*Article*

# Problematic Smartphone Use in Spanish and Italian University Students

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**Abstract:** Sustainable education requires the proper usage of technological devices. Among these is the smartphone, which is used by millions of young people around the world in today's society. The objective of this study was to understand the smartphone usage profile of Spanish and Italian university students. It also aimed to identify possible problematic uses, and the differences in smartphone use (or abuse) between the participating subjects. The study was descriptive and comparative, with the intentional sampling of N = 1412 subjects studying at the education faculties of the University of Alicante (UA) and the Suor Orsola Benincasa University (UNISOB). A previously-validated questionnaire with 27 items was employed during the 2019–20 academic year. The data was analysed using the SPSS 25 programme. Descriptive and inferential analyses were carried out. The results obtained after the analysis of the data indicated that, of the four possible user types—occasional, habitual, at risk, and problematic—more than half of the sample identified themselves as habitual users. It can be concluded that there are significant differences between the universities: the UA students exhibited more problematic use than the UNISOB students. It is therefore necessary to prepare training programmes that are designed to avert problematic behaviours related to smartphone use.

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## 1. Introduction

The growing development of the mobile telephone has turned the smartphone into one of the technological tools that is used the most by human beings. This is reflected in the fact that there are currently 3.5 billion users all over the world, and this number is expected to continue to grow next year, reaching a total of almost 4 billion [1]. In fact, the penetration rate of mobile communications has already exceeded 100% in many countries [2]. Some of the reasons behind this accelerated process lie in the new forms of communication, information and participation that this new type of device makes possible [3–5]. It has been shown that these new forms can be especially useful in aiding community integration [6], transforming and democratizing society [7], boosting business innovation [8], and even improving health [9]. These factors have all contributed to these devices becoming an essential part of our lives and a decisive element for the configuration of new, sustainable societies [10,11].

On this point, it is worth emphasizing the importance of Sustainable Development Goal 4 (SDG 4) in the 2030 Agenda for Sustainable Development [12], which aims to considerably increase the number of young people and adults with the necessary skills to access employment, decent work, and entrepreneurship. Among these skills are so-called digital skills, which are directly linked to

ubiquitous learning with the use of devices such as the smartphone [13]. Within this context, the primary institutions advocate for a sustainable use of Information and Communication Technologies (ICT). Thus, under the slogan "Connect 2030: ICTs for Sustainable Development Goals", the International Telecommunication Union [14] has proposed that ICT—including the smartphone—should acquire a fundamental role in the achievement of smart and sustainable development, sponsored by the United Nations [15]. Along the same lines, the Council of the European Union has defined the 'European Digital Competence Framework' (DigComp) as a tool for the improvement of the digital competence of citizens [16]. The importance of these proposals lies in the link between the acquisition of certain skills and the proper use of ICT [17,18], with the aim of taking advantage of the possibilities is presents.

## 1.1. Nomophobia as a Problem Derived from the Inappropriate Use of Smartphone

Despite the unlimited potential offered by ICT in general and mobile technology devices in particular, the truth is that the smartphone can also be harmful and bad for the health of the user when its use is abusive and excessive [19]. In fact, a number of terms have been coined in scientific literature to refer to this set of damaging behaviours: technostress [20]; smombie [21]; phubbing [22]; fear of missing out (FOMO) [23]; and nomophobia [24]. The last of these—an abbreviation of the expression "NO MObile PHone phobia"—refers to the fear or anxiety provoked by being without a mobile phone for a period of time, which can elicit responses of a physical, physiological, and social nature [23,25–28]. In these cases, it often happens that the subject passes through four stages of increasing intensity: fear of being unable to communicate, fear of losing their connection, fear of being unable to access information, and fear of not having their phone to hand [29]. This phenomenon, which is increasingly significant among younger generations, can disrupt people's daily lives, causing—among other things—severe symptoms of anxiety, depression, and emotional instability, as well as eating and sleeping disorders [30–33].

