Investigation of University Students' Smartphone Usage Levels and Effects

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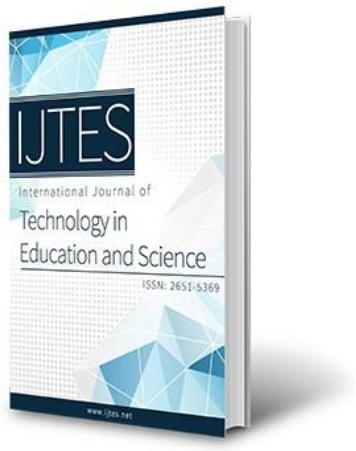

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Feyzi Kaysi
Istanbul University-Cerrahpasa, Turkey

Mehmet Yavuz
Bingol University, Turkey

Emrah Aydemir
Sakarya University, Turkey

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Investigation of University Students' Smartphone Usage Levels and Effects

Feyzi Kaysi, Mehmet Yavuz, Emrah Aydemir

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Abstract

Smartphones are among the most used devices. Considering the high rate of usage by university students, these devices' intended usage is a matter of curiosity. The purpose of this study is to determine the smartphones usage duration and purpose of using for university students. The study was carried out with a qualitative design. In the first stage of the study, smartphones' usage duration were obtained from 29 participants via a smartphone application. Considering these data, in the second stage, data were collected from seven participants via semi-structured interview form. Among the study results, it was determined that smartphones and smartphone applications were used extensively. Although this intensive usage causes on students' physical problems, there is no change in use intensity. According to the results, it was determined that the level of use of smartphones for following the educational processes or for improving learning is in the last place. Besides, problems were identified in students' participation in learning processes and focusing on lessons. The most used application types are messaging, social networks, video watching and editing, and game applications. Among the study's suggestions, reducing students' intensively usage and guiding students for using smartphone applications that support learning processes are stated.

Introduction

The 21st century transforms the world with ever-increasing technological advances that leave a mark in all life areas. The share of the internet and mobile phones in this transformation is quite large. In this context, smartphones, one of the most used technological devices, are becoming widespread day by day. Features such as installing different applications, sending messages, online research tools, playing games, sending e-mails, taking photos and videos, listening radio and music, sending and receiving data, and most importantly, using social network applications are increases the usage rates of smartphones (Aljomaa, Qudah, Albursan, Bakhiet and Abduljabbar, 2016). In addition to these features, it can be stated that today's usage rates have increased with new and more developed smartphone applications.

Smartphones and Operating Systems

Smartphones are defined as multipurpose communication devices that support their users in a wide range of activities such as social networking, browsing, entertainment, and information search by installing various

applications and network connection (Deng et al., 2019; Schrock, 2015). These phones, equipped with wireless connectivity and many applications, are stated to be a portable computing device, changing people's time management and daily practices (Oulasvirta, Rattenburyi, Ma & Raita, 2012). It is also defined as a mobile phone with an operating system (such as Apple iOS, Android, Windows Phone, Symbian OS or Blackberry) that offers an internet connection and allows users to download applications (Taylor & Levin, 2014). These operating systems, which act as an interface between the user and the hardware, differ according to their features. This difference also affects the preferences of devices with operating systems. According to a report by Statista (2020a), smartphones with the Android operating system are the most used mobile operating system, with 74.13% of the market share in December 2020. Its longtime competitor, iOS, has a market share of 24.8%, just behind it. While the total percentage of these two operating systems was around 80% of the market until only five years ago, today, this rate has increased to 99%. In this respect, considering the operating systems, it can be understood that Android and iOS operating systems can dominate the market for many years.

