See Figure 1) after the survey was created on SurveyMonkey, and the participation e-mail was sent to the METU mail address of students who can log in this system by their METU student IDs and IS100 passwords.

In addition to the survey, as non-self-reported data collected from participants, frequency of logging in IS100 Student System via PC and mobile devices were analysed and recorded.

### *3.2.1. Sampling*

To have the opportunity of making conclusions about population characteristics based on sample statistics (Sue & Ritter, 2007, p. 28), probability sampling was selected for the study. Also, because of having a large target population (undergraduate students of Middle East Technical University) to conduct online survey, sample of this study depends on random selection of participants from a defined sampling frame (which predefined as “a list of the population members” (Sue & Ritter, 2007, p.26)). That is, the survey link put on IS100 Student System and participation link was sent to the METU mail address of students who took IS100 (Introduction to Information Technologies and Applications) course in the spring semester of 2016-2017 academic year. In addition to these, the sampling frame of this study also consists of all clusters (which defined as preexisting groups in a population (Sue & Ritter, 2007, p. 169)) in target population. That is to say, IS100 is a must online course which is given to the both male and female students from all undergraduate faculties of METU. Hence, cluster sampling was used as probability sampling procedure, and participants from within each cluster are randomly selected. Therefore, there are two types of cluster; gender (consisting of male and female participants) and faculty (represents the following faculties of METU; Faculty of Engineering, Faculty of Architecture, Faculty

of Economics and Administrative Sciences, Faculty of Art and Sciences, and Faculty of Education).

### 3.2.2. Participants

The sample of this study consisted of 252 undergraduate students with a mean age of 21.71 (SD=2.17). In addition, table 2 shows the number and frequency of participants in each cluster.

**Table 2: Number and Frequency of Participants in Clusters**

<b>Cluster Types</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Male	104	41.3
Female	148	58.7
<b>Faculties of METU</b>		
Faculty of Architecture	8	3.2
Faculty of Arts and Sciences	53	21.0
Faculty of Economics and Administrative Sciences	45	17.8
Faculty of Education	39	15.5
Faculty of Engineering	107	42.5

### 3.3. Questionnaire Structure

The whole questionnaire used in this research was examined by 8 people before conducting the research. One PhD student who is highly experienced in survey researches examined the structure of questionnaire. Another PhD student who makes researches on mobile phones reviewed the content of questionnaire. Three master students (whose native language is Turkish) looked at whether it is understandable in Turkish or not. Lastly, 3 undergraduate students filled the questionnaire under the control of the researcher. The role of the researcher in this process is helping students to clarify the items if they want, and s/he did not interfere students while they are filling the questionnaire. The aim is to find out and resolve what cannot be understood by the target audience.

In addition to these, although 8 people examined the whole questionnaire, any revision in Mobile Affinity Scale was done. The scale was independently developed by this questionnaire (as detailed in Section 3 below). Hence, the final version of the questionnaire mainly consists of 3 parts orderly named as Demographics, Mobil Phone Use, and Mobile Phone Affinity Scale, and it is appended to Appendix A.

### *3.3.1. Section 1: Demographics*

The Demographics section consists of items collecting following data; birth year, gender, nationality, high school type, the faculty they studied at METU, grade, monthly income, working status, whether they have taken online course before or not, which online courses they took (if any), whether they have taken IS100 course before or not, and whether they use mobile phone or not.

### *3.3.2. Section 2: Mobil Phone Use*

Section 2 is formed by items collecting data about mobile phone use of participants. That is, it includes which brand-model smart phone is used, the operating system that works on mobile phones, duration of mobile phone ownership, average time (in hours) spent daily using mobile phone, whether internet package is used on mobile phone or not, the volume of internet package (if any), frequency of Wi-Fi use from mobile phone, purposes that mobile phone is used (Messaging, Taking Photo, etc.) and frequency of use, the applications used on mobile phones, the contexts in which mobile phone used and frequency of use, frequency of lecture-related usage of mobile phones, and feelings of being away from mobile phones.

### *3.3.3. Section 3: Mobile Phone Affinity Scale (MPAS)*

Mobile Phone Affinity Scale (abbreviated to MPAS) is a multi-scale instrument which assesses mobile phone use in terms of six key factors named as Connectedness, Productivity, Empowerment, Anxious Attachment, Addiction, and Continuous Use (Bock, Lantini, et al., 2016). It uses a 5-point Likert-type response format ranging from 1-not at all true to 5-extremely true (Bock, Lantini, et al., 2016). In addition, MPAS is an expanded, revised and validated version of a scale (in terms of psychometric properties) developed by same researchers in a study done with college students (Bock, Thind, et al., 2016). Table 3 presents the items and key factors of MPAS.

The scale used in this research is the Turkish version of Mobile Phone Affinity Scale. That is, it was turned into Turkish and the six-factor structure of 24 items were confirmed before using in the study (author, in press).

As a result, as shown in Table 4, the translated scale consists of 24 items, and 6 factors each with 4 items. Moreover, as original scale, the scale measures on a 5-point Likert-type (1-Not at all true, 2-A little true, 3-Somewhat true, 4-Very true, 5-Extremely trues) basis. Furthermore, the order of the items in the translated version of the MPAS is set to the same order as in the original version of it before using for the research.

**Table 3: Factors and Items of the Original Version of MPAS**

<b>Factors</b>	<b>Original Items (in English)</b>
<b>Connectedness</b>	My phone helps me keep track of my social life.
	When it comes to my health or social life, my phone is my personal assistant.
	My phone helps me stay close to my friends and family.
	My phone makes it easy to cancel plans with others.
<b>Productivity</b>	My phone helps me to be more organized at work/school.
	I use my phone to connect with my co-workers or other students.
	My phone is necessary for work/school.
	My mobile phone helps me to stay up-to-date with work/school activities.
<b>Empowerment</b>	Having my phone with me makes it easier to leave a risky situation.
	I feel in control when I have my phone with me.
	My phone gives me a sense of security.
	I feel safe when I have my phone with me.
<b>Anxious Attachment</b>	I feel anxious if I don't have my phone with me.
	I feel isolated without my phone.
	I feel dependent on my phone.
	Without my mobile phone I feel out of touch with the world.
<b>Addiction</b>	I find myself occupied on my phone even when I'm with other people.
	I find myself occupied with my phone when I should be doing other things.
	I find myself engaged with my mobile phone for longer period of time than I intended.
	I would get more work done if I spent less time on my phone.
<b>Continuous Use</b>	I read/send text messages when I am at work or in class that are not related to what I am doing.
	I use my phone all day.
	I am never bored if I have my phone with me.
	I rely on my phone 24/7.

**Table 4: Factors and Items of the Translated Version of MPAS**

<b>Factors</b>	<b>Translated Items (in Turkish)</b>
<b>Bağlanabilirlik</b>	Telefonum sosyal hayatımı takip etmeme yardımcı olur.
	Sağlığım ve sosyal hayatım söz konusu olduğunda telefonum kişisel yardımcımdır.
	Telefonum arkadaşlarıma ve aileme yakın olmamı sağlar.
	Telefonum başkalarıyla yaptığım planları iptal etmemi kolaylaştırır.
<b>Üretkenlik</b>	Telefonum işte/okulda daha düzenli olmama yardımcı olur.
	Telefonumu iş arkadaşlarımla ya da diğer öğrencilerle iletişim kurmak için kullanırım.
	Telefonum iş/okul için gereklidir.
	Telefonum iş/okul faaliyetlerinde güncel kalmama yardımcı olur.
<b>Güçlendirme</b>	Telefonumun yanımda bulunması riskli bir durumdan kurtulmamı kolaylaştırır.
	Telefonum yanımdayken her şeyin benim kontrolümün altında olduğunu hissedirim.
	Telefonum bana güven hissi verir.
	Telefonum yanımdayken kendimi güvende hissedirim.
<b>Kaygılı Bağlanma</b>	Telefonum yanımda yoksa kendimi endişeli hissedirim.
	Telefonum olmadan kendimi izole olmuş hissedirim.
	Telefonum olmadan hiçbir şey yapamayacağımı hissedirim.
	Telefonum olmadan kendimi dünyada olup bitenlerden habersiz hissedirim.
<b>Bağımlılık</b>	Başkalarıyla beraberken bile kendimi telefonumla uğraşırken bulurum.
	Başka şeyler yapmam gerekirken kendimi telefonumla uğraşırken bulurum.
	Kendimi telefonumla istediğimden daha fazla vakit geçirirken bulurum.
	Telefonumla daha az vakit geçirirsem daha çok iş yapabilirim.
<b>Sürekli Kullanım</b>	İşteyken veya dersteyken yaptığım işle alakası olmayan mesajlar gönderirim ya da okurum.
	Telefonumu gün boyu kullanırım.
	Telefonum yanımdaysa asla canım sıkılmaz.
	Telefonuma 7 gün 24 saat ihtiyacım var.

### **3.4. Data Collection Procedures**

#### *3.4.1. Survey*

For data collection, the questionnaire was created using SurveyMonkey which is a web based questionnaire delivery tool. After getting the approval from IS100 instructors and METU Applied Ethics Research Center, the questionnaire was opened and its link was put into IS100 Student System (See Figure 1). The students were informed by the questionnaire with an e-mail sent to their METU Mail address over ODTÜClass which is a web site serving as the learning management system for METU. The e-mail briefly gave information about the research/researchers and stated them how they can reach to the link of the questionnaire. Moreover, it is emphasized in the e-mail that the participation to the research was completely voluntary and made no effect on the course grade. In addition to these, participants who make the online questionnaire finished the questionnaire if they gave “No” response to the question, “Are you using a mobile phone?” in Section 1, and they did not saw Section 2 and Section 3 of the questionnaire (See Appendix A) Instead of that, after Section 1, they saw the screen presenting After Research Knowledge Form (attached to Appendix B).

#### *3.4.2. IS100 Student System*

IS100 Student System (See Figure 1) carries on the duties of Introduction to Information Technologies and Applications (IS100) course. All students at METU can register the system, and do the tasks opened to them. That is, students can do the followings using the system; asking question to the course instructor, reading the response mails sent to their questions, downloading/uploading assignment, applying proficiency exam, cancelling their proficiency exam registration, taking IS100 (Midterm, Final, Make-up, or Proficiency) exam, learning their exam section, date, time and place, and learning their exam results.

Students’ logins to the system was checked from the code. That is, when students logged into the system via IS100 Student System page, the code looked for the capabilities of client’s browser, and then it recorded the output of code, `browserCaps.IsMobileDevice` (Microsoft, 2017), which returns true if students logged into the system from a mobile device. Moreover, the type of the students’ browsers and their versions were gotten by using the “Browser” and “Type” properties (Microsoft, 2017).

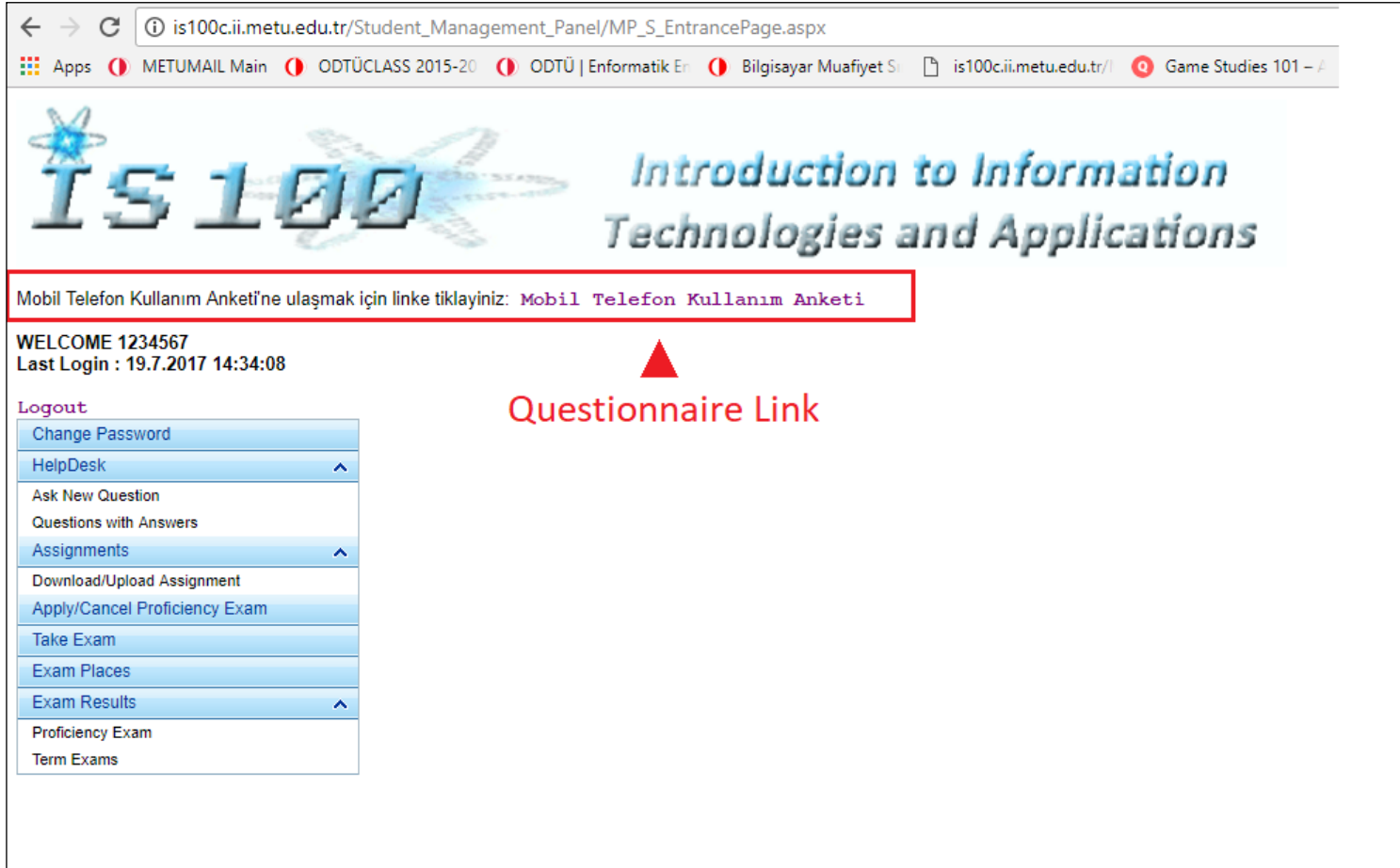


Figure 1: IS100 Student System Screenshot



### **3.5. Data Analysis**

To perform all the statistical analyses explained below, version 24.0 of the IBM Statistical Package for the Social Sciences (SPSS) was used. To do this, the data was exported from SurveyMonkey in an excel file and then it was imported to the SPSS.