The truth, however, is that—among the international scientific community—there is no clear position when it comes to the definition of this type of behaviour. Some authors qualify it as addictive behaviour [34–38], while others prefer to classify it as problematic use [39–43]. In such a context, it is important to stress that some of the symptoms that could lead us to identify the excessive use of smartphones with addictive behaviour are strongly influenced by some of the subjects' processes and psychological characteristics, such as impulsiveness, extroversion and neuroticism [44–48]. Other authors—such Elhai, Gallinari, Rozgonujk and Yang [49], and Yang, Asbury and Griffiths [50]—however, argue that the purpose for which the device is used—social or non-social—and a lack of self-control may be decisive factors regarding its being used in the wrong way.

Taking into account the fact that, in the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* [51] and the *International Classification of Diseases 11th Revision* (ICD-11) [52], excessive smartphone use has not been classified as addiction, the term 'problematic' has been chosen for this study. The lack of consensus and the scarcity of cross-cultural research in this area [53,54] has encouraged this study to investigate and compare maladaptive smartphone use among students from one Spanish and one Italian university. The interest in these two countries lies, fundamentally, in the findings of the study by López-Fernández et al. [55], according to which students in Higher Education in southern Europe (Spain and Italy) show a higher degree of dependence on smartphones compared to the rest of the continent. Hence, this study aims to identify and clarify the differences between the students of both countries. The discovery of possible discrepancies will not only make it possible to advance the knowledge about the abusive use of the smartphone in southern Europe, but also to design educational actions that are more appropriate and precise in order to address the real needs of each context, which in practice will favour a more adaptive and sustainable use of the smartphone among Spanish and Italian youth.

*1.2. Problematic Smartphone Use among University Students*

The high rates of smartphone use among university students make this one of the groups that is most at risk of manifesting problematic behaviours when using said device [42,56–60]. What is more, this trend seems to have increased over the last decade [39]. The causes behind maladaptive smartphone use are—to some degree—mediated by individuals' fear of being left out of their social network or missing important information if they are not constantly connected [61–63]. For this reason, young people feel an urgent need to check their phones constantly, and experience serious difficulties when it comes to silencing or turning their phones off when required [26].

This behaviour is also reinforced by the feeling of reward that users experience each time they receive a notification. This is especially true in stressful situations, in which the smartphone can become a resource for relaxing users and making them feel safe [64,65]. In fact, in some cases it is common for users to experience separation anxiety and phantom vibration or sound syndrome, even in the absence of notifications [66,67]. When this type of behaviour is excessive, it can disrupt students' daily lives, causing a number of negative issues. These issues include: trouble concentrating, trouble sleeping, a significant decrease in academic performance, an overly sedentary lifestyle, risky behaviour when driving, financial difficulties, the deterioration of health, and even serious psychopathological disorders [25,30,42,56,68–72].

One of the factors that seems to help explain the discrepancies in problematic smartphone use is the presence of sociocultural differences between university users [54,73]. As such, there is a need to address the problem from a broad, cross-cultural perspective, especially when digital devices are expected to contribute to ending poverty, and ensuring peace and prosperity for all [14]. In this context, one of the most ambitious investigations carried out is that of López-Fernández et al. [55], which analysed maladaptive smartphone use among university students from ten European countries. According to the results of this study, there are profound differences between the continent's various regions. For example, university students in Southern Europe exhibited a lower level of self-perception of problematic smartphone use than their counterparts in Belgium, the United Kingdom and France. In Spain and Italy, smartphone use was primarily dedicated to interaction and communication, while students in Northern Europe claimed higher levels of use for academic purposes.

Similar results have been found by Panova et al. [54], who analysed the effects of smartphone use in university students in the United States, Spain, and Colombia. Although the main uses of the device in the three countries coincided—exchanging messages, checking social media, and surfing the net—in Spain, instant messaging was a generator of anxiety. In contrast, the study by Leonardi, Leonardi and Hudson [74] revealed that, compared to Latin American and European users, those from the United States were more likely to use the device to escape loneliness and to reach out to other people. Marín-Díaz et al. [41], meanwhile, confirmed the low tendency displayed by Spanish and Colombian students to classify their use of the device as excessive, implying that they consider their patterns of use to fall within normality. Similarly, the results of the study by Višnjic et al. [75] of Italian and Serbian students could not establish a possible relationship between smartphone use and depression problems.