Many mobile applications work with operating systems and record human-computer interactions. These bring many opportunities with their features and affect their preference by users (Miller, 2012). This situation is reflected in the number of downloads of applications to smartphones. According to Statista (2020b) data, while 107 billion (App Store: 30; Google Play: 77) applications were downloaded in 2018, this number increased to 116 billion in 2019 (App Store: 31; Google Play: 85) and 141 billion in 2020 (App Store: 39; Google Play: 102) has been released. In the future, 147 billion downloads are estimated in 2021, 159 billion in 2022, and 171 billion in 2023. In another study, the average number of smartphone applications in 2010 was between 22 and 37, while this number increased to around 60-90 applications in 2018. However, only 20% of these applications were found to be regularly used by the user. Also, users spend 77% of their time with three applications and 99% with ten applications (Blair, 2020; Shin, Hong, & Dey, 2012). The increase in these applications increases the number of people connecting more to the phone and starting applications. In this context, people who start applications more than 60 times a day are called "mobile addicts". Although mobile addicts currently account for only 13% of mobile application users worldwide, this group is overgrowing. The number of mobile addicts has more than doubled in the last year. Again, the largest mobile application users, which make up slightly more than half of the population, are called "normal users" who open an application less than 16 times a day. There has been a modest increase in the number of regular users. People in this third group are called "super users". Superusers make up almost a third of the population, and their numbers have increased by 50% in one year (eMarketer, 2014).

Sales Rates of Smartphones

Phones are used at work, at home, on the street, while eating, in bed, and even in cars. You may even be reading this article on a mobile device right now. Research shows that an ordinary person checks his/her phone every 12 minutes. 10% of people check their phones every four minutes (SWNS, 2017). This increase in usage increases in parallel with the number of smartphones. The distribution of the worldwide smartphone sales figures by year is given in Figure 1.

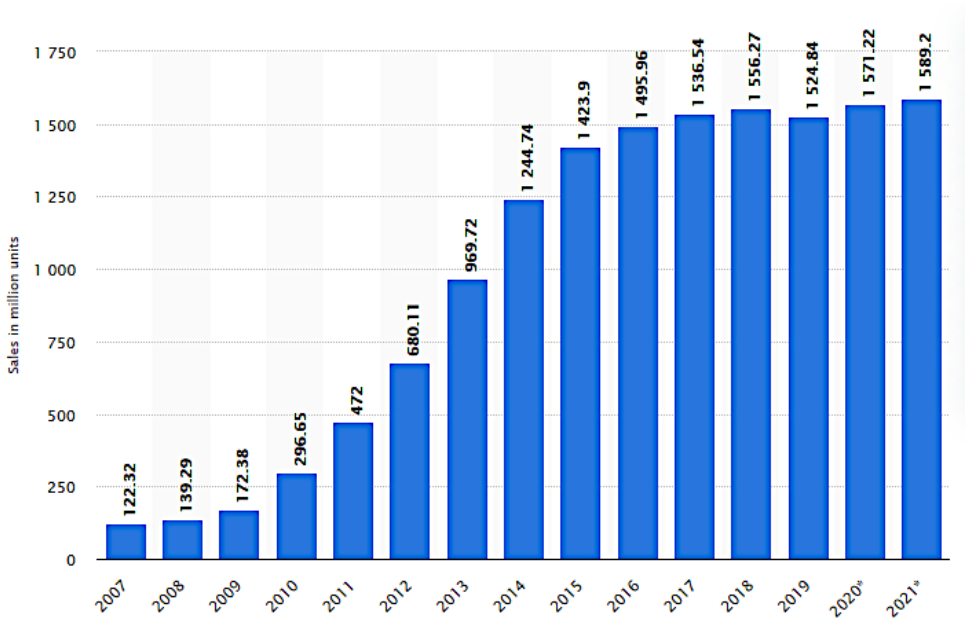

Figure 1. The Number of Smartphones Sales Worldwide between 2007-2021

When Figure 1 is examined, the number of smartphones sales to users worldwide from 2007 to 2021 can be seen. Around 1.52 billion smartphones were sold worldwide in 2019. This figure has decreased by 2% compared to the previous year. The sales numbers, which showed an increasing trend every year, showed a downward direction only in 2019. In 2020, it reached 1.57 billion, with an increase of approximately 1.5%. Finally, the sales forecast for 2021 is expected to increase by 1.1% to 1.58 billion. The increase in sales figures between 2007 and 2020 in the chart is at a record level with approximately 1199% (Statista, 2020b).

