





## Smartphone dependence and addiction among university students: Myth or reality?

### *Dependencia y adicción al smartphone entre el alumnado universitario: ¿Mito o realidad?*

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### Abstract

The advance and development of digital technologies has led to the smartphone becoming, nowadays, an integral part of human existence. This is particularly evident among the younger generations, who use it frequently in almost all facets of their lives. However, the disproportionate and unbalanced consumption of this type of device can generate a serious impact on their physical and mental health. This, together with the high employment rates of this group, means that their use is sometimes labelled as dependent and addictive. Therefore, this study aimed to identify the usage profile of university students with respect to the smartphone and to determine whether it is problematic. The research involved 350 students in the 1<sup>st</sup> year of the Bachelor's Degrees in Early Childhood Education and Primary Education at the University of Alicante (Spain). All of them completed a questionnaire on this topic. The data were processed with the statistical analysis program SPSS version 25, with which a descriptive study was carried out. The findings obtained indicate that, although sometimes the smartphone becomes a means to avoid loneliness, most of the participants presented a habitual user pattern linked to other users or networks. Therefore, from the perspective of university students, the use of this type of device cannot be described as dependent or addictive. For this reason, and considering its potential for learning, we conclude by stressing the need to integrate it into university classrooms but foreseeing the risks that its excessive use can provoke.

**Keywords:** Digital technologies, problematic use, higher education institutions, nomophobia, smartphone, university students.

### Resumen

El avance y desarrollo de las tecnologías digitales ha provocado que el *smartphone* sea ya parte integrante de la existencia humana. Esto resulta particularmente evidente entre las generaciones más jóvenes, quienes lo utilizan frecuentemente en casi todas las facetas de su vida. No obstante, el consumo desproporcionado y desequilibrado de este tipo de dispositivos puede llegar a generar un grave impacto en su bienestar físico y mental. Esto, unido a las elevadas tasas de empleo de este colectivo, provoca que en ocasiones su uso sea catalogado como dependiente y adictivo. Sin embargo, la adicción al teléfono móvil sigue siendo debatida entre la comunidad científica. Por ello, este estudio se propuso identificar el perfil de utilización del alumnado universitario respecto al *smartphone* y determinar si este es problemático. En la investigación participaron 350 estudiantes del 1<sup>er</sup> curso de los Grados de Magisterio en Educación Infantil y Primaria de la Universidad de Alicante (España). Todos ellos cumplimentaron un cuestionario sobre esta temática. Los datos se procesaron con el programa de análisis estadístico SPSS versión 25, con el que se realizó un estudio descriptivo. Los resultados indican que, si bien en ocasiones el *smartphone* se convierte en un medio para evitar la soledad, la mayoría de participantes presentaba un patrón de consumidor habitual, vinculado a otros usuarios o redes. Por tanto, desde la perspectiva del alumnado universitario, el uso de este tipo de dispositivos no puede ser calificado de dependiente o adictivo. Por ello, y a la vista de sus potencialidades para el aprendizaje, se concluye subrayando la necesidad de integrarlo en las aulas universitarias, pero previendo los riesgos que su uso excesivo puede ocasionar.

**Descriptores:** Tecnologías digitales, uso problemático, instituciones de Educación Superior, nomofobia, *smartphone*, estudiantes universitarios.