#### *3.5.1. Descriptive Statistics*

Descriptive statistics were used to understand the sample that the study conducted. Frequency and percentage statistics were done to examine the distributions of participants' age, gender, nationality, high school type they graduated, faculty they studied at METU, year of study, and working status. In addition, the following mobile phone usage data which are discrete was also analysed with frequency and percentage statistics; types of operating systems that run on participant's mobile phones, mobile phone applications, frequency of Wi-Fi usage from mobile phone, and feeling of participants when they are away from their mobile phones. Measures of central tendency and variability were performed to examine participants' age, duration of mobile phone ownership, daily time spent by using mobile phone, and internet package statistics. Furthermore, mobile phone usage purposes, use of mobile phones in special contexts, and lecture related usage were analysed by using all descriptive statistics.

#### *3.5.2. Independent-Samples T-Test*

Independent-samples *t*-test was performed to investigate how mobile phone usage times (duration of mobile phone ownership & average time spent daily using mobile phone), Wi-Fi usage, mobile phone usage purposes, use of mobile phones in special contexts, and lecture-related usage differ across gender (in terms of Male and Female).

Moreover, in order to address the 2<sup>nd</sup> and 3<sup>rd</sup> research questions, independent-samples *t*-test was also performed. To be more precise, it was investigated by independent-samples *t*-test whether college students' mobile affinity scores changed according to their gender, and type of their mobile application use. Because of having two independent variable groups (male and female, Facebook users and non-Facebook users, WhatsApp users and non-WhatsApp users) to compare their means on each dimensions of the Mobile Phone Affinity Scale (Meyers, Gamst, & Guarino, 2006, p. 283), independent samples *t*-test was preferred in order to analyse the data.

## **1.2. Research Ethics**

The participants of the research were formed by volunteers. Before starting the survey, they read Voluntary Participation Form for Research (attached to Appendix B) which informs them about purpose and content of the research, confidentiality of their data, and contact information about researcher. Moreover, it is written in the form that participants can leave the survey whenever they want. As a result, those who read Voluntary Participation Form for Research and want to make the survey participated in the research. Furthermore, participants also read the post-survey information form called as After Research Knowledge Form (attached to Appendix B). This form briefly states purpose and importance of the research, gives contact information of researchers and METU Applied Ethics Research Center. That is, if they want to learn results of research or to forward their questions/opinions about their participant rights to METU Applied Ethics Research Center, they can contact with responsible people.

In addition to these, data collection was started after getting approval from METU Applied Ethics Research Center for the research. The approval document for research given by ethics committee is appended to Appendix B.

## CHAPTER 4

### RESULTS

The data was analysed by performing the statistical analyses explained in previous chapter, and the findings of the analyses are presented in this chapter. Hence, it consists of three main sections; Subject's Demographics, Mobile Phone Use, and Mobile Phone Affinity Scale Score. Demographics of participants presented in terms of frequency and percentage in Subject's Demographics section. In the second section, the results of descriptive statistics analysing the items forming the Mobile Phone Use part of the Questionnaire (presented in Chapter 3 – Section 3.3.2) were explained. In addition, Independent-samples *t*-test results (indicating how mobile phone usage times, Wi-Fi usage, mobile phone usage purposes, use of mobile phones in special contexts, and lecture-related usage differ across gender) are given in this section. For the third section, named as Mobile Phone Affinity Scale Score, findings of Independent-samples *t*-tests investigating whether college students' mobile phone affinity scores differ regarding to their gender, and type of mobile application used were presented.

#### 4.1. Subject's Demographics

As stated in Chapter 3, cluster sampling was used in the study and participants from within each cluster are randomly selected. Actually, the target population of the sample was undergraduate students of METU from all faculties (Faculty of Engineering, Faculty of Architecture, Faculty of Economics and Administrative Sciences, Faculty of Art and Sciences, and Faculty of Education). Because of having a large population to collect data, a mailing list was used as a sampling frame. That is to say, the participation e-mail sent to the students who take IS100 course (which is a must online course given to all departments stated above) in the spring semester of 2016-2017 academic year. Hence, the sample in the study consisted of 252 undergraduate students (104 male, 148 female) with a mean age of 21.71 (SD=2.17) within an overall range between 19 and 29 years old, and their demographic characteristics are shown in the following table, table 5, in terms of number and frequency.

**Table 5: Demographic Characteristics of the Sample**

<b>Characteristic</b>	<b>n</b>	<b>%</b>
<b>Age</b>		
19	34	13.5
20	55	21.8
21	44	17.5
22	44	17.5
23	26	10.3
24	21	8.3
25	15	6,0
≥ 26	13	5.1
<b>Gender</b>		
Male	104	41.3
Female	148	58.7
<b>Nationality</b>		
T.C.	252	100.0
<b>Year of Study</b>		
Prep Class	35	13.9
1 <sup>st</sup> Class	100	39.7
2 <sup>nd</sup> Class	48	19.0
3 <sup>rd</sup> Class	34	13.5
4 <sup>th</sup> Class	35	13.9
<b>Faculty They Studied at METU</b>		
Faculty of Architecture	8	3.2
Faculty of Arts and Sciences	53	21.0
Faculty of Economics and Administrative Sciences	45	17.8
Faculty of Education	39	15.5
Faculty of Engineering	107	42.5
<b>High School Type</b>		
Anatolian High School	157	62.3
Science High School	28	11.1
Private High School	18	7.1
Vocational High School	6	2.4
Military High School	0	0.0
Other	43	17.1
<b>Working Status</b>		
I am not working	224	88.9
I work part time	26	10.3
I work full time	2	0.8

As you can in the table 5, all participants are citizens of Turkey Republic. The participants with other nationalities were excluded from the sample.

**Table 6: Online Course Availability**

<b>Condition</b>	<b>n</b>	<b>%</b>
Those who have taken IS100 course	147	58.3
Those who have taken Online Courses except IS100	9	3.6
Those who have never taken IS100 and other Online Courses	96	38.1

As shown in the table 6 above, 61.9 % of the students took online courses while 58.3 % of them took only IS100 course as an online course. However, 38.1 % of sample have never taken any online courses.

#### 4.2. Mobile Phone Use

Whether or not participants had mobile phones was checked with an item in the questionnaire. Thus, those who do not use a mobile phone were removed from the sample. Hence, the sample consisted of 252 participants (104 male, 148 female) who have mobile phones that use the following operating systems.

**Table 7: Types of Operating Systems that Run on Participants' Mobile Phones**

<b>Operating System Type</b>	<b>N</b>	<b>%</b>
I do not know	2	.8
IOS	101	40.1
Android	145	57.5
Other	4	1.6
Total	252	100.0

##### 4.2.1. Mobile Phone Usage Times

The mean times that female and male participants have a mobile phone are 7.51 and 7.41 years, respectively. Moreover, the mean times that female and male participants use mobile phone during a day are 5.43 and 3.83 hours, respectively.

**Table 8: Mobile Phone Usage Times**

	<b>Gender</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
<b>Mobile Phone Usage Time (Year)</b>	Female	148	7.51	3.072	.252
	Male	104	7.41	2.974	.292
	Total	252	7.47	3.026	.191
<b>Daily Mobile Phone Usage Time (Hour)</b>	Female	148	5.43	3.745	.308
	Male	104	3.83	3.022	.296
	Total	252	4.77	3.548	.223

**Table 9: Results of Independent-Samples T-Test between Gender and Mobile Phone Usage Times**

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
<b>Mobile Phone Usage Time (Year)</b>									
Equal variances assumed	.049	.826	.240	250	.810	.093	.388	-.671	.857
Equal variances not assumed			.242	226.212	.809	.093	.386	-.667	.853
<b>Daily Mobile Phone Usage Time (Hour)</b>									
Equal variances assumed	9.122	.003	3.605	250	.000	1.599	.443	.725	2.472
Equal variances not assumed			3.741	245.186	.000	1.599	.427	.757	2.440

Results stated on table 9 revealed that mobile phone usage time (in years) not significantly differ between groups,  $t(250)=0.24$ ,  $p>.05$ ; however, males ( $M=3.83$ ,  $SD=0.3$ ) and females ( $M=5.43$ ,  $SD=0.31$ ) differ significantly on daily mobile phone usage time (in hours),  $t(245.19)=3.74$ ,  $p<.05$

#### 4.2.2. Internet and Wi-Fi Usage

242 participants (101 male, 141 female) have an internet package that they use on their mobile phones. Also, 4 female participants of those did not state their internet package volume. Thus, 238 of 252 participants have an internet package with a mean of 3.71 GB. In addition to these, 96% of the participants use Wi-Fi to connect to the internet. Only one person stated that he does not use both internet package and Wi-Fi. Furthermore, independent sample  $t$ -test was applied to investigate how Wi-Fi usage differentiated across gender (results presented at table 31 in Appendix C). As a result, there is no significant difference between males ( $M=4.03$ ,  $SD=0.69$ ) and females ( $M=4.05$ ,  $SD=0.65$ ) on using Wi-Fi ( $t(250) = 0.3$ ,  $p > .05$ ).

**Table 10: Internet Package Statistics**

	N	N				Std.	
	Valid	Missing	Min.	Max.	Mean	Error	Std.
						Mean	Deviation
<b>Package Volume (GB)</b>							
<b>Female</b>	137	11	1	10	3.62	.169	1.975
<b>Male</b>	101	3	1	15	3.82	.248	2.488
<b>Total</b>	238	14	1	15	3.71	.143	2.204

**Table 11: Wi-Fi Usage Statistics**

N Valid	Frequency	Percent
<b>Never</b>	1	.4
<b>Rarely</b>	4	1.6
<b>Sometimes</b>	32	12.7
<b>Often</b>	161	63.9
<b>Always</b>	54	21.4
<b>Total</b>	252	100.0

#### 4.2.3. Mobile Phone Usage Purposes

As you can see in table 12, all participants use mobile phones to set alarm while 251 participants (over 252) connect to the internet via their mobile phones and send/receive messages by using mobile phone applications.