Effects of Smartphones: Positive and Negative

Smartphones are used for various purposes. Among these purposes of use, there are reasons such as accessing health information, performing banking transactions, controlling real estate websites, accessing educational content, and surfing the Internet (Smith, 2015). Besides, applications related to personal productivity, social networks, sports, and food in smartphones are preferred (Linnhoff & Smith, 2016). Some negative situations may arise, depending on the use of smartphones. It has been determined that smartphones prevent individuals from engaging in their work, which causes problems, sleep deprivation due to the time spent with smartphones, and spending more time with smartphones (Horwood & Anglim, 2018). In addition to the advantages of smartphones' accessibility, it is pointed out that such devices can lead to excessive dependence and dependence on mobile technology (Roberts, Yaya, and Manolis 2014). The term nomophobia, which refers to excessive smartphone usage, has been used frequently (King et al., 2014; Yildirim and Correia, 2015).

Nomophobia has been defined as a new type of phobia that is a product of the interaction between people and new technologies (King, Valença, & Nardi, 2010). Individuals with homophobic behaviours experience psychosocial, behavioural, and anxiety disorders that affect their lives while away from their mobile devices (Dixit et al., 2010). The increase in the frequency of homophobic behaviour due to excessive smartphone use of

an individual cause adverse effects such as decreased academic performance, lack of motivation in the learning process, antisocial behaviour, changes in cultural values and family relations, decreased social interactions, sleep disorders, stress, anxiety and decreased physical activities (Adnan & Gezgin, 2016; Schweizer, Berchtold, Barrense-Dias, Akre, & Suris, 2017). It has also been stated that excessive mobile phone use is associated with panic disorder (King, Valença, & Nardi, 2010), depression (Alhassan et al., 2018), social anxiety, and loneliness (Gao, Li, Zhu, Liu, & Liu 2016). Many people use their smartphones before bed to check and reply to social media and messages (Deloitte, 2016), which significantly affects the amount and quality of sleep. According to Cooper (2015), in a study of 10,000 people between the ages of 16 and 19 on the significant impact on sleep quality, those who spend more than four hours a day looking at the screen are one and a half times more likely to sleep during the day and sleep under five hours a night than other people. It has been seen to be more. Abo-Jedi (2008) determined that a significant portion of university students are smartphone addicts. Some studies also revealed that women are more dependent on smartphones than men (Billieux, Linden, & Rochat, 2008; Choliz, 2012; Walsh, White, Stephen, & Young, 2011).

Many features of the phones are designed for entertainment and pleasure. For this reason, teachers may think that smartphones can inhibit learning rather than learning support. For example, students who played games for a long time with their electronic devices decreased course material and general performance (Anshari, Almunawar, Shahrill, Wicaksono, & Huda, 2017). Some instructors stated that students suffer from attention deficit in lessons because they carelessly participate in non-academic activities via smartphones (Delello, Reichard, & Mokhtari, 2016). Maya and Nazir (2016) stated that smartphone addiction negatively affects academic performance and leads to the school's negative behaviours (Attamimi, 2011; Walsh, White, Hyde, & Watson, 2011).

Use of Smartphones among University Students

It is known that university students constitute many of those who adopted smartphones first and made them widespread (Lee, 2014; Lepp, Barkley, & Karpinski, 2014). Because university students are prone to using smartphones, they are digital natives, they prefer these devices frequently (Yi, 2016). The use of these devices in daily life can be useful in almost every area of contact. Students who have experience with smartphones tend to use these devices for learning purposes. This trend also increases when they feel useful and easy to use for learning activities (Yi, You, & Bae, 2016). These students use smartphones as learning aids in e-learning and web-based education (Anshari et al., 2017). Again, these devices help to discover exciting ways of learning difficult subjects such as mathematics and science with some functions (Katz, 2012). In this respect, it can be stated that they are useful in concretizing abstract concepts.

University students can access information from the Internet using their smartphones and improve themselves. Therefore, it can be stated that smartphones are useful tools in education (Almunawar, Anshari, Susanto, & Chen, 2015). Smartphones can be helpful in instant messaging, access support, and solving a curious problem. Nowadays, students can easily access information on the Internet, have discussions on social networks, and get quick answers from their peers, lecturers, and even experts. He also stated that many university students use

smartphones to study (Gerlich, Browning, & Westermann, 2010). It has even been said that students can use smartphones to record their lectures, take notes and watch educational videos in the classroom, thereby increasing student success (Reysen, Reysen, & Reysen, 2020). As can be understood from here, smartphones have naturally become a tool frequently used by students in education. It can be stated that these devices have positive effects on students' achievement with their proper use.