## 1. Introduction

The development of telecommunications in recent decades has caused mobile telephony, especially the smartphone, to be an essential tool in our daily life (Seel, 2022), linked to the digital aspect (Pangrazio and Sefton-Green, 2021). The multiple features it offers have significantly expanded its use in a way that more than 78bv% of the world's population has a smartphone (Statista, 2022). In fact, the use of smartphones in countries like Spain has grown by 102% during the last ten years (Europa Press, 2021). Some of the reasons that explain this remarkable increase lie in the almost unlimited possibilities it offers to communicate and participate in society (Cabero-Almenara *et al.*, 2019; de Almeida and Cabero, 2020; de Sousa *et al.*, 2022; Navarro-Mateos and Pérez-López, 2022; Roig-Vila *et al.*, 2021a; Roig-Vila *et al.*, 2021b; Salcines-Talledo *et al.*, 2020), qualities that have been more observed especially during the pandemic (Stevic *et al.*, 2022). Thus, it has been found that the use of the smartphone can be especially useful to improve health (Piaggio *et al.*, 2022), social integration (Jansen-Kosterink *et al.*, 2020; Roig-Vila *et al.*, 2020a) and even to promote the tourism and urban development of cities and rural communities (Javed *et al.*, 2021; Voda *et al.*, 2022).

However, the disproportionate use of this type of device, or other similar devices (Gómez *et al.*, 2021), can also be especially negative for the health of its users (Sohn *et al.*, 2019). As a result, a conglomerate of terms referring to the effects derived from the abusive consumption of the smartphone has been proposed, such as technostress (Yao and Wang, 2022), smombies (Hasan and Hasan, 2022), phubbing (Al-Saggaf and O'Donnell, 2019; Han *et al.*, 2022; Lai *et al.*, 2022; Rios *et al.*, 2021), vamping (Vedova *et al.*, 2022), Fear of missing out (FOMO) (Çatiker *et al.*, 2021; Li *et al.*, 2022) and nomophobia (Kara *et al.*, 2021). The latter concept, which arises from the abbreviation NO MO-bile PHOne phobia, refers to the fear generated by the impossi-

bility of using the mobile phone and which can lead to noticeably maladaptive responses in the subject (Aguilera-Manrique *et al.*, 2018; Anshari *et al.*, 2019; Bekaroğlu and Yilmaz, 2020; Elhai *et al.*, 2020; Zwilling, 2022), such as anxiety, depressive states, emotional imbalances or sleeping and feeding problems (Elhai *et al.*, 2017; Jahrami *et al.*, 2021; Rodríguez-García *et al.*, 2020). Because of the latter and with the aim of investigating the addictive capacity of this type of tools, this study aimed to identify the use profile of the smartphone among university students and to determine whether it is problematic.

Students, especially university students, are the ones who most use this type of devices (Ditrendia, 2020), thus being one of the most vulnerable groups to these problems (Alosaimi *et al.*, 2016; Jahrami *et al.*, 2021; Marín *et al.*, 2022; Martínez-Sánchez *et al.*, 2020; Oviedo-Tbackups *et al.*, 2019; Romero and Aznar, 2019; Ruiz-Palmero *et al.*, 2021; Yang *et al.*, 2021). It has worsened by the social isolation problems experienced during the recent pandemic (Zwilling, 2022). The maladaptive use of students is intimately related to the fear generated by being left out of their social network or the loss of information, if they are not frequently connected (Leonardi *et al.*, 2006; Servidio, 2021; Yuan *et al.*, 2021). Therefore, students manifest a constant need to check the mobile and have serious difficulties to silence it or shut it down in those situations in which its use is not allowed (Anshari *et al.*, 2019). In addition, the other problem lies on the notifications received on the device, which can end up becoming a particularly useful element to relax and avoid at certain moments of stress (Canale *et al.*, 2019; Panova and Lleras, 2016). Even in some cases students may experience separation anxiety or phantom vibration syndrome, despite not having received any notification (Sunitha *et al.*, 2020). When these types of behaviors are excessive and maladaptive, there is a high risk that academic performance will be affected, as well as sleep disturbances, difficulties in the ability to



concentrate, driving risk behaviors, a significant deterioration of health and, in the most severe cases, psychopathological disorders (Alkhateeb *et al.*, 2020; Busch and McCarthy, 2021; Cachón-Zagalaz *et al.*, 2020; Jahrami *et al.*, 2021; Lin and Zhou Rozgonjuk *et al.*, 2022; Romero-Rodríguez *et al.*, 2020; Rozgonjuk *et al.*, 2019).