**Table 12: Mobile Phone Usage Purposes**

<b>Purpose</b>	<b>Never</b>		<b>Rarely</b>		<b>Sometimes</b>		<b>Often</b>		<b>Always</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
Voice/video call	16	6.3	37	14.7	83	33.0	85	33.7	31	12.3
Messaging	3	1.2	40	15.9	41	16.3	86	34.1	82	32.5
Messaging via phone application (WhatsApp etc.)	1	.4	2	.8	15	6.0	88	34.9	146	57.9
Voice/video call via phone application (WhatsApp etc.)	43	17.1	74	29.3	75	29.8	36	14.3	24	9.5
Connecting to the internet	1	.4	1	.4	6	2.4	78	31.0	166	65.8
Sending/reading e-mail	6	2.4	22	8.7	64	25.4	91	36.1	69	27.4
Taking photo	2	.8	29	11.5	66	26.2	74	29.4	81	32.1
Taking selfie	22	8.7	69	27.4	54	21.4	56	22.3	51	20.2
Video capturing	8	3.2	87	34.5	78	31.0	41	16.2	38	15.1
Sound recording	47	18.6	100	39.7	71	28.2	19	7.5	15	6.0
Taking notes	16	6.3	63	25.0	80	31.8	62	24.6	31	12.3
Using calendar /Planning	20	7.9	48	19.0	72	28.6	76	30.2	36	14.3
Setting alarm	0	0.0	3	1.2	9	3.6	46	18.2	194	77.0
Listening music	5	2.0	12	4.8	27	10.7	58	23.0	150	59.5
Playing games	77	30.6	63	25.0	47	18.6	34	13.5	31	12.3

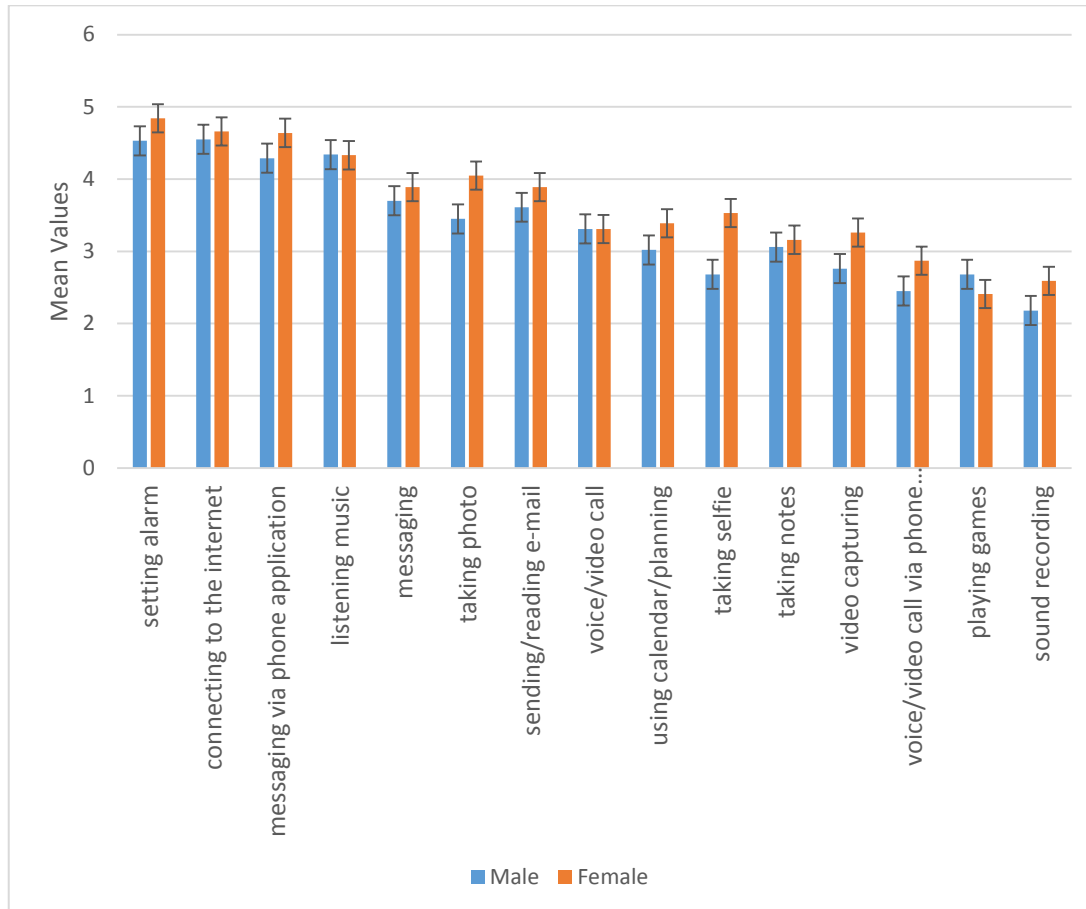


**Table 13: Mean Values of Mobile Phone Usage Purposes**

<b>Purpose</b>	<b>Gender</b>	<b>N</b>	<b>Mean</b>	<b>Total Mean</b>	<b>Std. Deviation</b>
Voice/video call	Female	148	3.31	3.31	1.042
	Male	104	3.31		1.107
Messaging	Female	148	3.89	3.81	1.122
	Male	104	3.70		1.051
Messaging via phone application (WhatsApp, etc.)	Female	148	4.64	4.49	.561
	Male	104	4.29		.784
Voice/video call via phone application (WhatsApp, etc.)	Female	148	2.87	2.70	1.191
	Male	104	2.45		1.148
Connecting to the Internet	Female	148	4.66	4.62	.529
	Male	104	4.55		.681
Sending/reading e-mail	Female	148	3.89	3.77	1.004
	Male	104	3.61		1.028
Taking photo	Female	148	4.05	3.81	.974
	Male	104	3.45		1.032
Taking selfie	Female	148	3.53	3.18	1.209
	Male	104	2.68		1.209
Video capturing	Female	148	3.26	3.06	1.084
	Male	104	2.76		1.093
Sound recording	Female	148	2.59	2.42	.975
	Male	104	2.18		1.139
Taking notes	Female	148	3.16	3.12	1.074
	Male	104	3.06		1.164
Using calendar / Planning	Female	148	3.39	3.24	1.047
	Male	104	3.02		1.262
Setting alarm	Female	148	4.84	4.71	.405
	Male	104	4.53		.750
Listening music	Female	148	4.33	4.33	.992
	Male	104	4.34		.972
Playing games	Female	148	2.41	2.52	1.384
	Male	104	2.68		1.338

Considering the total average values presented at table 13, the order of the usage purposes from most-used to least-used in turn as follows; setting alarm (M=4.71), connecting to the internet (M=4.62), messaging via phone application (M=4.49), listening music (M=4.33), messaging (M=3.81), taking photo (M=3.81), sending/reading e-mail (M=3.77), voice/video call (M=3.31), using calendar or

planning (M=3.24), taking selfie (M=3.18), taking notes (M=3.12), video capturing (M=3.06), voice/video call via phone application (M=2.70), playing games (M=2.52), and sound recording (M=2.42).



**Figure 2: Mean Values of Mobile Phone Usage Purposes for Males and Females**

Independent sample *t*-test investigated how mobile phone usage purposes differentiated across gender (results presented at table 32 attached to Appendix C). There is significant difference between male and female in terms of Messaging via Phone Application ( $t(174.62) = 3.87, p < .05$ ), Voice/Video Call via Phone Application ( $t(250) = 2.79, p < .05$ ), Sending/Reading E-mail ( $t(250) = 2.21, p < .05$ ), Taking Photo ( $t(250) = 4.71, p < .05$ ), Taking Selfie ( $t(250) = 5.46, p < .05$ ), Video Capturing ( $t(250) = 3.62, p < .05$ ), Sound Recording ( $t(250) = 3.08, p < .05$ ), Using Calendar / Planning ( $t(250) = 2.55, p < .05$ ), Setting Alarm ( $t(2145.27) = 3.82, p < .05$ ). Moreover, from the table 13, the mean differences of males and females shows us that female participants use mobile phones more than males for the following purposes at the stated percentages; Messaging via Phone Application (7.8%), Voice/Video Call via Phone Application (15.6%), Sending/Reading E-mail (7.4%), Taking Photo (15.8%), Taking Selfie (26.7%), Video Capturing (16.3%), Sound Recording (16.9%), Using Calendar / Planning (11.4%), Setting Alarm (6.6%).

Furthermore, the use of the purposes may also vary according to the duration of use from person to person. For example; the messaging can take less than 1 hour per day for a person, or it can take hours in a day with short periods of time when compared to another person. Because of having self-reported data from a representative sample of a population, it is hard to differentiate these purposes with regard to duration that their tasks took. Therefore, the findings of this section were presented as reported by the participants.

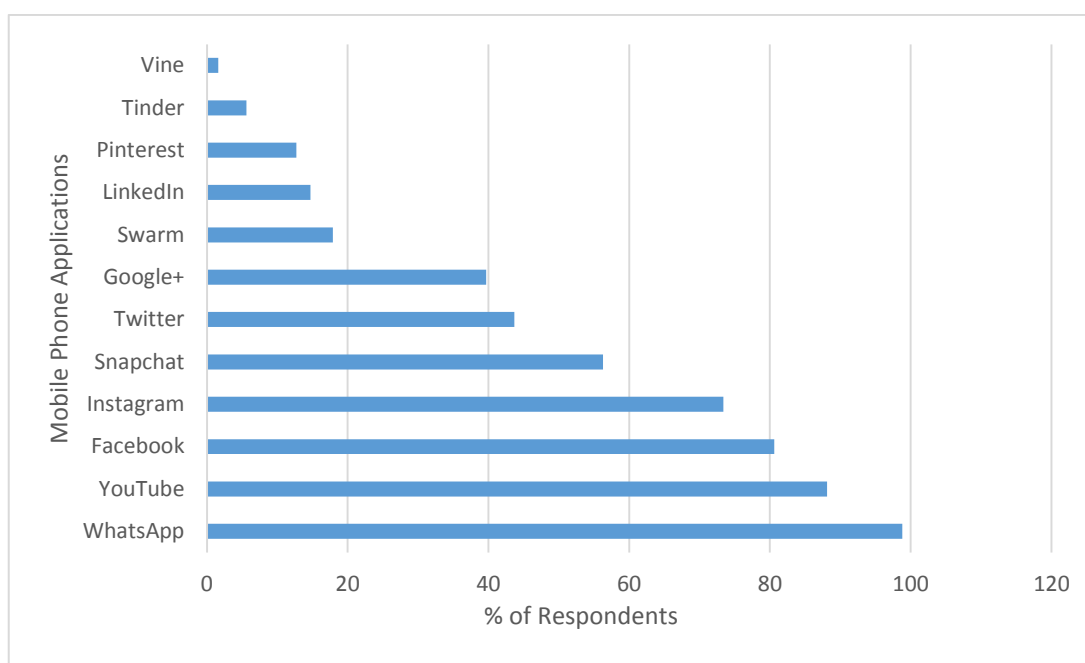
#### 4.2.4. Mobile Phone Applications

WhatsApp is the most used mobile app with a 98.8% user rate. After WhatsApp, YouTube (88.1%), Facebook (80.6%), Instagram (73.4%) and Snapchat (56.3%) are the most popular mobile apps respectively. On the other hand, Vine is the least used mobile app for both males and females with a 1.6% user rate. After Vine, males use Pinterest least (2.8%) while females use Tinder (2%). However, for all participants, Tinder is the second least used mobile app with a 5.6% user rate.

In addition to these, as predicted from the results, Facebook is the most preferred social media platform accessed via mobile phone among university students whereas WhatsApp is the most used messaging app on mobile phones.

**Table 14: Mobile Phone Applications**

Mobile Application	Users				Nonusers			
	N Male	N Female	Total		N Male	N Female	Total	
			N	%			N	%
Facebook	83	120	203	80.6	21	28	49	19.4
Instagram	70	115	185	73.4	34	33	67	26.6
YouTube	95	127	222	88.1	9	21	30	11.9
Pinterest	7	25	32	12.7	97	123	220	87.3
Snapchat	57	85	142	56.3	47	63	110	43.7
Vine	2	2	4	1.6	102	146	248	98.4
WhatsApp	102	147	249	98.8	2	1	3	1.2
Swarm	15	30	45	17.9	89	118	207	82.1
Tinder	9	5	14	5.6	95	143	238	94.4
Google+	33	67	100	39.7	71	81	152	60.3
Twitter	48	62	110	43.7	56	86	142	56.3
LinkedIn	17	20	37	14.7	87	128	215	85.3



**Figure 3: Mobile Phone Application Usage**

#### 4.2.5. Use in Special Contexts

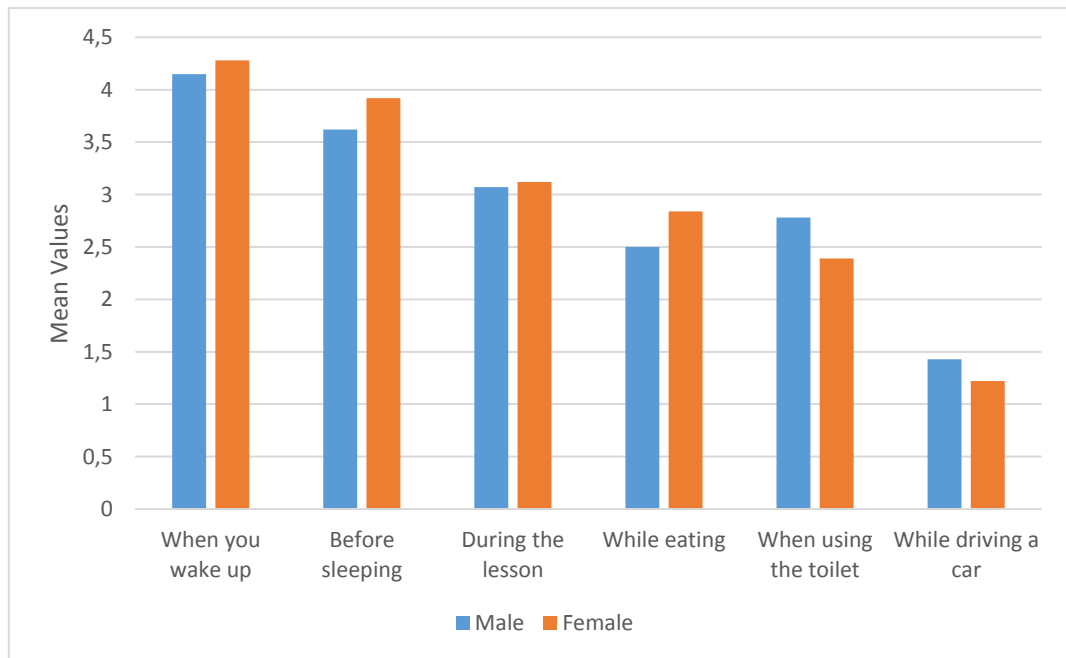
Table 15 states the frequencies of using mobile phones in special contexts in terms of number and percentage, and table 16 indicates the average values of males and females on using their mobile phones in these situations. The context which mobile phones least used is “While Driving a Car” with a mean value 1.33 whereas participants mostly check their mobile phones when they wake up ( $M = 4.22$ ). The second and third contexts which mobile phones mostly used are Before Sleeping ( $M = 3.77$ ) and During the Lesson ( $M = 3.10$ ), respectively.