The fact that smartphones are mobile and offer different user experiences with more applications every day has increased these devices' usage rate. Considering that these devices are used effectively in many areas, their reflections in education should also be seen. In this way, the use of these devices and the applications in these devices, and their effects on students will be understood. In this context, this study's importance is that the increase in smartphone users' number focuses on its reflections in education. In addition to some research in this field (Boase & Ling, 2013; Böhmer, Hecht, Schöning, Krüger, & Bauer, 2011; Deng et al., 2019; Linnhoff & Smith, 2016; Oulasvirta et al., 2012), it is aimed to contribute to the literature.

In this context, the study aims to determine the periods of less use and examine their effects on students. In this way, the tendencies of the students in higher education towards these devices can be determined. This will be useful in understanding the time spent using a smartphone in general and effect on learning processes. Research questions of the study in line with this purpose:

1. How much time do participants spend daily with their smartphones?
2. What is the average smartphones usage duration of the participants?
3. Which applications do the participants spend the most time with their smartphones?
4. What are the opinions of the participants about their smartphone usage and effecting their learning?

Method

The study was carried out with mixed method. Quantitative and qualitative data collection tools were used in this study. Creswell (2009) defined the mixed method as requiring the use of quantitative and qualitative approaches and the results of the study being more meaningful than both qualitative and quantitative research. From this point of view, the study was planned with the sequential explanatory strategy, which is one of the mixed design approaches. In the sequential explanatory strategy studies, firstly, quantitative data is collected and then qualitative data is aimed to explain the quantitative data (Creswell, 2008).

In the quantitative part of the study, the descriptive survey model was used. The descriptive survey model includes studies aimed at describing a past or present situation fully and carefully (Karasar, 2008). The most widely used descriptive model is the descriptive survey model (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2018). The case study was used in the qualitative part of the study. The case study aims to define and explain an event systematically (Berg & Lune, 2012). The study completed with two stages data. First stage data were collected using a free mobile application that records the participants' smartphone usage duration. After

analyzing the smartphone usage duration obtained in this context, online interviews were conducted with some of these participants for second stage of the study. Semi-structured interview forms used for interviews.

Participants

The study group consists of 34 students at the engineering faculty of a state university in Turkey. The study group was determined using the appropriate sampling method. An informed consent form was prepared for the potential participants who were planned to participate in the study to assess the participants. This form contains detailed information about the study's purpose, duration, the data scheduled to be collected, and how the data will be collected. In addition to consent forms, verbal announcements were made in classrooms, and details about the study were shared with potential participants. Students who wanted to participate in the study voluntarily were informed to communicate with the researchers verbally or by e-mail. After these information, 32 students stated that they would like to participate in the study verbally and two students via e-mail. Totally 34 participant shared smartphone and smartphone applications data. Five of these participants took part in the pilot study.

Data Collection Process and Tools

Data of smartphone usage and participants' view were collected within the scope of the study. It is known that using more than one data collection method in order to increase the quality of the research will be useful (Denzin, 1984). In the study, data were collected with different approaches, and the risk of limitation and bias of the study was minimized, and its validity was maximized (Maxwell, 1996). Within the study's scope, first stage data were collected with the help of a mobile application that determines the smartphone usage duration of the users. Before starting data collection, the five most used mobile applications in the app market that record users' usage duration were determined and tested by the researchers. Each application was used daily, and smartphone usage duration and applications used were monitored. To choose from the applications that have been tried after the researchers' use; different criteria such as working on different phone models and operating systems, giving all usage duration instantly, and sorting according to usage duration were taken into consideration in collecting data.

After the evaluations were complete, the mobile application to be used within the study's scope was determined by a joint decision. Five volunteer students participated in the one-week pilot study carried out with the mobile application decided to be used. Within the pilot study's scope, it was tried to determine the students' smartphone usage duration, the applications they use, and the problems that may arise during use. During the pilot study, it was decided to use the application as the participants did not encounter any issues. 29 participants used this application for two weeks. The two-week data of the participants were conveyed to the researchers.