Based on this—and taking into account the importance of technological devices for the achievement of sustainable development—the present study was proposed, with the following objectives: (1) describing problematic smartphone use among students from one Spanish and one Italian university; (2) identifying the user types that the students represent; (3) contrasting the results obtained regarding maladaptive smartphone use between the universities involved in the study.

## 2. Materials and Methods

In order to achieve these objectives, a quantitative methodology was used, and a descriptive and comparative study was carried out [76].

## *2.1. Context*

The universities selected for this study were the University of Alicante (UA), in Spain, and the Suor Orsola Benincasa University of Naples (UNISOB), in Italy. The first is a public institution of higher education which is innovative and dynamic, and has an important profile in the national and international arena [77]. Proof of this is that, during the 2019–2020 academic year, it had 25,635 students enrolled, of which 4914 came from outside the province, particularly Valencia (20.61%), Albacete (18.46%), Murcia (10.72%), and Ciudad Real (6.61%) [78]. In addition, its privileged location and its facilities make it one of the favourite destinations for foreign students, especially Italians, given the similarity of the culture, language and climate. In fact, during the 2019–2020 academic year, the UA had 191 Italian students in its classrooms [78], which doubly justifies its consideration in this study. UNISOB, for its part, is a private university that was founded in 1885. Its long history, its wide educational offer, and its vast scientific–cultural heritage make it one of the most in-demand higher education centres in Italy and, therefore, one of the most representative in the country [79].

## *2.2. Sample Description*

The sample of 1412 students was formed by means of a non-probability convenience sampling technique [80]. The sociodemographic variables of the participants in relation to their university of origin and their studies in progress were as follows: 58% of the total were enrolled at the Faculty of Education of the UNISOB (Figure 1), while the remaining 42% were students at the Faculty of Education of the UA (Figure 2). The majority of the students from both universities were studying for a bachelor's degree.
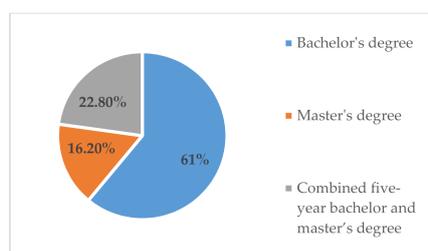


**Figure 1.** UNISOB Students.
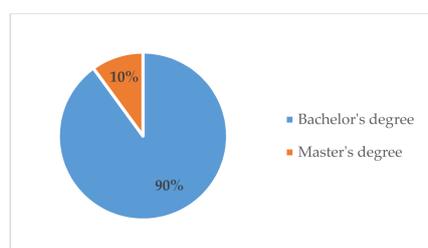


**Figure 2.** UA Students.

88% of the subjects were women, and 57% were aged between 20 and 25. Practically the entire sample stated that they had a smartphone (99.4%), and more than half acknowledged using it for 4 h a day or more (54%), an average that is slightly higher than that found by López-Fernández et al. [55] in their study of European university students.

## *2.3. Tools*

For the data collection, the questionnaire initially designed by Bianchi and Phillips [81]; carried out by López-Fernández, Honrubia-Serrano, and Freixa-Blanxart [82]; and used by de-Sola, Talledo, Rodríguez and Rubio [83] was adapted for use. This is listed in the Appendix A. The reasons that justify

its selection lie in its use in previous studies with a university population, such as in Ruiz [84], and in Marín, Vega, and Sampedro [85], as well as in its high degree of reliability. Specifically, in the Spanish version of the original tool, the coefficient was 0.97 [82]. Furthermore, in the present investigation, the analysis that was carried out showed a notable level of internal consistency for all of the items (=0.90). Furthermore, the information obtained for each of the items is closely related to the objectives that were set out in this current study, all of which explain their choice and use in the research.