Because of the later, studies have investigated the addictive capacity of the smartphone. In fact, for Simó *et al.* (2017) and Yu and Sussman (2020) compulsive and maladaptive use of the smartphone would be part of the so-called behavioral addictions, which explain why it is not included in the 5<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). This type of addiction does not require the use of any substance, but the improper use of the device generates changes in the behaviors of the subject and in his/her ability to self-control, so the person will have serious difficulties to regulate his/her use profile (Romero and Aznar, 2019). Likewise, it has been found that people who have this type of problems spend a large amount of time connected to their device (Romero and Aznar, 2019), which can cause symptoms very similar to those with other types of addictions (Pera, 2020). According to Ruiz-Palmero *et al.* (2019), one of these signs is the dependency syndrome that can be defined as the impulse and uncontrollable desire to use the device, even in situations where it is not allowed, a problem frequently observed in university students, especially those who are in freshmen (Sharma *et al.*, 2022). However, it is still an emerging addiction, so further research is needed in this area (Cuesta *et al.*, 2020; Yu and Sussman, 2020).

As a result, some studies have focused on examining the pattern of smartphone use among college students. Thus, it has been found that students from southern Europe, specifically from Italy and Spain, tend to have a lower self-perception of problematic use than their peers from northern countries, such as the United Kingdom or Belgium (López-Fernández *et al.*, 2017). In

addition, the use of the smartphone as a teaching resource is lower in Mediterranean countries, being used mainly for communication, interaction and leisure. Likewise, Marín-Díaz *et al.* (2020) showed the resistance of Spanish and Colombian students to categorize their use pattern as excessive. On the other hand, the investigation by Panova *et al.* (2020) with students from the United States, Spain and Colombia showed that although consumption was similar in the three countries, instant messaging services in Spain could become a major stressor for their users. In view of this background and considering the responsibility of higher education institutions to prevent addictive behaviors of students, this study was conducted with two objectives: (1) to identify the use profile of the smartphone among university students and (2) to determine if it is a problem.

## 2. Method

A quantitative methodology and non-experimental design were used (Campbell and Stanley, 1963), thus conducting a descriptive study (Hernández and Mendoza, 2018).

### 2.1 Participants

The non-probabilistic sample was structured by convenience sampling (Etikan and Bala, 2017). Specifically, 350 students from the University of Alicante (UA) (Spain) participated, who were enrolled in the first year of the bachelor's degree in early childhood and primary education. The reasons to have chosen this university as a context of analysis lie in its policy developed during the last years to integrate digital tools in the classroom. In this sense, it should be noted the special interest of the UA for using this type of devices to maximize the possibilities of active teaching methodologies, such as gamification (Ferriz-Valero *et al.*, 2020) or flipped classroom (Sentana-Gadea *et al.*, 2021).



Based on the sociodemographic profile of the sample, 75.4% of the subjects were under 20 years old, 76.3% were pursuing a bachelor's degree in early childhood and primary education and 75.7% were women, which is consistent with the feminization of this area of knowledge in Spain (Instituto Nacional de Estadística, 2022). In addition, almost all participants owned a smartphone (99.7%) and more than half admitted to use it during a daily period of four hours or more (55.1%), results aligned with the study of Salcines-Talledo *et al.* (2020).

## 2.2 Instrument

The data were collected using the scale designed by Bianchi and Phillips (2005), whose objective is to know the possible problematic use of the smartphone among adults. Specifically, the adaptation of the instrument by López-Fernández *et al.* (2012), given its wide use in the Spanish context and specifically with university students (Capilla and Cubo, 2017; de-Sola *et al.*, 2019; Marín *et al.*, 2018; Ruiz, 2016). This is a Likert scale with 5 response options, ranging from 1 ("Totally disagree") to 5 ("Totally agree"). Ranges go from 27 to 135 points, so higher scores are associated with more problematic smartphone use. Five closed questions were added to the 27 items that make up the scale. The aim of these surveys was to collect socio-demographic information: sex, age, qualification, whether participants had a smartphone and, if so, the average time of use in their daily life. The final instrument showed a high internal reliability index. The Cronbach's alpha analysis yielded a value of  $\alpha = .905$  for the set of items. To facilitate the dissemination and processing of data, the scale was built with Google Forms.