The second stage data in the study were obtained using the interview method, and these data were used to explain and make sense of the first stage data obtained previously. Interview method, it is expressed as trying to enter the inner world of a person and understand and comprehend events from his perspective (Patton, 1987).

Interviews were conducted online with the participants through a semi-structured interview form. The semi-structured interview form prepared within the scope of this study consists of 11 questions.

The answers given by the students to the interview questions were recorded in a digital environment, and then textual transcripts of these recordings were made. The text and audio files obtained were checked by an expert other than the researchers. Texts confirmed by the expert were sent to the participants, and they were asked to provide feedback if there were parts they wanted to check, add, remove, or correct. Analysis studies were carried out on the texts sent by the participants.

Data Analysis Process

The first stage data obtained within the research scope were analyzed using descriptive statistical tools such as frequency and average. Smartphone usage data of 29 participants were analyzed. The second stage data obtained within the scope of the study were analyzed using the content analysis method. The content analysis aims to reduce the words in a research text to a smaller number of content categories (Creswell, 2013). In other words, the necessary process in content analysis is to gather similar data within the framework of specific concepts and themes and to interpret them in a way that the reader can understand (Yıldırım & Şimşek, 2008). Codes and themes were determined by the joint decision of the authors. Additionally, some of the participants' views were given by directly quoting in related theme.

Results

The findings obtained in this study, which was carried out to determine the duration of smartphone usage of university students, application trends in these devices, and smartphone usage effects were discussed in three dimensions.

Smartphone Usage

When the user data obtained from the participants for two weeks were examined, the applications' weekly and daily usage duration were revealed. These obtained data are presented in Table 1.

Table 1. Participants' Smartphone Usage Durations

Individual Weekly Use	n	Daily Average (Hour: Minutes)	Daily Average (Minutes *)
Less than 1000 minutes	3	01:28	88
Between 1001-2000 min.	7	03:15	195
Between 2001- 3000 min.	12	05:43	343
Between 3001- 4000 min.	5	07:24	444
More than 4000 min.	2	10:11	611
Average		05:17	317

When the data in Table 1 were examined, it was determined that 29 participants used their smartphones for an average of 317 minutes (05:17) a day. While only 10 of these participants were below the average usage duration, 12 of them showed a usage close to the average using with 343 minutes (05:43). However, it was found that five participants used smartphones with an average of 444 minutes (07:24) a day and two participants used an average of 611 minutes (10:11) a day. The data showing the daily usage duration (minutes) of the participants is given in Figure 2.