**Table 15: Frequency of Use in Special Contexts**

Contexts	Never		Rarely		Sometimes		Often		Always	
	N	%	N	%	N	%	N	%	N	%
Before sleeping	19	7.5	26	10.3	28	11.1	94	37.3	85	33.7
When you wake up	2	.8	14	5.6	26	10.3	92	36.5	118	46.8
When using the toilet	78	31.0	61	24.2	44	17.4	34	13.5	35	13.9
While eating	36	14.3	84	33.3	73	29.0	38	15.1	21	8.3
While driving a car	198	78.5	39	15.5	10	4.0	2	.8	3	1.2
During the lesson	9	3.6	51	20.2	116	46.0	58	23.0	18	7.1

**Table 16: Average Values of Use in Special Contexts**

Contexts	Gender	N	Mean	Std. Deviation	Total Mean
Before sleeping	Female	148	3.92	1.110	3.77
	Male	104	3.62	1.360	
When you wake up	Female	148	4.28	.833	4.22
	Male	104	4.15	.993	
When using the toilet	Female	148	2.39	1.403	2.59
	Male	104	2.78	1.386	
While eating	Female	148	2.84	1.076	2.67
	Male	104	2.50	1.207	
While driving a car	Female	148	1.22	.541	1.33
	Male	104	1.43	.856	
During the lesson	Female	148	3.12	.910	3.10
	Male	104	3.07	.948	



**Figure 4: Mean Values of Use in Special Contexts for Males and Females**

According to the results of Independent sample *t*-test (See table 33 at Appendix C) there is a significant difference between males and females on using mobile phone in the following contexts; when using the toilet ( $t(250) = -2.17, p < .05$ ), while eating ( $t(250) = 2.33, p < .05$ ), and while driving a car ( $t(160.13) = -2.28, p < .05$ ). That is, male participants ( $M = 2.78, SD = 1.39$ ) use mobile phones more than females ( $M = 2.39, SD = 1.40$ ) when they are at the toilet. Also, the results (from table 16) indicate that males ( $M = 1.43, SD = 0.86$ ) use mobile phone more than females ( $M = 1.22, SD = 0.54$ ) while driving a car even if 78.5 % participants never use their mobile phone while driving. However, female participants use mobile phone 12.7% more than males while eating.

#### 4.2.6. Lecture-Related Usage Statistics

As indicated in table 16, the average value of using mobile phone during the lesson is 3.10 which show us that there is a 62 % of usage rate. The following tables (Table 17 & Table 18) stated the frequency and mean values of lecture-related usage of mobile phones that are Looking at the Lecture Notes, Looking at Exam Grades, Communication with the Instructor, and Communication with Students.

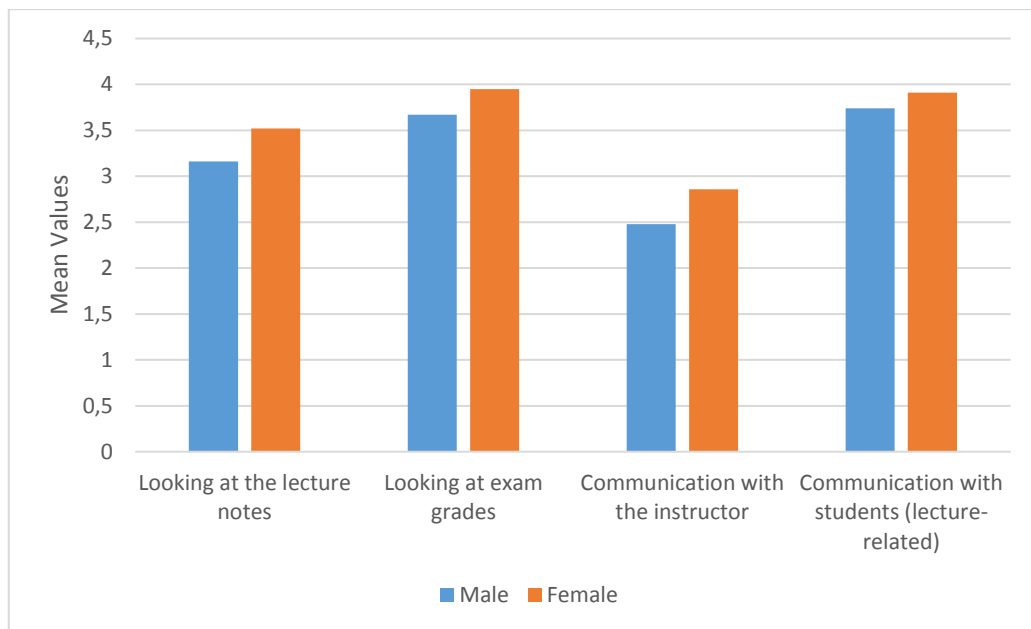
Independent sample *t*-test investigated how lecture-related usage of mobile phones differs across gender (results presented at table 34 in Appendix C). The results shows us that there is significant difference between males and females on looking at the lecture notes ( $t(250) = 2.54, p < .05$ ), looking at exam grades ( $t(250) = 2.14, p < .05$ ), and communicating with the instructor ( $t(250) = 2.42, p < .05$ ). That is, females use mobile phones 10.8% more than males to look at the lecture notes, they check their exam grades 7.3% more than males, and they communicate with their instructors 14.2% more than male participants.

**Table 17: Frequency of Lecture-Related Usage**

	Never		Rarely		Sometimes		Often		Always	
	N	%	N	%	N	%	N	%	N	%
Looking at the lecture notes	17	6.7	37	14.7	70	27.8	91	36.1	37	14.7
Looking at exam grades	8	3.2	15	6.0	58	23.0	101	40.1	70	27.8
Communication with the instructor	51	20.2	65	25.8	65	25.8	50	19.9	21	8.3
Communication with students (lecture-related)	10	4.0	19	7.5	46	18.2	104	41.3	73	29.0

**Table 18: Average Values of Lecture-Related Usage**

Situations	Gender	N	Mean	Std. Deviation	Total Mean
Looking at the lecture notes	Female	148	3.52	1.097	3.34
	Male	104	3.16	1.098	
Looking at exam grades	Female	148	3.95	0.974	3.81
	Male	104	3.67	1.028	
Communication with the instructor	Female	148	2.86	1.240	2.67
	Male	104	2.48	1.190	
Communication with students (lecture-related)	Female	148	3.91	1.084	3.83
	Male	104	3.74	1.005	



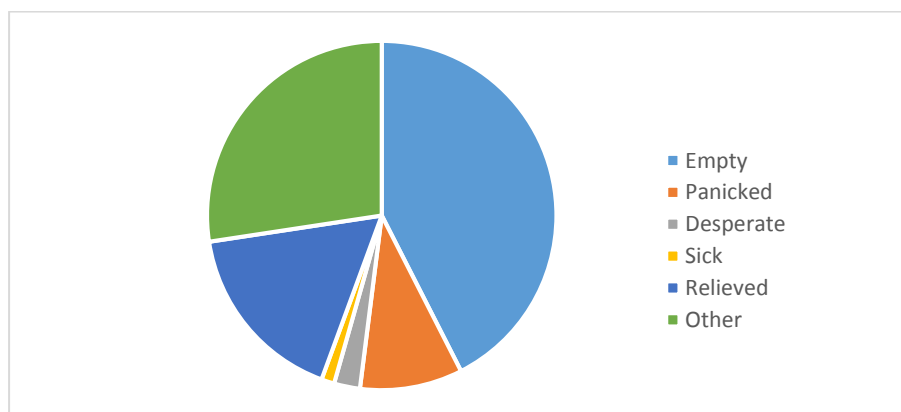
**Figure 5: Mean Values of Lecture-Related Usage for Males and Females**

#### 4.2.7. Feelings of being Away from Mobile Phones

Almost half of the participants feels Empty when they are away from their mobile phones. The second feeling is Relieved with a 17.0 % of usage rate. After Relieved, Panicked comes with a 9.5 % of usage rate. The feelings that are least felt are Sick (1.2 %) and Desperate (2.4 %) respectively. However, 27.4 % of the participants indicate that they feel none of these feelings when they are away from their mobile phones.

**Table 19: Feelings of Participants**

<b>Feelings</b>	<b>Frequency</b>	<b>Percent</b>
<b>Panicked</b>		
Female	14	5.5
Male	10	4.0
Total	24	9.5
<b>Desperate</b>		
Female	2	0.8
Male	4	1.6
Total	6	2.4
<b>Sick</b>		
Female	2	0.8
Male	1	0.4
Total	3	1.2
<b>Empty</b>		
Female	71	28.2
Male	36	14.3
Total	107	42.5
<b>Relieved</b>		
Female	24	9.5
Male	19	7.5
Total	43	17.0
<b>Other</b>		
Female	35	13.9
Male	34	13.5
Total	69	27,4
<b>Total</b>	<b>252</b>	<b>100,0</b>



**Figure 6: Feelings of Participants**



### 4.3. Mobile Phone Affinity Scale Score

Connectedness, Productivity, Empowerment, Anxious Attachment, Addiction, and Continuous Use are the key factors of 24 items of MPAS assessing mobile phone use as presented in table 3. Specifically, these 6 factors refer to the six dimensions of Mobile Phone Affinity Scale. Moreover, to examine whether college students' mobile affinity scores changed according to their gender (male and female) and type of mobile application used, independent-samples *t*-test was conducted. Before conducting *t*-test, the assumption of normality was tested with Kolmogorov-Smirnov test or Shapiro-Wilk test, which compare "the scores in the sample to a normally distributed set of scores with same mean and standard deviation" (Field, 2009, p.144). In addition, the Levene's test which "tests the null hypothesis that the variances in different groups are equal" was used to check the assumption of homogeneity of variance (Field, 2009, p.150).

#### 4.3.1. Mobile Affinity Scale Scores in terms of Gender

Tests of Normality scores were presented on the Table 20. Kolmogorov-Smirnov test is not significant for males on the dimensions, Connectedness and Empowerment,  $p > .05$ , meaning that the sample data was normally distributed for only these groups. Unlike Kolmogorov-Smirnov test, Shapiro-Wilk scores is not significant for males on the Addiction dimension ( $p > .05$ ), and females on the Continuous Use ( $p > .05$ ). In short, both tests indicate that the sample is not normally distributed for some groups. However, these tests make it easy to get significant scores in small deviations from normality if sample size is large (Field, 2009, p.144). Thus, it is assumed that the data of this study is normally distributed to perform independent-samples *t*-test.