## 2.3 Procedure and analysis

Initially, the research team contacted the faculty of the Department of General and Specific Didactics (UA) who teach in the first course of

the degrees to ask for their collaboration in the study. Out of these, seven responded positively and allowed to apply the questionnaire to their students. The instrument was applied individually, during school hours and with the presence of one of the members of the research group. Before applying the instrument, students were told about the study's objectives, the voluntary nature of the participation and the confidentiality and anonymity of their answers. This same information, together with self-informed consent, was also included in the instrument. Also, the guidelines of the Helsinki Declaration and the guidelines established by the UA Research Ethics Committee (<https://cutt.ly/P1g6IBV>) were taken into account throughout the process. To facilitate the completion of the questionnaire, a QR code associated with the survey was created and was projected in each of the classrooms, allowing students to scan it with their smartphone. The average completion time of the instrument ranged from approximately 15-20 minutes.

Once the answers were recorded, the data were tabulated and statistically treated with IBM SPSS for Windows (version 25). A descriptive study was carried out to identify measures of central tendency, position and dispersion of the data set.

## 3. Results

The findings are presented based on the proposed objectives. Therefore, first the results of the descriptive study are shown and, ultimately, those related to the user profile are collected.

### 3.1 Problematic use of the smartphone

As shown in Table 1, the smartphone is a device used by university students, since 97.1% of respondents said that almost all their friends owned this type of device. In fact, a significant number of students recognized that sometimes it becomes a means to avoid loneliness and to



communicate with other people (67.4%). In addition, more than half of the respondents considered that if they did not have it, they would be unlikely to be able to contact their immediate environment (53.1%).

Moreover, it should be noted that a high percentage of participants admitted to spending more

time than they wanted on their devices (51.7%). On the other hand, they showed a more indecisive positioning regarding the possibility of prioritizing the use of the smartphone over other tasks (48.6%), sleeping problems (48%), the increase in the time of use during the last year (42.8%) or its use as a source of well-being (38.3%).

Table 1

*Problematic use of the smartphone among the students of the UA*

Ítem	1(%)	2(%)	3(%)	4(%)	5(%)	M	DT
1. All my friends have a cell phone	0,3	0,0	2,6	1,1	96,0	4,93	0,394
2. I have used my mobile phone to contact other people when I was alone	4,0	6,3	22,3	20,9	46,5	4,00	1,142
3. If I don't have a phone, my friends would not be able to contact me	8,0	14,0	24,9	25,7	27,4	3,51	1,250
4. The time I spend on my phone has increased over the past year	15,5	15,1	26,6	23,4	19,4	3,16	1,326
5. The use of the mobile has reduced my sleeping time	15,5	15,1	21,4	21,1	26,9	3,29	1,406
6. I spend time on my mobile phone when I should be doing other things, which causes me problems	8,3	17,7	25,4	28,3	20,3	3,35	1,220
7. I have trouble disconnecting my phone	22,6	20,6	22,8	16,0	18,0	2,86	1,405
8. When I'm talking on my phone and doing something else, I get involved in the conversation and ignore what I do	10,3	26,3	32,3	21,1	10,0	2,94	1,134
9. I'm hooked on my phone longer than I'd like	6,3	16,9	25,1	27,7	24,0	3,46	1,203
10. My friends don't like my mobile to be disconnected	42,0	23,7	17,7	8,6	8,0	2,17	1,279
11. If I'm not reachable, the thought of missing a call worries me	31,4	21,7	22,0	14,3	10,6	2,51	1,343
12. I feel nervous if I spend time without checking messages or if I haven't turned on my phone	23,4	30,3	24,6	15,1	6,6	2,51	1,191
13. I feel lost without my mobile	23,4	23,2	26,0	14,3	13,1	2,71	1,325
14. I've been told that I spend too much time using my cell phone	17,1	16,6	27,4	20,3	18,6	3,07	1,341
15. When I've felt bad, I've used my phone to feel better	18,3	18,3	25,1	21,4	16,9	3,00	1,345
16. My friends and family complain because I use my mobile a lot	26,0	26,2	22,6	16,9	8,3	2,55	1,267
17. I've tried to spend less time on my phone, but I can't	28,2	32,9	22,9	12,9	3,1	2,30	1,106
18. More than once I have been in trouble because my mobile has started ringing in class, in the cinema, in the theater, etc.	40,6	26,0	14,6	9,4	9,4	2,21	1,318
19. I'm always running out of time to get everything on my cell phone	33,4	25,2	22,9	9,1	9,4	2,36	1,285