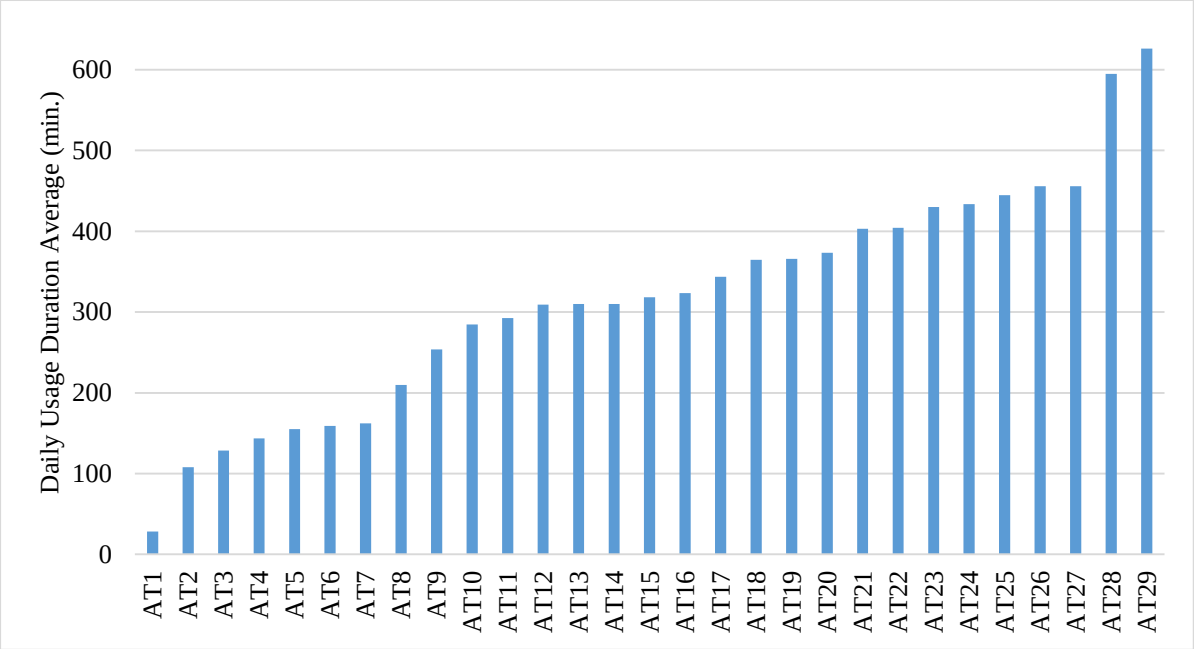

Figure 2. Participants' Daily Smartphone Usage Duration

When the data above is examined, it can be seen that although some participants use smartphones for a short time daily, very high rates of usage duration of some participants can also be seen. The average daily usage duration of the participants was 317 minutes. Considering this period, it is understood that 14 participants were under this period, and 15 participants had a usage above this period.

When these data were compared with the participants' expressions, the statements supporting these data were reached. In these expressions, intensive usage, which occurs especially due to smartphone and smartphone applications, comes to the fore. In line with the participants' expressions, it is understood that smartphones are seen as an essential tool by the participants in the natural flow of daily life. Some of the participant expressions supporting the data obtained in this dimension are presented below as direct quotations.

> *AT1: I use the phone often. I am so used to it, and I cannot break it. When I wake up in the morning, the first thing I think of is the phone. I am looking at the phone immediately. Is there a notification? I check to see if there is any. I always check the phone before I go to sleep at night. Sometimes I text friends for hours. I spend more time because of social media.*
>
> *AT9: I do not use the phone much, but I was shocked to see that I use it 4-5 hours a day in the program I installed on my phone. So I use the phone a lot.*

AT11: Actually, I use neither too much nor too little. I saw that I used that program for 3 hours a day or something. I do not think I use it enough to be dependent because some friends use it more than I.

According to the participants' expressions, it is understood that some participants are aware of the high level of smartphone usage. However, it can be stated that some participants regarded this period of usage as normal despite intensively usage.

Trends of Smartphone Application Between University Students

Among the most attractive smartphones, planning of daily work, entertainment, communication, internet, photography, and music tools stand out. To reveal the smartphone application usage of the participants, the application usage durations were examined. The data resulting from this examination are presented in Table 2.

Table 2. Usage of Smart Phone Applications

Application Category	Type of Applications	Usage Rate (%)	Individual Daily Average (Hour: Minutes)
Messaging Applications	4	25.17	1:20
Social networks	9	21.89	1:10
Watching and Editing Videos	23	21.06	1:07
Game Applications	19	9.60	0:33
Phone Applications	26	8.24	0:26
Internet Browser	6	3.90	0:12
Taking Note/Reading Stories	2	3.83	0:12
Photo Editing	4	1.88	Less than 10 minutes
Listen to music	14	1.49	Less than 5 minutes
Other Applications	8	0.90	Less than 5 minutes
News Applications	11	0.57	Less than 5 minutes
Shopping Apps	8	0.35	Less than 5 minutes
Application Store	4	0.31	Less than 5 minutes
Access and Editing Files	6	0.27	Less than 5 minutes
Operator Applications	6	0.21	Less than 5 minutes
Bank Applications	8	0.14	Less than 5 minutes
Tarot / Fortune Telling	3	0,11	Less than 5 minutes
Educational Applications	5	0.09	Less than 5 minutes
Total	166	100.00	05:17