The objective of this tool was to find out the possible problematic use of the smartphone. The survey utilises a Likert-type scale with five possible responses which range from 1 ("Totally disagree") to 5 ("Totally agree"). The ranges of the scale fluctuate between 27 and 135 points, so that the higher the score, the more problematic the smartphone use. In order to collect information of a sociodemographic nature, the authors added a series of closed questions to the 27 items in the survey instrument. Specifically, the participants were asked to indicate their gender, age, year of study, whether they had a smartphone, and—if so—how much time they spent using it each day.

Once the final questionnaire was prepared in Spanish, it was translated into Italian by a professional translation service and reviewed by a member of the research team. In order to facilitate its dissemination among the participants from both universities, the questionnaire was prepared online using Google Forms. This decision was taken because of the opportunities for the administration of surveys in higher education institutions that this software provides, including its ease of use, the fact that it is free of charge, and its automatic storage of data [86].

### 2.4. Procedure

In order to gain access to the sample, we first made contact with the Department of General and Specific Didactics (UA) and the Department of Educational Sciences, Psychology and Communication (UNISOB), and asked them to administer the questionnaires to their respective student groups. In total, 13 educators from UA and 19 from UNISOB agreed to collaborate. The analytical instrument was administered to each group during normal class hours and in the presence of one of the researchers from each university. The ethical considerations of the research were maintained at all times: the students were informed of the objectives of the study, the voluntary nature of their participation, and the anonymous nature of the data provided. In order to facilitate access to the online questionnaire, a QR code was generated ahead of time, which linked directly to the questionnaire. This was projected in each of the classrooms within which the data collection took place. The students were able to scan the QR code with their smartphone and thus access the survey more easily. The mean time for the completion of the survey ranged, at both universities, from 10 to 15 min. The data collection process covered a period of approximately two months, during the 2019–20 academic year.

### 2.5. Data Analysis

In the first instance, a descriptive study was carried out in order to identify the measures of the central tendency, position, and dispersion in the data set. Subsequently, a comparative analysis was carried out in order to identify the existence of possible differences in the problematic smartphone use among each of the participating universities. The Mann–Whitney nonparametric statistical U test was used due to the lack of normality in the data distribution (Kolmogorov–Smirnov test: $p < 0.005$). In addition, in the cases where statistically significant differences were observed, the magnitude of the effect was calculated, based on that stated by Rosenthal and Rubin [87] ($\geq 0.10$ = small effect size; $\geq 0.30$ = medium effect size; $\geq 0.50$ = large effect size). All of the analyses were performed with a confidence level of 95%.

The statistical package IBM SPSS version 25 was used to carry out these statistical calculations.

## 3. Results

The results are presented and organized according to the objectives set and the statistical analysis carried out. Thus, from the beginning, the descriptive data of the total sample is presented, followed by

the type of student smartphone user and, finally, the findings of the comparative study according to the university of origin.

### 3.1. Problematic Smartphone Use in the Total Sample

Table 1 shows the percentages, mean scores and standard deviations obtained in each of the items on the scale. Based on this data, it can be stated that the smartphone is a widely-used tool among the friends of university students (90.5%). However, they took a more tentative position regarding the idea of using a phone to overcome moments of loneliness or isolation (58.4%), the difficulties inherent in contacting friends by means other than their phones (51.6%), the excessive amount of time they dedicated to their devices (42%), and their increasing use of the smartphone over the past year (37%). Furthermore, the students denied that the smartphone served as a source of wellbeing (41.1%), and that they suffered problems due to the prioritization of smartphone use over other tasks (43.1%). They also rejected the idea that they felt lost without the smartphone (45.8%), that they found it hard to switch it off (48.5%), and that they had lost hours of sleep as a result of it (48.4%). They showed even greater resistance towards the idea that they had received criticism from their family and friends regarding excessive phone use (59.8%), and towards the idea that they lacked the time to attend to issues related to the device (64.6%). Especially significant were the opposition they expressed towards feeling anger at having to disconnect the device in certain situations (88%), towards hiding the amount of time they spent using the device from others (89.5%) and, above all, towards dreaming about their devices (96.3%); these items obtained the lowest mean scores on the scale.