Ítem	1(%)	2(%)	3(%)	4(%)	5(%)	M	DT
20. My performance has decreased because of the time I spend on my mobile	38,3	27,7	21,4	8,6	4,0	2,12	1,135
21. I spent more than I could afford on my mobile phone	57,7	20,9	12,0	5,1	4,3	1,77	1,114
22. Sometimes I would rather use my mobile phone than deal with other more is-sues	52,6	22,8	17,4	4,6	2,6	1,82	1,041
23. I have complaints related to the use of the mobile	53,7	22,3	16,0	5,4	2,6	1,81	1,055
24. I usually delay because I am hooked on my mobile when I shouldn't	65,1	19,7	8,3	4,6	2,3	1,59	0,979
25. It irritates me if I must turn off my phone in class, at meals, at the mov-ies, etc.	76,9	12,3	7,1	2,3	1,4	1,39	0,832
26. I've tried to hide the time I spend talking on my mobile	72,6	15,4	7,1	2,3	2,6	1,47	0,917
27. I usually dream about the mobile	91,7	5,4	1,4	0,6	0,9	1,13	0,532

At the same time, students rejected the possibility of experiencing difficulties to disconnect it (43.2%) or having received criticism from their family and friends as a result of their disproportionate use (52.2%). In fact, they stated that they were not concerned about missing a call because they were not reachable (53.1%). According to their answers, they were also not nervous about not being able to check messages (53.7%), and about not having time to solve smartphone-related issues (58.6%). They also rejected the idea that they would not be able to spend less time on the device (61.1%) or that their friends would not like to have it disconnected (65.7%). On the other hand, they denied that their academic performance could have been affected by the time spent on the smartphone (66%) or that they had been struggling to use it when it was not allowed (66.6%). Even greater resistance was shown to the fact that they experienced discomfort related with the use of the device (76%) and to have had excessive economic expenditure due to its abuse (78,6%). Especially significant was their opposition to the fact that they tried to hide the