According to the data in Table 2, it is seen that the participants actively use many applications. Mostly messaging, social networks, video watching and editing, and game applications correspond to approximately 77.72% of the time spent on smartphone applications. In other words, participants mostly use their smartphones for messaging, following or sharing social network accounts, watching videos or editing, and playing games,

mainly football. Among these applications, it has been determined that messaging applications have the highest usage duration. These applications are used individually for an average of one hour and 20 minutes a day. Social network and video applications have been identified among the applications used separately for more than one hour a day. Game applications have emerged as 33 minutes and phone applications with 26 minutes. After comparing smartphone application usage duration and participant expressions, it was revealed from the participants' expressions that messaging and social network applications were used extensively. Although this intensively usage is not deemed appropriate by some participant families, it was stated that the participants continued this intense participation. It was also noted that some participants used game applications for hours. Some participant expressions regarding this dimension are given below as direct quotations.

> *AT1: I get angry with myself sometimes. Because I spent too much time, I'm recording myself on social media. I do not understand how time passes. … Again, I cannot control myself.*
> *AT9: I go to bed by phone in the evening. I love playing games on the phone. I often play games at night. Moreover, I am texting with friends at night on WhatsApp. Sometimes I do not notice the time.*

The expressions of the participants regarding their smartphones and applications are striking. Mainly depending on the usage, the bond's strength that develops between the user and the smartphone over time increases.

Effects of Used Applications on Smartphones

Considering the smartphone usage durations and participants' expressions, it is understood that the students use smartphones and smartphone applications intensively. When the intended usage of smartphones and smartphone applications for the participants is considered, two dimensions emerge. These dimensions can be classified as beneficial use and adverse effects due to over-use. Useful services are stated as taking care of daily tasks, communication, self-development, doing research, doing homework, and studying for exams. These applications help to student for organizing their daily life and improving learning processes. Besides, when the views expressed by the participants due to intensively usage are examined, it is understood that some participants have physical problems. These problems were reported due to tear, burning, redness, or drying in the eyes, inability to be aware of time, head and neck pain, insomnia, or sleep patterns. It was stated that some participants who had sleep problems were negatively affected by being late to the school or having difficulty concentrating on the lessons. These negativities directly affect the learning processes of the participants.

> *AT1:… I text friends for hours. Sometimes tears come from my eyes. I have a hard time waking up in the morning when I text you late. I am late for the first lesson on school days.*
> *AT11:… I take the phone to the toilet and spend time there. I stay a little too long in the toilet. I use a phone under the blanket in cold weather so that my family cannot see it at night so that they cannot see the light.*
> *AT25: Sometimes, we play with friends for hours. When we dive into the game, we forget the clock and sleep late. Sometimes I remember falling asleep in the game.*

Although the participants' statements talk about smartphones' positive functions, the negative results that occur mostly dominate. It is understood that these negativities continuously occur in the participants.

Discussion

This study is important in giving university students' smartphone usage duration and the rates of smartphone applications. It tried to reveal the cause-effect relationship between the data by in-depth analysis and continuous comparison of the study's data. According to the study results, it was revealed that smartphones and the applications installed on these phones are used intensively by university students. These students adapt better to adopt and use smartphones than other age groups (Lee, 2014; Lepp, Barkley, & Karpinski, 2014). Considering this compliance and usage, it was concluded that some participants used smartphones for an average of more than 10 hours per day. The increase in the duration of use of smartphones over time may cause some problems. Some of these problems are physical, and some are psychological. Physical problems may arise in individuals due to smartphones' excessive use (Tamura, Nishida, Tsuji, & Sakakibara, 2017). Although this intensively usage causes different students' physical problems, students do not change their use intensity due to these negativities. Because students may display behaviors such as the desire to constantly control their smartphones and to experience anxiety if they leave the phone (Kocabaş & Korucu, 2018). In this case, it may prevent students from staying away from smartphones or reducing their usage duration. As a result, discomfort such as tears, burning, redness, or dryness of the eyes, head and neck pain, insomnia, or sleep disturbance may occur due to the long screen time. It has been determined that individuals are sleep deprived due to smartphones' excessive use and spend more time with smartphones than necessary. It was also determined that some participants with sleep problems were late for the lessons or had difficulty focusing on the lesson (Horwood & Anglim, 2018).