**Table 20: Test of Normality for Gender Groups**

	Gender	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<b>Connectedness</b>	Female	.093	148	.003	.980	148	.032
	Male	.081	104	.088	.976	104	.055
<b>Productivity</b>	Female	.141	148	.000	.965	148	.001
	Male	.126	104	.000	.950	104	.001
<b>Empowerment</b>	Female	.089	148	.006	.979	148	.024
	Male	.072	104	.200*	.978	104	.083
<b>Anxious Attachment</b>	Female	.078	148	.029	.980	148	.028
	Male	.099	104	.014	.969	104	.016
<b>Addiction</b>	Female	.101	148	.001	.977	148	.013
	Male	.106	104	.006	.976	104	.056
<b>Continuous Use</b>	Female	.101	148	.001	.982	148	.052
	Male	.112	104	.003	.974	104	.037

**Table 21: Independent Samples Test Scores for Gender**

	Equal variances	Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
<b>Connectedness</b>	assumed	,101	,750	1,202	250	,231	,11590	,09646	-,07407	,30588
	not assumed			1,195	217,437	,233	,11590	,09699	-,07526	,30707
<b>Productivity</b>	assumed	1,457	,229	,364	250	,716	,03119	,08556	-,13732	,19969
	not assumed			,359	209,241	,720	,03119	,08689	-,14010	,20247
<b>Empowerment</b>	assumed	,239	,625	2,415	250	,016	,29983	,12415	,05531	,54435
	not assumed			2,394	214,866	,018	,29983	,12523	,05299	,54667
<b>Anxious Attachment</b>	assumed	,930	,336	2,254	250	,025	,26390	,11706	,03335	,49446
	not assumed			2,292	233,926	,023	,26390	,11515	,03704	,49077
<b>Addiction</b>	assumed	,419	,518	2,455	250	,015	,28775	,11720	,05692	,51857
	not assumed			2,446	218,753	,015	,28775	,11766	,05586	,51963
<b>Continuous Use</b>	assumed	,668	,414	1,951	250	,052	,21563	,11050	-,00199	,43326
	not assumed			1,975	230,987	,049	,21563	,10916	,00055	,43071

Moreover, the results of Levene's test on Table 21 show that the assumption of homogeneity of variance was met for all groups ( $p > .05$ ) indicating that variances in these groups were roughly equal and assumption was tenable. Therefore, females significantly differ from males on three dimensions; Empowerment ( $t(250) = 2.42, p < .05$ ), Anxious Attachment ( $t(250) = 2.25, p < .05$ ), and Addiction ( $t(250) = 2.46, p < .05$ ). That is, female participants ( $M = 3.26, SD = 0.91$ ) has more addictive usage of mobile phones than male participants ( $M = 2.96, SD = 0.93$ ). Also, females ( $M = 2.80, SD = 0.95$ ) feel more anxious attachment to their mobile phones when compared with males ( $M = 2.54, SD = 0.86$ ). Lastly, mobile phone usage gives more empowerment to the females ( $M = 3.21, SD = 0.95$ ) than males ( $M = 2.91, SD = 1.00$ ).

**Table 22: Estimated Marginal Means**

Dependent Variable	Gender	Mean	Std. Error	Std. Deviation	95% Confidence Interval	
					Lower Bound	Upper Bound
Connectedness	Female	3.510	.062	.74395	3.388	3.632
	Male	3.394	.074	.76775	3.249	3.540
Productivity	Female	3.858	.055	.64363	3.750	3.966
	Male	3.827	.066	.70287	3.698	3.956
Empowerment	Female	3.206	.080	.95017	3.049	3.363
	Male	2.906	.095	.99829	2.719	3.094
Anxious Attachment	Female	2.802	.075	.94907	2.654	2.950
	Male	2.538	.090	.86376	2.362	2.715
Addiction	Female	3.252	.075	.90750	3.103	3.400
	Male	2.964	.090	.92787	2.787	3.141
Continuous Use	Female	2.939	.071	.88766	2.799	3.079
	Male	2.724	.085	.82800	2.557	2.890

#### 4.3.2. Mobile Phone Affinity Scale Scores in terms of Social Media Application Usage

The results of this study revealed that Facebook is the most preferred mobile social application between college students in Turkey (presented at chapter 4, section 2.4). Moreover, 2016 mobile phone usage statistics of Turkey showed that Facebook is the most used social media platform on mobile phones in Turkey (Kemp, 2016). Therefore, to examine whether there is a relation between college students' mobile phone affinity scores and their social media app usage or not, Facebook app usage was accepted as social media usage.

An independent sample *t*-test was conducted between Facebook App Usage and each dimension of MPAS called as Connectedness, Productivity, Empowerment, Anxious Attachment, Addiction, and Continuous Use. The independent variables consist of Facebook app users and non-Facebook app users.

Table 23 presents the results of normality tests, Kolmogorov-Smirnov and Shapiro-Wilk. According to scores of both tests, the distribution of the sample for almost all groups is significantly different from a normal distribution,  $p < .05$ . However, the sample size is large which is a limitation for these tests that significant scores can be easily gotten from small deviations from normality (Field, 2009, p.144). Thus, it is assumed that the data of this study is normally distributed to conduct independent-samples *t*-test. Moreover, from the results of Levene's test presented at Table 24, variances for all groups were not significantly different ( $p > .05$ ) and so the assumption of homogeneity was met for all groups.

**Table 23: Tests of Normality for Social Media Application Usage**

	Facebook Usage	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<b>Connectedness</b>	No	.127	49	.047	.977	49	.433
	Yes	.093	203	.000	.979	203	.005
<b>Productivity</b>	No	.130	49	.039	.954	49	.055
	Yes	.088	203	.001	.971	203	.000
<b>Empowerment</b>	No	.172	49	.001	.961	49	.101
	Yes	.080	203	.003	.980	203	.006
<b>Anxious Attachment</b>	No	.154	49	.005	.933	49	.008
	Yes	.075	203	.008	.981	203	.006
<b>Addiction</b>	No	.111	49	.174	.969	49	.223
	Yes	.097	203	.000	.981	203	.008
<b>Continuous Use</b>	No	.130	49	.038	.968	49	.197
	Yes	.104	203	.000	.981	203	.007

**Table 24: Independent Samples Test Scores for Social Media Application Usage**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
<b>Connectedness</b>	Equal variances assumed	.025	.875	-2.157	250	.032	-.25721	.11923	-.49204	-.02239
	not assumed			-2.092	70.449	.040	-.25721	.12296	-.50241	-.01201
<b>Productivity</b>	assumed	.017	.897	-.635	250	.526	-.06756	.10637	-.27706	.14194
	not assumed			-.616	70.531	.540	-.06756	.10958	-.28609	.15097
<b>Empowerment</b>	assumed	.604	.438	-1.636	250	.103	-.25422	.15540	-.56028	.05184
	not assumed			-1.556	68.985	.124	-.25422	.16343	-.58025	.07181
<b>Anxious Attachment</b>	assumed	.875	.351	-2.436	250	.016	-.35415	.14538	-.64047	-.06783
	not assumed			-2.569	78.008	.012	-.35415	.13783	-.62856	-.07975
<b>Addiction</b>	assumed	2.760	.098	-2.658	250	.008	-.38670	.14549	-.67325	-.10015
	not assumed			-2.434	66.440	.018	-.38670	.15885	-.70382	-.06958
<b>Continuous Use</b>	assumed	.389	.533	-1.825	250	.069	-.25106	.13758	-.52203	.01991
	not assumed			-1.847	74.018	.069	-.25106	.13594	-.52191	.01980

It is found with the results of Independent sample *t*-test that Facebook app users differs from nonusers in terms of three dimensions of Mobile Phone Affinity Scale: Connectedness ( $t(250) = -2.16, p < .05$ ), Anxious Attachment ( $t(250) = -2.44, p < .05$ ), and Addiction ( $t(250) = -2.66, p < .05$ ). In addition to these, considering the mean values presented at table 25, it is revealed that those who use Facebook App on their mobile phones reported significantly more mobile phone usage in terms of Connectedness, Anxious Attachment, and Addiction.

**Table 25: Average Values of Facebook App Usage**

	Facebook Application Usage					
	Yes			No		
	N	Mean	Std. Deviation	N	Mean	Std. Deviation
<b>Connectedness</b>	203	3.5123	.74160	49	3.2551	.77977
<b>Productivity</b>	203	3.8584	.66187	49	3.7908	.69475
<b>Empowerment</b>	203	3.1318	.96000	49	2.8776	1.04224
<b>Anxious Attachment</b>	203	2.7623	.92769	49	2.4082	.85039
<b>Addiction</b>	203	3.2081	.88621	49	2.8214	1.02317
<b>Continuous Use</b>	203	2.8990	.86761	49	2.6480	.85073

#### 4.3.3. Mobile Phone Affinity Scale Scores in terms of Messaging Application Usage

According to the results of this study, WhatsApp is the most used messaging application among college students. This result is consistent with the 2016 mobile phone usage statistics of Turkey reported at Digital in 2016 report of We Are Social (Kemp, 2016). As a result of this, to investigate whether there is a relation between college students' mobile phone affinity scores and their messaging application usage or not, WhatsApp usage was considered as messaging app usage.

An independent sample *t*-test was conducted between WhatsApp usage and each dimension of MPAS named as Connectedness, Productivity, Empowerment, Anxious Attachment, Addiction, and Continuous Use. Thus, the independent variables consist of WhatsApp users and non-WhatsApp users.

As presented in Table 26, the results of normality tests were not consistent. Kolmogorov-Smirnov did not test the normality assumption for non-WhatsApp users while Shapiro-Wilk was non-significant for these groups. This can be a result of having a non-WhatsApp user groups with 3 participants because Shapiro-Wilk test can make more accurate measurements with small sample sizes. Thus, to perform independent-samples *t*-test to address 3<sup>rd</sup> research question, it is assumed that the sample was normally distributed. In addition, Levene's test results presented at Table 27 revealed that variances in all groups were roughly equal and assumption of homogeneity was tenable; that is,  $p > .05$ .

**Table 26: Tests of Normality for Messaging Application Usage**

	WatsApp Usage	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<b>Connectedness</b>	No	.211	3	.	.991	3	.817
	Yes	.087	249	.000	.983	249	.005
<b>Productivity</b>	No	.337	3	.	.855	3	.253
	Yes	.090	249	.000	.971	249	.000
<b>Empowerment</b>	No	.265	3	.	.953	3	.583
	Yes	.075	249	.002	.981	249	.002
<b>Anxious Attachment</b>	No	.301	3	.	.912	3	.424
	Yes	.084	249	.000	.978	249	.001
<b>Addiction</b>	No	.328	3	.	.871	3	.298
	Yes	.093	249	.000	.980	249	.001
<b>Continuous Use</b>	No	.219	3	.	.987	3	.780
	Yes	.081	249	.000	.983	249	.005

Furthermore, from the table 27 showing results of independent sample *t*-test, it is found that there is no relation between college students' mobile phone affinity scores in terms of all dimensions and their messaging application usage. That is, the results of independent sample *t*-test for each dimension was non-significant,  $p > .05$ .

**Table 27: Independent Samples Test Scores for Messaging Application Usage**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
	Equal variances assumed									
	not assumed									
<b>Connectedness</b>	assumed	3.034	.083	-.105	250	.916	-.04618	.43910	-.91099	.81862
	not assumed			-.053	2.012	.963	-.04618	.87131	-3.77405	3.68168
<b>Productivity</b>	assumed	.629	.428	.186	250	.853	.07229	.38845	-.69277	.83734
	not assumed			.132	2.024	.907	.07229	.54808	-2.25939	2.40396
<b>Empowerment</b>	assumed	1.723	.191	.150	250	.881	.08534	.57007	-1.03741	1.20809
	not assumed			.089	2.017	.937	.08534	.96303	-4.02584	4.19652
<b>Anxious Attachment</b>	assumed	3.041	.082	.264	250	.792	.14157	.53668	-.91542	1.19856
	not assumed			.144	2.014	.899	.14157	.98420	-4.06508	4.34821
<b>Addiction</b>	assumed	.246	.620	-1.351	250	.178	-.72490	.53642	-1.78137	.33157
	not assumed			-1.550	2.064	.257	-.72490	.46766	-2.67823	1.22843
<b>Continuous Use</b>	assumed	.666	.415	-.869	250	.385	-.43876	.50463	-1.43261	.55510
	not assumed			-1.194	2.093	.350	-.43876	.36741	-1.95393	1.07642



#### 4.4. IS100 Student System Mobile/PC Login Statistics

Whether students enter the system with mobile devices or not was checked from the code. After data collection, the results were exported from the system to an excel file. Moreover, the logins from the PC on the exam times (final exam, proficiency exam) eliminated from the list because students have to have the exam on PC at computer laboratories of METU. Hence, 4059 logins from PCs removed from the excel list. Thus, logins from mobile phones consists 43.8% of all entrance while PC forms 56.2%.

In addition to these, the logins to upload/download IS100 assignments (which should be done over PCs) to the system could not be removed from the list. Therefore, students logged in to the system in order to send/read e-mails, see exam places/results, apply/cancel proficiency exam or download/upload assignments.

**Table 28: Mobile/PC Logins of Participants to the IS100 Student System**

<b>Semester</b>	<b>Mobile Devices</b>		<b>PC</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
2016-2017 Spring	3690	43.8	4733	56.2
<b>Total</b>	3690	43.8	4733	56.2



## CHAPTER 5

### DISCUSSION & CONCLUSION

In general, this chapter presents the results obtained with the study explained in this paper, and discusses the findings of this study. First of all, the study is summarized by addressing to the research questions that lead the research. Secondly, the conclusions drawn from the results are presented by referring the relevant literature. Finally, the chapter is finalized by stating limitations of the study and directions for future research.

#### 5.1. Research Questions Addressed

The main goal of this study is to examine the mobile phone usage behaviours of college students, and explore the relationship between their mobile phone usages in terms of their mobile phone affinity. In detail, it aims to answer research questions presented at following subsections which discusses the findings in terms of research questions covered in the study.