**Table 1.** Problematic smartphone use in the total sample.

| Item | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | *M* | *SD* |
|---|---|---|---|---|---|---|---|
| 1. All my friends have a mobile phone | 0.5 | 0.8 | 8.2 | 5.3 | 85.2 | 4.74 | 0.681 |
| 2. I've used my mobile to talk to others when I feel lonely or isolated | 6.1 | 11.2 | 24.3 | 21.6 | 36.8 | 3.72 | 1.23 |
| 3. If I didn't have a mobile, it would be hard for friends to contact me | 8.6 | 13.6 | 26.1 | 23.4 | 28.2 | 3.49 | 1.26 |
| 4. The time I spend on my mobile has increased over the past year | 15.2 | 20 | 27.7 | 19.4 | 17.6 | 3.04 | 1.30 |
| 5. I have lost hours of sleep as a result of using my mobile | 28.3 | 20.1 | 19.8 | 15.5 | 16.2 | 2.71 | 1.43 |
| 6. I spend time with my mobile when I should be doing other things, and this causes me problems | 17.8 | 25.3 | 24.7 | 18.3 | 14 | 2.85 | 1.29 |
| 7. I find it hard to turn my mobile off | 25.8 | 22.7 | 21.4 | 14.7 | 15.4 | 2.71 | 1.39 |
| 8. When I talk on the phone while doing something else, I get caught up in the conversation and stop paying attention to what I'm doing | 20.3 | 26.7 | 29.5 | 14.7 | 8.8 | 2.65 | 1.20 |
| 9. I spend more time on my mobile than I'd like | 14.4 | 17.9 | 25.7 | 22.8 | 19.2 | 3.15 | 1.31 |
| 10. My friends don't like it when I turn my mobile off | 46.5 | 21.5 | 17.3 | 7.2 | 7.5 | 2.08 | 1.26 |
| 11. I worry about missing a call when I'm not reachable | 32.2 | 23.9 | 19.7 | 14 | 10.3 | 2.46 | 1.33 |
| 12. I get anxious if I spend too long without checking my messages or connecting my mobile | 28.1 | 27.2 | 24.6 | 13.1 | 6.9 | 2.44 | 1.22 |
| 13. I feel lost without my mobile | 22.6 | 23.2 | 25.9 | 15.6 | 12.7 | 2.73 | 1.31 |
| 14. I've been told I spend too long on my mobile | 25.5 | 21.6 | 25 | 14.9 | 13 | 2.68 | 1.34 |

**Table 1.** *Cont.*

| Item | 1 (%) | 2 (%) | 3 (%) | 4 (%) | 5 (%) | *M* | *SD* |
|---|---|---|---|---|---|---|---|
| 15. I've used my mobile to cheer myself up when I was sad | 20.6 | 20.5 | 26.7 | 16.9 | 15.4 | 2.86 | 1.33 |
| 16. My friends and family complain because I use my mobile a lot | 34.6 | 25.2 | 20.5 | 11.8 | 7.8 | 2.33 | 1.27 |
| 17. I've tried to spend less time on my mobile, but I can't | 36.9 | 29.8 | 20.7 | 9.3 | 3.3 | 2.12 | 1.11 |
| 18. I've got into trouble more than once because my mobile has started ringing in class, the cinema or the theatre. | 55.7 | 23.2 | 10.3 | 5.7 | 5.1 | 1.81 | 1.14 |
| 19. I never have enough time to deal with everything on my mobile | 39 | 25.6 | 22.6 | 7.6 | 5.2 | 2.14 | 1.17 |
| 20. I am less efficient due to spending too much time on my mobile | 47.5 | 27.6 | 16 | 5.9 | 2.9 | 1.89 | 1.06 |
| 21. I've spent more than I should or could pay on my mobile | 53.8 | 19.2 | 12.8 | 7.2 | 7 | 1.94 | 1.25 |
| 22. Sometimes I'd rather use my mobile than deal with more urgent matters | 55.8 | 21.7 | 13.7 | 5.2 | 3.6 | 1.79 | 1.08 |
| 23. I feel discomfort as a result of using my mobile | 54.1 | 21.2 | 15.6 | 5.9 | 3.2 | 1.83 | 1.09 |
| 24. I'm often late when meeting with people because I'm on my mobile when I shouldn't be | 64.4 | 17.6 | 10.1 | 4.8 | 3.1 | 1.65 | 1.04 |
| 25. I get in a bad mood if I have to turn my mobile off for class, dinner, at the cinema, etc. | 71.1 | 16.9 | 7.9 | 2.2 | 1.9 | 1.47 | 0.877 |
| 26. I try to hide how much time I spend on my mobile from others | 75.3 | 14.2 | 6.1 | 2.7 | 1.7 | 1.41 | 0.855 |
| 27. I often dream about my mobile | 91.9 | 4.4 | 2.5 | 0.5 | 0.7 | 1.14 | 0.532 |