In line with the participants' expressions, although it was stated that smartphones provide many advantages, especially education, the results obtained do not support these statements. According to the results, it was determined that using smartphones for following the educational processes or improving learning is at the lowest level. There is a decrease in the course material and general performance of students who use a smartphone other than lessons or learning activities (Anshari et al., 2017). Therefore, using a smartphone that does not positively affect learning processes can also cause negativity in learning performance. In other words, excessive smartphone usage causes students to exhibit attention deficit (Delello, Reichard, & Mokhtari, 2016, 2016), decrease in academic performance (Maya & Nazir, 2016), and harmful behaviours at school (Attamimi, 2011; Walsh. , White, Hyde, & Watson, 2011). However, there are cases where university students tend to use their smartphones for learning (Yi, You, & Bae, 2016), their phones are used as a learning aid (Anshari et al., 2017), and they make some subjects that have difficulty learning interesting (Katz, 2012) There are also. In such cases, it can be stated that smartphones are integrated into learning processes.

University students mostly use social and communication applications on their smartphones (Bomhold, 2013). Among the study results, the most used application types include messaging, social networks, video watching and editing, and game applications. Among these, the most preferred social network applications, popularize

smartphones (Aljomaa et al., 2016). Also, smartphones are preferred for internet surfing, entertainment, and information searching (Deng et al., 2019; Schrock, 2015). For the last decade, social networking sites among university students have been rapidly increasing worldwide and have become an essential part of young people (Isha & Sharma, 2018). Studies are carried out to ensure that these practices give positive results in the field of education. With some reviews, it has been revealed that social networks can be used as practical tools in education (Arteaga Sánchez, Cortijo, & Javed, 2014; Cain & Policastri, 2011; Norman, Nordin, Din, Ally, & Dogan, 2015).

Smartphones are undoubtedly used effectively at every stage of life. If this use is not at a controllable level, there is no doubt that individuals will experience problems depending on the service. The participants' expressions in the study, such as "I am used to it, I cannot break off, I lose myself, I am not aware of the time, I cannot think without a phone," are striking. These expressions should be seen as problematic, and therefore, an attempt should be made to resolve them. Failure to pay attention to smartphone usage can lead to over-addiction and addiction to mobile technology (Roberts, Yaya, and Manolis 2014). It will be useful to get expert help in this regard. Otherwise, increasing addiction over time can cause different unpredictable problems. Controlling smartphones should be considered as a situation that needs attention, especially while sleeping, and as soon as you wake up. Most people use their smartphones after bed to check and reply to social networks and messages (Deloitte, 2016). This situation was also detected in the participants in the study. As a result, there have been adverse effects on the amount and quality of sleep.

Conclusion

Students' physical problems as a result of intensive usage of smartphones and smartphone applications directly affect their learning processes. Among these problems, there are especially negativities in students' participation or focusing on lessons. These negativities cause students not to get or have missing learning outcomes expected from the courses. Even if some students are aware of these negativities, their duration does not decrease, or they do not ask for help to reduce it. These students continue to use at the same rate. During their undergraduate education, these negativities related to students' intensive usage may negatively affect their professional competence. As a result, professional competencies of students may not be at the expected level before graduation. For this reason, the need to take precautions is a necessity for these students. Otherwise, there will be losses for qualified learning time. In the precautions to be taken, reducing intensive smartphone usage and then direct students to applications that improve their learning may be included.

Recommendations

Among the study's recommendations, it can be stated that students' intensively usage of smartphones and smartphone applications should be reduced. This intensively usage causes different and many physical problems in students. In addition, students' smartphone and application usage habits should be supported by applications that support their learning process. In this way, the useful usage rate of smartphones and applications can

increase. Especially in these processes, it would be appropriate to direct the teaching staff to the applications they use or thought to be useful if students use them.

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Author Information

Feyzi Kaysi

https://orcid.org/0000-0001-6681-4574

Istanbul University-Cerrahpasa

Istanbul

Turkey

Contact e-mail: *fkaysi@istanbul.edu.tr*

Mehmet Yavuz

https://orcid.org/0000-0001-6218-232X

Bingol University

Bingol

Turkey

Emrah Aydemir

https://orcid.org/0000-0002-8380-7891

Sakarya University

Sakarya

Turkey