##### 5.1.1. *Research Question 1: What are the mobile phone usage patterns of college students?*

Descriptive statistics (frequency and percentage statistics, mean calculation) were used to understand the sample that the study conducted. Independent-samples *t*-test was performed to investigate how mobile phone usage behaviours differ across gender (male and female). Thus, as a result of these statistics followings are found:

- Females use mobile phone in hours per day significantly more than males.
- Females send message via mobile phone applications 7.8% more than males, they make voice/video call with mobile apps 15.6% more than males, they send/read e-mails 7.4% more than males, they take photo 15.8% than males, they take selfie 26.7% than males, they record videos 16.3% than males, they record sound 16.9% than males, they use calendar or make planning 11.4% than males, and they set alarm 6.6% than males.

- Males use mobile phones 15.1% more than females when they are at the toilet, and also they use mobile phone 15.8% more than females while driving a car. On the other hand, females use mobile phones 12.7% more than males while eating.
- Even though all participants use mobile phones to communicate with other students about the course, females use them significantly more than males for the following lecture-related purposes at the stated percentages; looking at the lecture notes (10.8%), looking at exam grades (7.3%), and communicating with their instructors (14.2%).

*5.1.2 Research Question 2: Is there a difference in college students' mobile phone affinity scores regarding to their gender?*

Independent sample *t*-test was applied to analyse the data in order to answer this research question. The results indicate that there is a significant difference between males and females on mobile phone usage in terms of Addiction, Anxious Attachment, and Empowerment whereas there is no difference between them with respect to the dimensions Connectedness, Continuous Use, and Productivity. Furthermore, they reveal that females use mobile phones more than males on these three dimensions; Addiction, Anxious Attachment, and Empowerment.

*5.1.3. Research Question 3: Is there a relation between college students' mobile phone affinity scores and type of their mobile application use?*

Independent sample *t*-test was performed to analyse the data in order to answer 3<sup>rd</sup> research question. Moreover, because of having WhatsApp as the most used messaging app among participants and Facebook as the most preferred social media platform application, WhatsApp usage was used to examine Messaging app usage and Facebook app usage was accepted to investigate social media usage. It is found that there is a significant relation between Facebook app users and non-Facebook app users on using mobile phones in terms of Connectedness, Anxious Attachment, and Addiction. That is, it is revealed that those who use Facebook App on their mobile phones reported significantly more mobile phone usage in terms of Connectedness, Anxious Attachment, and Addiction. However, no relation was found between college students' mobile phone affinity scores in terms of all dimensions and their WhatsApp use as messaging application usage.

## 5.2. Conclusions

Almost all participants reported that they own a smartphone; 57.5% of the participants use a mobile phone running with Android while 40.1% of them have an iPhone running with IOS. When compared the Turkish population, this rate is well above the 2016 statistics of mobile phone ownership. That is, according to the digital in 2016 report of We Are Social, 86% of Turkish population use a mobile phone whereas 56% of them own a smartphone (Kemp, 2016). This result may be caused by the tendency of young adults on accepting smartphones when compared to older adults. (Anderson, 2015; Lopez-Fernandez et al., 2017; Ma, Chan, & Chen, 2016).

The results of the research indicated that the order of mobile phone usage purposes from most-used to least-used in turn as follows; setting alarm, connecting to the internet, messaging via phone application, listening music, messaging, taking photo, sending/reading e-mail, voice/video call, using calendar or planning, taking selfie, taking notes, video capturing, voice/video call via phone application, playing games, and sound recording. This result is quite different from 2016 mobile phone usage statistics of Turkey which showing that people prefer to use mobile phone most in order to message via mobile messaging apps, watch videos, play games, and use mobile banking and mobile map services (Kemp, 2016). In addition, in line with the research of Fullwood, Quinn, Kaye and Redding (2017) , it can be inferred from this result that smartphones have turned into devices that used for much more than making call and sending text. Moreover, similar to 2016 mobile phone usage statistics of Turkey, it is found that WhatsApp is the most used messaging app among university students whereas Facebook is the most preferred social media platform (Kemp, 2016).

It is revealed with the research that college students mostly check their mobile phones at times when they wake up and before sleeping, showing that mobile phones are becoming bedside media. This is a common result revealed by recent researches. Exelmans and Bulck (2016) found that more than half of the participants brought their mobile phone to their bedroom at bedtimes. Lemola et al. (2015) revealed adolescents who own smartphone has more electronic media use while lying in bed before sleeping than other adolescents. Saling and Haire (2016) reported that 75.6% of adults received text messages after lights out and 50.1% of them were woken by mobile phone use of others at least one time in a month.

Moreover, findings of this research indicate that males use mobile phone significantly more than females while driving a car, which is concurrent with previous studies. Lipovac et al. (2017) reviewed studies published between 1994-2013 about mobile phone use and driving, and researchers reported that younger male drivers are more likely to use mobile phones more often than females and older males while driving. Shi, Xiao and Atchley (2016) surveyed drivers from Beijing and they found that male drivers use mobile phones more frequently than females in order to answer/initiate a call, or read/reply a message. Hallett, Lambert and Regan (2012) surveyed drivers of New Zealand to investigate their frequency of cell phone use while driving in terms of

conversing and sending/reading text messages, and they found that male drivers sent more messages than females while driving a car.

More than half of the students said they were experiencing negative emotional reaction (42.5% Empty, 9.5% Panicked, 2.4% Desperate, and 1.2% Sick) when they are away from their mobile phones. This finding is consistent with prior work on emotional responses to loss/separation from mobile phone, that is, more than two thirds of participants reported negative emotions including lonely, disconnected, anxious, vulnerable, sad, depressed, angry, annoyed, and bored (Hoffner et al., 2015). Also, in line with prior work (Hoffner et al., 2015), only a small number of respondents felt relieved as a positive emotional response in a case of separation from the mobile phone. Moreover, in the study of Sapacz et al. (2016), individuals who compulsively use mobile phones experience anxiety when they cannot access their mobile phones.

Although the average time in years for mobile phone ownership are approximately equal for male and female students, females use mobile phones daily (in hours) significantly more than males. Moreover, the results showed that males and females significantly differ in terms of Empowerment, Anxious Attachment, and Addiction. That is, female students have more addictive usage of mobile phones than males. Also, mobile phone usage gives more empowerment to the females than males. Finally, females show more anxious attachment to their mobile phones according to males. These findings are consistent with recent studies revealing that gender differences affect mobile phone use and females tend to be more affected by the results of mobile phone use. Female adolescents have more electronic media use (calling and text messaging) with their smartphone in bed before sleeping than male adolescents, and they experience higher levels of depressive symptoms than males (Lemola et al., 2015). Female adolescents – when compared with males – feel more comfortable on using online social network sites and sending/receiving text messages, instead of talking face-to-face with others (Seo et al., 2016). Thus, it is found that mobile phone dependency may increase the relationship with friends for females more than for males (Seo et al., 2016). Female adolescents feel more need to be accessible by mobile phone than males. Female and younger adults spent more time with their smartphones and had higher levels of smartphone addiction (Kim et al., 2015; Lee, 2015; Lopez-Fernandez et al., 2017; Pawłowska & Potembska, 2011). Chen et al. (2017) found that female adults have a stronger smartphone addiction than males in terms of perceived enjoyment and pastime; that is, they perceive smartphone use enjoyable and they occupy their free time by using smartphone. Lopez-Fernandez et al. (2017) reported that females were highly dependent on mobile phones and almost all female users used smartphones for leisure activities; they mostly preferred to messaging and chatting, and social networking with Facebook. Pawłowska and Potembska (2011) revealed that females use mobile phone more than males to satisfy their acceptance and closeness needs, and so they experience higher levels of addiction symptoms to text messages and voice calls.

### **5.3. Limitations of the Study**

Although the study provides a small but fresh view on mobile phone usage behaviours of college students, it is not without limitations. The first limitation is related with the sample. Even though participants of the study were selected from one of biggest universities of Turkey, there is a limitation on generalizability of the results to the population which is undergraduate students in Turkey. The second limitation of study is again related with its sample and it should be considered when interpreting the results. That is, in the sample, the number of woman is %6.9 more than man. Thirdly, the study depended exclusively on participants' self-reports. In this case, although self-reports may be an effective method on assessing psychological characteristics and collecting large amounts data from a large number of people for a short time, the accuracy of the data is based on the correctness of the answers given by participants.

### **5.4. Directions for Future Research**

To generalize the results to the population which is undergraduate students in Turkey, the sample of study should be extended with undergraduate students from other universities in Turkey. For the second limitation indicating that the sample consists of %6.9 more female than male (in other words, consisting of unequal group sizes), future research can be done with sample with groups having approximately same number of participants. And lastly, to overcome third limitation, in addition to self-reports collected by survey research, the data about participants' behaviours on mobile phones (e.g., checking habits) can be collected via mobile phones (for example; by using a mobile app running on mobile phones). Even if frequencies of logging in IS100 Student System via PC/mobile were recorded as non-self-reported data in this study, this data is independent from the collected surveys. To illustrate, a student who did a survey may not have entered the system with mobile phone. Thus, this data only shows how many students prefer to use mobile phone in an online course. As another future research for third limitation, a series of short surveys (via Experience Based Sampling) in a limited time interval (for instance; twice a day in a week) can be conducted to the same participants to collect more accurate data from self-reports of participants.

### **5.5. Link of the Research to the Information Systems Field**

Nowadays, mobile phone ownership has surpassed the ownership of commonly used some devices such as desktop/laptop computers, tablets, and MP3 players (Anderson, 2015). Moreover, for some researchers they are the most used devices to access the web (Kemp, 2017); mobile phones provide immediate access to the information, online services, and responsible people whenever and wherever users want. Therefore, mobile phones play an important role in information systems in terms of information access and transfer. In addition to this, the data of this research has helped to see the big picture of people's mobile phone usage behaviors by contributing data to the mobile phone research literature.





## REFERENCES

- Anderson, M. (2015). Technology device ownership: 2015. *Pew Research Reports*, 1–26. Retrieved from <http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/>
- Bock, B. C., Lantini, R., Thind, H., Walaska, K., Fava, J. L., Barnett, N. P., & Scott-Sheldon, L. (2016). The mobile phone affinity scale: Enhancement and refinement. *JMIR Mhealth Uhealth*, 4(4), e134.
- Bock, B. C., Thind, H., Fava, J. L., Walaska, K., Barnett, N. P., Rosen, R., ... Lantini, R. (2016). Development of the mobile phone attachment scale. *Proceedings of the Annual Hawaii International Conference on System Sciences, 2016–March*, 3401–3407.
- Bort-Roig, J., Gilson, N. D., Puig-Ribera, A., Contreras, R. S., & Trost, S. G. (2014). Measuring and influencing physical activity with smartphone technology: A systematic review. *Sports Medicine*, 44(5), 671–686.
- Bowman, N. D., Jöckel, S., & Dogruel, L. (2015). “The app market has been candy crushed”: Observed and rationalized processes for selecting smartphone games. *Entertainment Computing*, 8, 1–9.
- Chen, C., & Leung, L. (2016). Chen, C., & Leung, L. (2016). Are you addicted to Candy Crush Saga? An exploratory study linking psychological factors to mobile social game addiction. *Telematics and Informatics*, 33(4), 1155–1166.
- Chen, C., Zhang, K. Z. K., Gong, X., Zhao, S. J., Lee, M. K. O., & Liang, L. (2017). Examining the effects of motives and gender differences on smartphone addiction. *Computers in Human Behavior*, 75, 891–902.
- Chen, Q., & Yan, Z. (2016). Does multitasking with mobile phones affect learning? A review. *Computers in Human Behavior*, 54, 34–42.
- Creswell, J. W. (2007). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage publications.

- Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2017). Non-social features of smartphone use are most related to depression, anxiety and problematic smartphone use. *Computers in Human Behavior*, *69*, 75–82.
- Exelmans, L., & Van den Bulck, J. (2016). Bedtime mobile phone use and sleep in adults. *Social Science and Medicine*, *148*, 93–101.
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage publications.
- Fullwood, C., Quinn, S., Kaye, L. K., & Redding, C. (2017). My virtual friend: A qualitative analysis of the attitudes and experiences of Smartphone users: Implications for smartphone attachment. *Computers in Human Behavior*, *75*, 347–355.
- Gay, L. R., Mills, G. E., & Airasian, P. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). United States: Pearson Education Ltd.
- Greenwood, S., Perrin, A., & Duggan, M. (2016). Social media update 2016. *Pew Research Center*, (November), 1–18. Retrieved from <http://www.pewinternet.org/2016/11/11/social-media-update-2016/>
- Hallett, C., Lambert, A., & Regan, M. A. (2012). Text messaging amongst New Zealand drivers: Prevalence and risk perception. *Transportation Research Part F: Traffic Psychology and Behaviour*, *15*(3), 261–271.
- Harman, B. A., & Sato, T. (2011). Cell phone use and grade point average among undergraduate university students. *College Student Journal*, *45*, 544–549.
- Hoffner, C. a., Lee, S., & Park, S. J. (2015). “I miss my mobile phone!”: Self-expansion via mobile phone and responses to phone loss. *New Media & Society*, *18*(11), 2452–2468.
- Internet World Stats (2017). Mobile internet – Mobile phones and smart mobile phones. Retrieved July 17, 2017, from <http://www.internetworldstats.com/mobile.htm>
- Jeong, S. H., Kim, H., Yum, J. Y., & Hwang, Y. (2016). What type of content are smartphone users addicted to?: SNS vs. games. *Computers in Human Behavior*, *54*, 10–17.
- Junco, R., & Cotten, S. R. (2012). No A 4 U: The relationship between multitasking and academic performance. *Computers and Education*, *59*(2), 505–514.
- Kamboj, A. K., & Krishna, S. G. (2017). Pokémon GO: An innovative smartphone gaming application with health benefits. *Primary Care Diabetes*, *11*(4), 397–399.