### 3.2. Type of Smartphone User among University Students

In accordance with the existing literature, the statistical criteria used in pathological gambling studies [82–84] were taken as a reference for the identification of the profile of smartphone users. This is based on the use of three percentiles (15, 80 and 95) which correspond, in turn, to four types of user: (1) occasional, (2) habitual, (3) at risk, and (4) problematic [88]. In the present study, the percentages were established according to the scores of the summation obtained from the set of items that make up the scale ($PC_{15} = 46$; $PC_{80} = 74$, and $PC_{95} = 88$).

Based on this, more than half of the sample identified themselves as habitual users (Figure 3). In contrast, only 28% of the participants classified themselves as at risk or problematic.
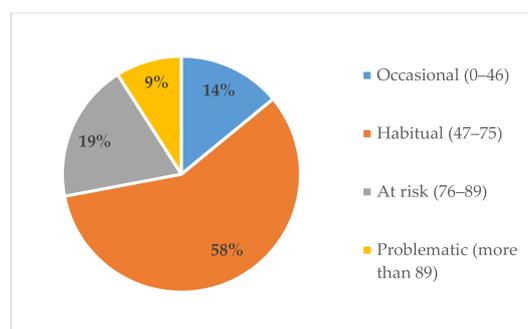


**Figure 3.** Type of smartphone user.

### 3.3. Problematic Use of Smartphones According to the University of Affiliation

When comparing the maladaptive use of the smartphone among the participating universities, statistically significant differences could be seen in most of the items on the scale (Table 2). In practically all cases, these differences were greater among the participants from the UA, who obtained higher average ranks than the UNISOB students, meaning that the former exhibited more problematic smartphone use.