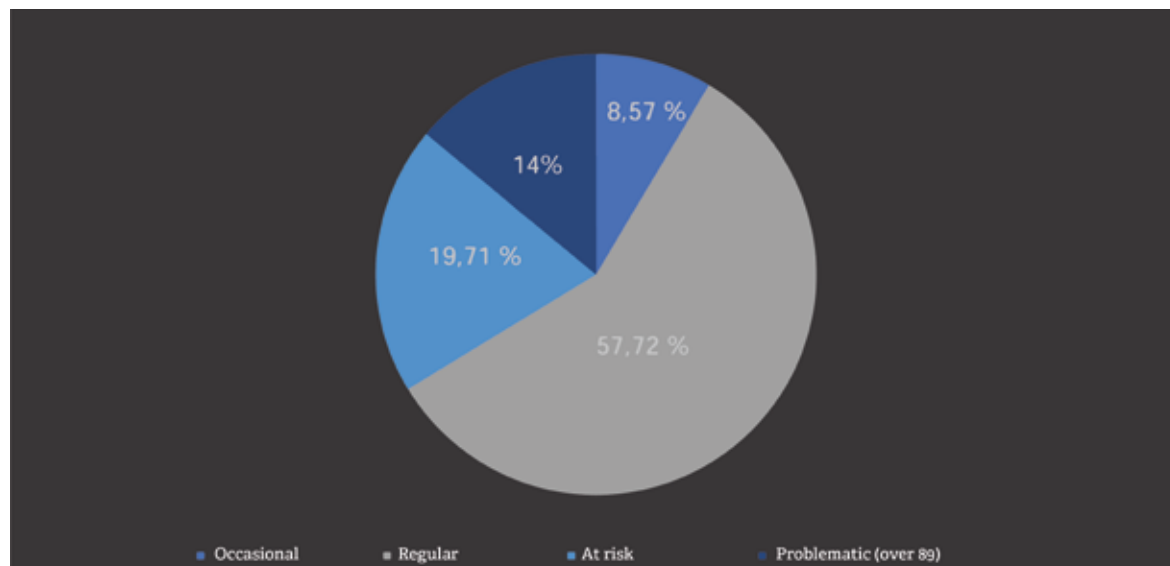
time spent on the smartphone (88%) and, above all, to have dreamed with it (97.1%), being these two items those who obtained the lowest average scores of the instrument.

### 3.2 Smartphone user typology

To identify the user profile of the smartphone, the statistical criterion used in previous studies of pathological gambling was taken as a reference (de-Sola *et al.*, 2019; López-Fernández *et al.*, 2012; Ruiz, 2016). It is based on the definition of three percentiles (15, 80 and 95), which give rise to four patterns: (1) casual consumer, (2) regular consumer, (3) consumer at risk and (4) problematic consumer (Chow *et al.*, 2009). In this case, the percentiles were established based on the scores of the sum of the set of items that make up the questionnaire (PC15 = 46; PC80 = 74 and PC95 = 88). According to this, more than half of the participants were defined as regular users, while 33.71% of the sample was classified within a profile at risk or problematic (Figure 1).



Figure 1

*Smartphone user typology*

#### 4. Discussion and conclusions

The digital transformation, as a result of the growing development of emerging technologies, has caused the smartphone to become a common tool among the youth (Roig-Vila *et al.*, 2020b). However, its disproportionate use can generate, in some cases, addiction and dependence, interfering negatively in the behavior of the subject and causing maladaptive behaviors (Aguilera-Manrique *et al.*, 2018; Alkhateeb *et al.*, 2020; Alosaimi *et al.*, 2016; Busch and McCarthy, 2021; Elhai *et al.*, 2020; Jahrami *et al.*, 2021; Lin and Zhou, 2022; Rozgonjuk *et al.*, 2019; Sohn *et al.*, 2019). From this perspective, this study aimed to: (1) identify the use profile of university students with respect to the smartphone and (2) determine if it is a problem.

As for the first objective, the findings showed that almost all the friends of the respondents had a smartphone, showing that it has become one of the most used tools of students to interact and socialize (Alosaimi *et al.*, 2016; Capilla and Cubo, 2017; Marín *et al.*, 2018; Ruiz-

Palmero *et al.*, 2021). The possibilities it offers in creating new environments of communication and participation make it a particularly useful resource for young people to build their interpersonal relationships (Cabero-Almenara *et al.*, 2019; Capilla and Cubo, 2017; Jansen-Kosterink *et al.*, 2020; Jahrami *et al.*, 2021; Oviedo-Trespalacios *et al.*, 2019). The latter is evidenced since the participants claimed to have used their smartphone to contact other people in case of feeling alone; results concomitant with those studies that show that the use of this type of device can become a strategy to avoid loneliness and semi-depressive states (de-Sola *et al.*, 2019; Leonardi *et al.*, 2006). However, despite the relaxed attitude granted to the smartphone, the students refrained from qualifying their use profile as addictive or problematic. In fact, they did not consider the time spent on it to be excessive, nor did they appreciate any inconvenience associated with its use. A similar position was previously found by Marín-Díaz *et al.* (2020) and Roig-Vila *et al.* (2020b), when mentioning that university students were reluctant to characterize as disproportionate their pattern of use.