- Kemp, S. (2016). *Digital in 2016*. *www.wearesocial.com*. Retrieved from <https://www.slideshare.net/wearesocialsg/digital-in-2016>
- Kemp, S. (2017). *Digital in 2017: Global overview*. Retrieved from <https://wearesocial.com/special-reports/digital-in-2017-global-overview>
- Key, J. P. (1997). Questionnaire and interview as data-gathering tools. Retrieved from <http://www.okstate.edu/ag/agedcm4h/academic/aged5980a/5980/newpage16.htm>
- 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.
- Kim, S.-E., Kim, J.-W., & Jee, Y.-S. (2015). Relationship between smartphone addiction and physical activity in Chinese international students in Korea. *Journal of Behavioral Addictions*, 4(3), 200–205.
- Lee, E. B. (2015). Too much information: Heavy smartphone and facebook utilization by African American young adults. *Journal of Black Studies*, 46(1), 44–61.
- Lee, Y. K., Chang, C. T., Lin, Y., & Cheng, Z. H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, 31(1), 373–383.
- Lemola, S., Perkinson-Gloor, N., Brand, S., Dewald-Kaufmann, J. F., & Grob, A. (2015). Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. *Journal of Youth and Adolescence*, 44, 405–418.
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2014). The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students. *Computers in Human Behavior*, 31(1), 343–350.
- Lepp, A., Barkley, J. E., & Karpinski, A. C. (2015). The relationship between cell phone use and academic performance in a sample of U.S. college students. *SAGE Open*, 5(1), 1-9.
- Lepp, A., Barkley, J. E., Sanders, G. J., Rebold, M., & Gates, P. (2013). The relationship between cell phone use, physical and sedentary activity, and cardiorespiratory fitness in a sample of U.S. college students. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), 79.
- Lipovac, K., Đerić, M., Tešić, M., Andrić, Z., & Marić, B. (2017). Mobile phone use while driving-literary review. *Transportation Research Part F: Traffic Psychology and Behaviour*, 47, 132–142.

- Lopez-Fernandez, O., Kuss, D. J., Romo, L., Morvan, Y., Kern, L., Graziani, P., ... Billieux, J. (2017). Self-reported dependence on mobile phones in young adults: A European cross-cultural empirical survey. *Journal of Behavioral Addictions*,
- Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied multivariate research : Design and interpretation*. Thousand Oaks, CA: Sage publications.
- Microsoft. (2017). HttpCapabilitiesBase class. Retrieved from [https://msdn.microsoft.com/en-us/library/system.web.configuration.httpcapabilitiesbase\(v=vs.110\).aspx](https://msdn.microsoft.com/en-us/library/system.web.configuration.httpcapabilitiesbase(v=vs.110).aspx)
- Milosevic-Dordevic, J. S., & Žeželj, I. L. (2014). Psychological predictors of addictive social networking sites use: The case of Serbia. *Computers in Human Behavior*, 32, 229–234.
- Mollee, J. S., Middelweerd, A., Kurvers, R. L., & Klein, M. C. A. (2017). What technological features are used in smartphone apps that promote physical activity? A review and content analysis. *Personal and Ubiquitous Computing*, 21(4), 633–643.
- Nathan, N., & Zeitzer, J. (2013). A survey study of the association between mobile phone use and daytime sleepiness in California high school students. *BMC Public Health*, 13(1), 840.
- Oulasvirta, A., Rattenbury, T., Ma, L., & Raita, E. (2012). Habits make smartphone use more pervasive. *Personal and Ubiquitous Computing*, 16(1), 105–114.
- Park, M., & February, C. (2017). Facebook reports fourth quarter and full year 2016 results, (December 2016), 1–12. Retrieved from <https://investor.fb.com/investor-news/press-release-details/2017/Facebook-Reports-Fourth-Quarter-and-Full-Year-2016-Results>
- Pawłowska, Beata Potembska, E. (2011). Gender and severity of symptoms of mobile phone addiction in Polish gymnasium, secondary school and university students. *Current Problems of Psychiatry*, 12(4), 433–438.
- Salicetia, F. (2015). New addictions. *Procedia - Social and Behavioral Sciences*, 191, 1639–1643.
- Saling, L. L., & Haire, M. (2016). Are you awake? Mobile phone use after lights out. *Computers in Human Behavior*, 64, 932–937.
- Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior*, 57, 321–325.

- Sapacz, M., Rockman, G., & Clark, J. (2016). Are we addicted to our cell phones? *Computers in Human Behavior*, 57, 153–159.
- Seo, D. G., Park, Y., Kim, M. K., & Park, J. (2016). Mobile phone dependency and its impacts on adolescents' social and academic behaviors. *Computers in Human Behavior*, 63, 282–292.
- Shi, J., Xiao, Y., & Atchley, P. (2016). Analysis of factors affecting drivers' choice to engage with a mobile phone while driving in Beijing. *Transportation Research Part F: Traffic Psychology and Behaviour*, 37, 1–9.
- Silva, S. R. (2012). On emotion and memories: the consumption of mobile phones as "Affective Technology." *International Review of Social Research*, 2(1), 157–172.
- Smith, A. (2016). 15% of American adults have used online dating sites or mobile dating apps. *Pew Research*. Retrieved from <http://www.pewinternet.org/2016/02/11/15-percent-of-american-adults-have-used-online-dating-sites-or-mobile-dating-apps/>
- Smith, A., & Anderson, M. (2016). Online shopping and e-Commerce. Retrieved from <http://www.pewinternet.org/2016/12/19/online-shopping-and-e-commerce/>
- Smith, A., McGeeney, K., Duggan, M., Rainie, L., & Keeter, S. (2015). U.S. smartphone use in 2015. *Pew Research Center*, 1–60. Retrieved from <http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/>
- Spekman, M. L. C., Konijn, E. A., Roelofsma, P. H. M. P., & Griffiths, M. D. (2013). Gaming addiction, definition and measurement: A large-scale empirical study. *Computers in Human Behavior*, 29(6), 2150–2155.
- Steal Media Ltd (2017). *App store metrics*. Retrieved from <http://www.pocketgamer.biz/metrics/app-store/categories/>
- Sue, V. M., & Ritter, L. A. (2007). *Conducting online surveys*. Thousand Oaks, CA: Sage publications.
- Tan, Ç., Pamuk, M., & Dönder, A. (2013). Loneliness and mobile phone. *Procedia - Social and Behavioral Sciences*, 103, 606–611.
- Thomée, S., Härenstam, A., & Hagberg, M. (2011). Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults - a prospective cohort study. *BMC Public Health*, 11(1), 66.
- Walsh, S. P., White, K. M., Cox, S., & Young, R. M. D. (2011). Keeping in constant touch: The predictors of young Australians' mobile phone involvement. *Computers in Human Behavior*, 27(1), 333–342.

Wentworth, D. K., & Middleton, J. H. (2014). Technology use and academic performance. *Computers and Education*, 78, 306–311.

Wood, E., Zivcakova, L., Gentile, P., Archer, K., De Pasquale, D., & Nosko, A. (2012). Examining the impact of off-task multi-tasking with technology on real-time classroom learning. *Computers and Education*, 58(1), 365–374.

## APPENDICES

### APPENDIX A

#### THE QUESTIONNAIRE

----- (Section 1: Demographics) -----

**Lütfen aşağıdaki alanlara gerekli bilgileri giriniz.**

Doğum Yılıınız (Örnek: 1990) :

Cinsiyet:  Kadın  Erkek  Diğer

Uyruk:  T.C.  Diğer

Mezun Olduğunuz Lise Türü:

Anadolu Lisesi  Meslek Lisesi  Özel Lise  
 Fen Lisesi  Askeri Lise  Diğer

ODTÜ’de Okuduğunuz Fakülte:

Mühendislik Fakültesi  Eğitim Fakültesi  Fen Edebiyat Fakültesi  
 Mimarlık Fakültesi  İktisadi ve İdari Bilimler Fakültesi

Sınıfınız:  Hazırlık  1  2  3  4

Ortalama Aylık Geliriniz (TL):

Çalışma Durumunuz:

Çalışmıyorum  Yarı zamanlı çalışıyorum  Tam gün çalışıyorum

Daha önce çevrimiçi (online) ders aldınız mı?:  Evet  Hayır

Bir önceki soruya cevabınız “Evet” ise bu soruyu cevaplayınız.

Daha önce hangi çevrimiçi ders(leri) aldınız?:

Daha önce IS100 dersini aldınız mı?:  Evet  Hayır

Mobil telefon kullanıyor musunuz?:  Evet  Hayır

----- (Section 2: Mobile Phone Use) -----

Hangi marka-model mobil telefon kullanıyorsunuz?  
(Örneğin; Samsung – Galaxy Note 5):

Mobil telefonunuzda hangi işletim sistemini kullanıyorsunuz? :

- Hangisini kullandığımı bilmiyorum  
 IOS       Android       Diğer

Ne kadar süredir mobil telefon kullanıyorsunuz? (Yıl) :

Gün içerisinde aktif mobil telefon kullanım süreniz (saat) :

Mobil telefonunuzda kullandığınız internet paketiniz var mı?:  Var  Yok

Bir önceki soruya cevabınız “Var” ise bu soruyu cevaplayınız.

İnternet paketinizin büyüklüğü nedir? (GB) :

Mobil telefonunuz ile kablosuz internet erişimi (Wi-Fi) kullanarak ne sıklıkla internete giriyorsunuz?:

- Hiç       Nadiren       Ara sıra       Genellikle       Her zaman

Mobil telefonunuza erişiminiz olmadığında kendinizi nasıl hissedersiniz?:

- Paniklemiş       Hasta       Rahatlamış  
 Umutsuz       Boşluğa Düşmüş       Diğer

Mobil telefonunuzu hangi amaçla ve ne sıklıkla kullanıyorsunuz?

	Hiç	Nadiren	Ara Sıra	Genellikle	Her Zaman
Sesli/görüntülü görüşme					
Mesaj atma					
Telefon uygulaması (Watsapp, Messenger vs.) üzerinden mesaj atma					
Telefon uygulaması (Watsapp, Messenger vs.) üzerinden sesli/görüntülü arama					
İnternete bağlanma					
E-posta gönderme/okuma					
Resim çekme					
Selfie çekme					
Video çekme					
Ses kaydetme					
Not alma					
Takvim kullanma / Planlama yapma					
Alarm kurma					
Müzik dinleme					
Oyun oynama					

Diğer (varsa lütfen belirtin): \_\_\_\_\_



**Mobil telefonunuz ile aşağıdaki sosyal medya hesaplarından hangilerini takip ediyorsunuz?:**

Facebook	<input type="checkbox"/>	Watsapp	<input type="checkbox"/>
Instagram	<input type="checkbox"/>	Swarm	<input type="checkbox"/>
Youtube	<input type="checkbox"/>	Tinder	<input type="checkbox"/>
Pinterest	<input type="checkbox"/>	Google+	<input type="checkbox"/>
Snapchat	<input type="checkbox"/>	Twitter	<input type="checkbox"/>
Vine	<input type="checkbox"/>	Linkedin	<input type="checkbox"/>

**Diğer (varsa lütfen belirtin):** \_\_\_\_\_

**Mobil telefonunuzu aşağıdaki durumlarda ne sıklıkla kontrol ediyorsunuz?**

	Hiç	Nadiren	Ara Sıra	Genellikle	Her Zaman
Yatarken					
Uyandığınızda					
Lavabodayken					
Yemek yerken					
Araba kullanırken					
Ders sırasında					

**Diğer derslerinizdemobil telefonunuzu aşağıdakilerden hangisi için ne sıklıkla kullanıyorsunuz?**

	Hiç	Nadiren	Ara Sıra	Genellikle	Her Zaman
Ders notlarına bakma					
Sınav notlarına bakma					
Öğretim üyesi ile iletişim					
Öğrenciler ile iletişim (derslere ilişkin)					

**Diğer (varsa lütfen belirtin):** \_\_\_\_\_

----- (Section 3: Mobile Phone Affinity Scale) -----

**Lütfen aşağıdaki ifadelerin sizin için ne kadar doğru olduğunu 1-5 ölçeğini kullanarak belirtiniz:**

- 1-Hiç doğru değil
- 2-Çok az doğru
- 3-Bir şekilde doğru
- 4-Çok doğru
- 5-Tamamen doğru