**Table 2.** Problematic smartphone use according to university affiliation.

| Item | University | Mean Rank | U | p | z | r |
|---|---|---|---|---|---|---|
| 1. All my friends have a mobile phone | UA | 778.54 | 200,342.0 | <0.001 | −9.23 | 0.24 |
| | UNISOB | 653.42 | | | | |
| 2. I've used my mobile to talk to others when I feel lonely or isolated | UA | 802.61 | 185,923.5 | <0.001 | −7.90 | 0.21 |
| | UNISOB | 635.69 | | | | |
| 3. If I didn't have a mobile, it would be hard for friends to contact me | UA | 723.36 | 233,393.5 | 0.170 | −1.37 | - |
| | UNISOB | 694.08 | | | | |
| 4. The time I spend on my mobile has increased over the past year | UA | 739.65 | 223,639.5 | 0.007 | −2.68 | 0.07 |
| | UNISOB | 682.08 | | | | |
| 5. I have lost hours of sleep as a result of using my mobile | UA | 847.05 | 159,304.0 | <0.001 | −11.3 | 0.30 |
| | UNISOB | 602.95 | | | | |
| 6. I spend time on my mobile when I should be doing other things, and this causes me problems | UA | 815.28 | 178,336.0 | <0.001 | −8.80 | 0.23 |
| | UNISOB | 626.36 | | | | |
| 7. I find it hard to turn my mobile off | UA | 749.77 | 217,574.0 | <0.001 | −3.50 | 0.09 |
| | UNISOB | 674.62 | | | | |
| 8. When I talk on my mobile while doing something else, I get caught up in the conversation and stop paying attention to what I'm doing | UA | 803.72 | 185,257.0 | <0.001 | −7.91 | 0.21 |
| | UNISOB | 634.87 | | | | |
| 9. I spend more time using the mobile than I'd like | UA | 761.53 | 210,530.0 | <0.001 | −4.45 | 0.11 |
| | UNISOB | 665.95 | | | | |
| 10. My friends don't like it when I turn my mobile off | UA | 757.59 | 212,891.5 | <0.001 | −4.30 | 0.11 |
| | UNISOB | 668.86 | | | | |
| 11. I worry about missing a call when I'm not reachable | UA | 728.18 | 230,506.5 | 0.077 | −1.76 | - |
| | UNISOB | 690.53 | | | | |
| 12. I get anxious if I spend too long without checking my messages or connecting my mobile | UA | 740.11 | 223,360.0 | 0.006 | −2.74 | 0.07 |
| | UNISOB | 681.74 | | | | |
| 13. I feel lost without my mobile | UA | 686.24 | 231,355.5 | 0.101 | −1.64 | - |
| | UNISOB | 721.43 | | | | |
| 14. I've been told I spend too long on my mobile | UA | 767.86 | 206,741.5 | <0.001 | −4.97 | 0.13 |
| | UNISOB | 661.29 | | | | |
| 15. I've used my mobile to cheer myself up when I was sad | UA | 744.63 | 220,651.5 | 0.002 | −3.08 | 0.08 |
| | UNISOB | 678.40 | | | | |
| 16. My friends and family complain because I use my phone a lot | UA | 741.63 | 222,451.5 | 0.004 | −2.87 | 0.07 |
| | UNISOB | 680.62 | | | | |

**Table 2.** *Cont.*

| Item | University | Mean Rank | *U* | *p* | *z* | *r* |
|---|---|---|---|---|---|---|
| 17. I've tried to spend less time on my phone, but I can't | UA | 750.74 | 216,996.0 | <0.001 | −3.66 | 0.09 |
| | UNISOB | 673.91 | | | | |
| 18. I've got into trouble more than once because my phone has started ringing in class, the cinema, or the theatre. | UA | 825.45 | 172,244.0 | <0.001 | −10.4 | 0.27 |
| | UNISOB | 618.86 | | | | |
| 19. I never have enough time to deal with everything on my mobile | UA | 778.58 | 200,317.0 | <0.001 | −5.97 | 0.15 |
| | UNISOB | 653.39 | | | | |
| 20. I am less efficient due to spending too much time on my mobile | UA | 750.38 | 217,209.0 | <0.001 | −3.72 | 0.09 |
| | UNISOB | 674.17 | | | | |
| 21. I've spent more than I should or could pay on my mobile | UA | 634.33 | 200,265.5 | <0.001 | −6.25 | 0.16 |
| | UNISOB | 759.67 | | | | |
| 22. Sometimes I'd rather use my mobile than deal with more urgent matters | UA | 733.64 | 227,238.0 | 0.017 | −2.38 | 0.06 |
| | UNISOB | 686.51 | | | | |
| 23. I feel discomfort as a result of using my mobile | UA | 699.88 | 239,530.5 | 0.565 | −0.575 | - |
| | UNISOB | 711.37 | | | | |
| 24. I'm often late when meeting with people because I'm on my mobile when I shouldn't be | UA | 684.01 | 230,020.5 | 0.037 | −2.08 | 0.05 |
| | UNISOB | 723.07 | | | | |
| 25. I get in a mood if I have to turn my mobile off for class, dinner, at the cinema, etc. | UA | 663.97 | 218,017.5 | <0.001 | −4.22 | 0.11 |
| | UNISOB | 737.84 | | | | |
| 26. I try to hide how much time I spend on my mobile from others | UA | 712.33 | 240,000.0 | 0.541 | −0.611 | - |
| | UNISOB | 702.20 | | | | |
| 27. I often dream about my mobile | UA | 706.90 | 243,252.0 | 0.946 | −0.068 | - |
| | UNISOB | 706.20 | | | | |