This behavior could be related to the increasing integration of the smartphone in the daily life of students, especially during the recent pandemic, which could lead to normalizing its use (Roig-Vila *et al.*, 2021a; Zwilling, 2022).

Accordingly, participants rejected the possibility of presenting nomophobia. In fact, they were not worried about staying out of their social environment because they would not regularly check their device, had to turn it off, or felt lost when they could not use it. Moreover, according to their responses, they had never received criticism from friends or family for overusing the smartphone, nor had they come to dream about it. Although these results are in line with those obtained by Roig-Vila *et al.* (2020b), they differ from those found in previous studies, which show the serious consequences that its disproportionate use can generate in learning, attention capacity, sleeping time and physical and mental health (Anshari *et al.*, 2019; Busch and McCarthy, 2021; Cachón-Zagalaz *et al.*, 2020; Jahrami *et al.*, 2021; Lin and Zhou, 2022; Romero-Rodríguez *et al.*, 2022). Therefore, and in view of such differences, further research is needed to clarify these possible differences in the self-perception of university students.

In relation to the second objective, although a large number of participants acknowledged that they were at risk of using their smartphones abusively, more than half of them identified themselves as regular users. Although these findings are slightly inferior to those found by Marín *et al.* (2018), they are higher than those found by Roig-Vila *et al.* (2020b) and Ruiz (2016). In this sense, it should be noted that the instrument used for collecting the data was self-report, so, given the controversial nature of the questions, the answers of the participants could have been mediated by some kind of social desirability bias (Elhai *et al.*, 2020; Carbonell *et al.*, 2018; Krumpal, 2013). Therefore, the need to carry out complementary studies in this line arises.

Although this research contributes to offer knowledge in this area, it is not free of possible

limitations. The first limitation is related to the fact that only one data collection tool was used, it being self-assessment. For this reason, the use of complementary information collection techniques is proposed, such as the registration of data consumption or the organization of discussion groups with the most immediate environment of the student. In this way, it will be possible to triangulate the information and obtain a more realistic image of the smartphone's use profile among university students. Also, and according to Aguilera-Manrique *et al.* (2018), it would be advisable to consider the socio-family context of students in future research, since this could have influenced their use. On the other hand, the results of the research are limited only to students of Social Sciences, specifically Education, making it difficult to extrapolate the results to other areas of knowledge. Therefore, it is suggested to expand the study to other disciplines and institutions, in order to contrast the possible differences with other realities and contexts. Another limitation of the study is the number of female students that make of the sample. The higher number of female students among the participants may have influenced the results of the study, since it has been found that the use of the device is also affected by gender (Ruiz-Palmero *et al.*, 2019). Therefore, new research should also analyze the existing differences according to the age of the respondents, sex and level studied, since these aspects will allow a more accurate and adjusted profile of maladaptive use of the smartphone among university students.

However, despite the weaknesses mentioned above, this study complements the existing knowledge about the problematic use of the smartphone, while proposing new lines of research. It can be concluded that university students perceive themselves as habitual users and, therefore, reject the idea that their behavior can be categorized as dependent or addictive. It cannot be ignored that this is a self-report study and that a significant percentage of students know





that they are at risk, so if educational actions are not designed to favor their balanced and rational use (Martínez-Sánchez *et al.*, 2020), smartphone addiction will be an imminent reality.

These actions will be essential to properly integrate the smartphone in university classrooms and, thus, be able to take advantage of all the potentialities it offers for digital transformation and collaborative knowledge construction (Veytia *et al.*, 2018). These initiatives should also allow to promote the responsible and sustainable use of this type of device among younger generations, showing the consequences that its disproportionate and abusive use can generate on physical and mental health.

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