	Hiç doğru değil	Çok az doğru	Bir şekilde doğru	Çok doğru	Tamamen doğru
Telefonum sosyal hayatımı takip etmeme yardımcı olur.					
Telefonumu iş arkadaşlarımla ya da diğer öğrencilerle iletişim kurmak için kullanırım.					
Telefonumla daha az vakit geçirsem daha çok iş yapabilirim.					
Sağlığım ve sosyal hayatım söz konusu olduğunda telefonum kişisel yardımcımdır.					
Başka şeyler yapmam gerekirken kendimi telefonumla uğraşırken bulurum.					
Telefonum yanımdayken kendimi güvende hissedirim.					
Telefonum olmadan hiçbir şey yapamayacağımı hissedirim.					
Telefonum yanımda yoksa kendimi endişeli hissedirim.					
İşteyken veya dersteyken yaptığım işle alakası olmayan mesajlar gönderirim ya da okurum.					
Başkalarıyla beraberken bile kendimi telefonumla uğraşırken bulurum.					
Telefonumun yanımda bulunması riskli bir durumdan kurtulmamı kolaylaştırır.					
Telefonuma 7 gün 24 saat ihtiyacım var.					
Telefonum iş/okul faaliyetlerinde güncel kalmama yardımcı olur.					
Telefonum olmadan kendimi izole olmuş hissedirim.					
Telefonum yanımdayken her şeyin benim kontrolümün altında olduğunu hissedirim.					
Telefonum iş/okul için gereklidir.					
Telefonum olmadan kendimi dünyada olup bitenlerden habersiz hissedirim.					
Telefonum yanımdaysa asla canım sıkılmaz.					
Telefonum arkadaşlarıma ve aileme yakın olmamı sağlar.					
Telefonum başkalarıyla yaptığım planları iptal etmemi kolaylaştırır.					
Telefonumu gün boyu kullanırım.					
Telefonum bana güven hissi verir.					
Telefonum işte/okulda daha düzenli olmama yardımcı olur.					
Kendimi telefonumla istediğimden daha fazla vakit geçirirken bulurum.					

## APPENDIX B

### ETHICS DOCUMENTS

Appendix B presents the ethic documents which were approved by METU Applied Ethics Research Center to collect data from METU undergraduate students.

**Table 29: After Research Knowledge Form (Turkish)**

<p style="text-align: center;"><b>ARAŞTIRMA SONRASI BİLGİLENDİRME FORMU</b></p> <p>Bu araştırma, ODTÜ (Orta Doğu Teknik Üniversitesi) Bilişim Sistemleri Ana Bilim Dalı Yüksek Lisans öğrencisi <i>Hacer Bilü</i> tarafından <i>Prof. Dr. Yasemin Yardımcı Çetin</i> danışmanlığındaki yüksek lisans tezi kapsamında yürütülmektedir. Araştırmanın amacı, üniversite öğrencilerinin çevrimiçi eğitimde mobil telefon kullanımının öngörücülerini belirlemektedir.</p> <p>Mobil telefonlar her an ve her yerde kullanılabilmeleri nedeni ile günlük yaşamımızın bir parçası haline geldi. Üniversite öğrencileri üzerinde yapılan bazı çalışmalar, mobil telefon kullanımının bağımlılık, düşkünlük, nomofobi gibi olumsuz etkileri olduğunu tespit etmişlerdir. Ayrıca önceki araştırmaların sonuçlarına göre, öğrenciler mobil telefonlarını ders saati süresince hem ders içi hem de ders dışı amaçlar için kullanmaktadırlar. Bu araştırma ile ODTÜ lisans öğrencilerinin çevrimiçi bir derste mobil telefon kullanım durumları ve mobil telefon kullanımlarını etkileyen faktörleri tespit etmek amaçlanmaktadır. Çalışmanın sonuçları, mobil telefon kullanımı açısından ODTÜ öğrenci profilinin tanınması ve mobil telefonların derslerde de aktif bir şekilde kullanılarak öğrenciler üzerindeki negatif etkilerinin azaltılması yönünden önem arz etmektedir.</p> <p>Bu çalışmadan alınacak ilk verilerin Ekim 2017 sonunda elde edilmesi amaçlanmaktadır. Elde edilen bilgiler <u>sadece</u> bilimsel araştırma amacı ile kullanılacaktır. Bu araştırmaya katıldığınız için tekrar çok teşekkür ederiz.</p> <p>Araştırmanın sonuçlarını öğrenmek ya da daha fazla bilgi almak için aşağıdaki isimlere başvurabilirsiniz.</p> <p style="text-align: center;">Prof. Dr. Yasemin Yardımcı Çetin (<a href="mailto:yyardim@metu.edu.tr">yyardim@metu.edu.tr</a>) Ar. Gör. Hacer Bilü (<a href="mailto:hbilu@metu.edu.tr">hbilu@metu.edu.tr</a>)</p> <p>Çalışmaya katkıda bulunan bir gönüllü olarak katılımcı haklarınızla ilgili veya etik ilkelerle ilgili soru veya görüşlerinizi ODTÜ Uygulamalı Etik Araştırma Merkezi'ne iletebilirsiniz.</p> <p style="text-align: center;">e-posta: <a href="mailto:ueam@metu.edu.tr">ueam@metu.edu.tr</a></p>
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**Table 30: Voluntary Participation Form for Research (Turkish)**

<p style="text-align: center;"><b>ARAŞTIRMAYA GÖNÜLLÜ KATILIM FORMU</b></p> <p>Bu araştırma, ODTÜ Bilişim Sistemleri Ana Bilim Dalı Yüksek Lisans öğrencisi <i>Hacer Bilü</i> tarafından <i>Prof. Dr. Yasemin Yardımcı Çetin</i> danışmanlığındaki yüksek lisans tezi kapsamında yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.</p> <p><b>Çalışmanın Amacı Nedir?</b></p> <p>Çalışmanın amacı, üniversite öğrencilerinin çevrimiçi eğitimde mobil telefon kullanımının öngörücülerini belirlemektir.</p> <p><b>Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?</b></p> <p>Biraz sonra cevaplayacağınız anket, mobil telefon kullanımına yönelik maddelerden oluşmaktadır. Anket, kişisel rahatsızlık verecek bir öge içermemektedir ve hiçbir ölçek maddesinin doğru ya da yanlış cevabı yoktur. Anket 2 bölümden oluşmakta ve tamamlamanız yaklaşık 10 dakika sürecektir. Ölçek maddelerine vereceğiniz doğru ve samimi cevaplar, çalışmanın güvenilirliği açısından çok önemlidir; lütfen sizi en iyi yansıtan cevapları seçiniz.</p> <p><b>Sizden Topladığımız Bilgileri Nasıl Kullanacağız?</b></p> <p>Bu araştırmaya katılmak gönüllülük esasına dayalıdır. Araştırmaya katılanlardan toplanan veriler tamamen gizli tutulacak, sadece araştırmacılar tarafından değerlendirilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilecek, araştırmanın sonuçları ise bilimsel ve profesyonel yayınlarda veya eğitim amaçlı kullanılabilir; fakat katılımcıların kimliği gizli tutulacaktır.</p> <p><b>Katılımınızla ilgili bilmeniz gerekenler:</b></p> <p>Araştırma kişisel rahatsızlık verecek sorular içermemektedir ve hiçbir ölçek maddesinin doğru ya da yanlış cevabı yoktur. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz.</p> <p><b>Araştırmayla ilgili daha fazla bilgi almak isterseniz:</b></p> <p>Bu araştırmaya katıldığınız için şimdiden teşekkür ederiz. Araştırma hakkında daha fazla bilgi almak için ilgili soru ve yorumlarınızı araştırmacıya <a href="mailto:hbilu@metu.edu.tr">hbilu@metu.edu.tr</a> adresinden iletebilirsiniz.</p> <p><input type="checkbox"/> <i>Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.</i></p>
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05 Mayıs 2017

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu


Sayın Prof. Dr. Yasemin Yardımcı ÇETİN ;

Danışmanlığını yaptığınız yüksek lisans öğrencisi Hacer BİLÜ' nun "*Öğrencilerin çevrimiçi bir derste mobil telefon kullanımları ile mobil telefon ilginlikleri arasındaki ilişkinin keşfedilmesi*" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay 2017-EGT-090 protokol numarası ile 05.05.2017 – 30.09.2017 tarihleri arasında geçerli olmak üzere verilmiştir.

Bilgilerinize saygılarımla sunarım.

  
Prof. Dr. Ş. Halil TURAN

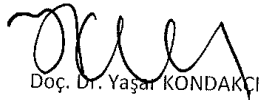
Başkan V

  
Prof. Dr. Ayhan SOL


Üye

  
Prof. Dr. Ayhan Gürbüz DEMİR

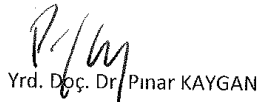
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Doç. Dr. Yaşar KONDAKÇI


Üye

  
Doç. Dr. Zana ÇITAK

Üye

  
Yrd. Doç. Dr. Pınar KAYGAN

Üye

  
Yrd. Doç. Dr. Emre SELÇUK

Üye

**Figure 7: METU Applied Ethics Committee Approval Document for Research**

## APPENDIX C

### INDEPENDENT-SAMPLES T-TEST RESULTS

In this part, the “Independent Samples Test” tables given by SPSS for examining the followings are presented.

- How Wi-Fi usage differentiates across gender in terms of male and female?
- How mobile phone usage purposes differs according to male and female participants?
- How use of mobile phone in special contexts (e.g., Before Sleeping) differs in terms of males and females?
- How lecture-related usage of mobile phones differentiates across gender with respect to male and female groups?

**Table 31: Results of Independent-Samples T-Test between Gender and Wi-Fi Usage**

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Wi-Fi Usage	Equal variances assumed	,001	,978	,296	250	,767
	Equal variances not assumed			,293	212,926	,770

**Table 32: Results of Independent-Samples T-Test between Gender and Mobile Phone Usage Purposes**

Purposes	Equal variances	Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Voice/video call	assumed	.785	.377	.023	250	.982
	not assumed			.023	213.342	.982
Messaging	assumed	.106	.745	1.310	250	.191
	not assumed			1.325	230.471	.187
Messaging via phone application (e.g., Whatsapp)	assumed	8.749	.003	4.091	250	.000
	not assumed			3.866	174.624	.000
Voice/video call via phone application (e.g., Whatsapp)	assumed	.006	.939	2.795	250	.006
	not assumed			2.813	226.820	.005
Connecting to the Internet	assumed	5.089	.025	1.495	250	.136
	not assumed			1.432	185.462	.154
Send/read e-mail	assumed	1.471	.226	2.205	250	.028
	not assumed			2.196	218.604	.029
Taking photo	assumed	3.223	.074	4.712	250	.000
	not assumed			4.665	213.664	.000
Taking selfie	assumed	.131	.718	5.458	250	.000
	not assumed			5.458	221.876	.000
Video capturing	assumed	.024	.876	3.621	250	.000
	not assumed			3.616	220.739	.000
Sound recording	assumed	1.422	.234	3.079	250	.002
	not assumed			2.997	199.365	.003
Taking notes	assumed	.246	.621	.687	250	.493
	not assumed			.677	210.240	.499
Using calendar / Planning	assumed	2.257	.134	2.553	250	.011
	not assumed			2.472	194.893	.014
Set alarm	assumed	56.474	.000	4.216	250	.000
	not assumed			3.828	145.273	.000
Listening music	assumed	.004	.952	-.043	250	.965
	not assumed			-.044	224.753	.965
Playing games	assumed	.205	.651	-1.587	250	.114
	not assumed			-1.596	226.400	.112

**Table 33: Results of Independent-Samples T-Test between Gender and Mobile Phone Use in Special Contexts**

Contexts	Equal variances	Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Before sleeping	assumed	14,607	,000	1,946	250	,053
	not assumed			1,878	192,375	,062
When you wake up	assumed	3,583	,060	1,125	250	,262
	not assumed			1,092	196,476	,276
When using the toilet	assumed	,001	,972	-2,166	250	,031
	not assumed			-2,171	223,491	,031
While eating	assumed	2,341	,127	2,333	250	,020
	not assumed			2,287	205,291	,023
While driving a car	assumed	18,136	,000	-2,456	250	,015
	not assumed			-2,278	160,128	,024
During the lesson	assumed	,302	,583	,458	250	,647
	not assumed			,455	216,165	,649

**Table 34: Results of Independent-Samples T-Test between Gender and Lecture-Related Usage of Mobile Phones**

Usage	Equal variances	Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Looking at the lecture notes	assumed	,021	,886	2,541	250	,012
	not assumed			2,540	221,721	,012
Looking at exam grades	assumed	2,364	,125	2,139	250	,033
	not assumed			2,119	214,243	,035
Communication with the instructor	assumed	,197	,658	2,418	250	,016
	not assumed			2,435	227,338	,016
Communication with students (lecture-related)	assumed	,006	,938	1,226	250	,221
	not assumed			1,242	231,735	,215