Specifically, the use of the device was more generalised among the friends of participants from the UA (mean rank 778.54 UA vs. 653.42 UNISOB), and they also used it more to communicate at moments of loneliness and social isolation (mean rank 802.61 UA vs. 635.69 UNISOB). It was also the students of this university who acknowledged that their usage time had increased during the last year (mean rank 739.65 UA vs. 682.08 UNISOB), and that they had lost hours of sleep due to phone use (mean rank 847.05 UA vs. 602.95 UNISOB). The participants from the UA admitted, again, having more problems than their UNISOB counterparts due to putting their smartphones before other tasks (mean rank 815.28 UA vs. 626.36 UNISOB), and more trouble when it came to disconnecting the device (mean rank 749.77 UA vs. 674.62 UNISOB). UA students were also more likely to get carried away with phone conversations and ignore the environment around them (mean rank 803.72 UA vs. 634.87 UNISOB), and to have issues managing their work time due to their smartphone use (mean rank 761.53 UA vs. 665.95 UNISOB). Moreover, students from the UA admitted that they were incapable of spending less time on the phone even though they had tried to reduce the time they spent on it (mean rank 750.74 UA vs. 673.91 UNISOB), and confessed that they didn't have enough time to deal with all of the issues relating to their smartphones (mean rank 778.58 UA vs. 653.39 UNISOB). As a consequence, they had found themselves in embarrassing situations on more than once occasion (mean rank 825.45 UA vs. 618.86 UNISOB), and their academic performance had suffered more than that of their Italian counterparts (mean rank 750.38 UA vs. 674.17 UNISOB).

As shown in Table 2, UA students were more likely to feel anxious if they couldn't check their phones constantly (mean rank 740.11 UA vs. 681.74 UNISOB), more likely to use their mobile to cheer themselves up (mean rank 744.63 UA vs. 678.40 UNISOB), and more likely to prioritise phone use

ahead of more urgent matters (mean rank 733.64 UA vs. 686.51 UNISOB). The students from this university had also received more criticisms regarding the excessive time they spent on their phones (mean rank 767.86 UA vs. 661.29 UNISOB), especially from their friends and family (mean rank 741.63 UA vs. 680.62 UNISOB). Despite this, the friends of UA students were the most reluctant to disconnect their devices (mean rank 757.59 UA vs. 668.86 UNISOB).

On the other hand, UNISOB participants obtained higher average ranks than their UA counterparts when it came to excessive spending (mean rank 634.33 UA vs. 759.67 UNISOB), arriving late due to using the device (mean rank 684.01 UA vs. 723.07 UNISOB), and feeling uncomfortable due to having to turn the device off in certain situations (mean rank 663.97 UA vs. 737.84 UNISOB). However, it should be noted that the magnitude of the effect associated with this set of differences was small, except in Item 5, in which it was moderate.

## 4. Discussion and Conclusions

The growing development of digital technologies, especially mobile telephony, has resulted in the smartphone becoming an integral part of human life, especially among younger generations. So prevalent is the smartphone that, in some cases, it can negatively interfere with young people's behaviour, causing the manifestation of maladaptive behaviours [19,25,30,56,68,72]. Based on this fact, this study had three objectives: (1) to describe problematic smartphone use among university students from one Spanish university (UA) and one Italian university (UNISOB); (2) to identify the types of smartphone users among these groups; and (3) to compare maladaptive use according to university affiliation.

Regarding the first of these objectives, it should be noted that almost all of the friends of the students surveyed possessed a smartphone. This indicates that, in effect, the device is one of the primary tools for interaction among the student population [37,55,56,85]. The characteristics of the device and the possibilities it offers for the creation of new communication and participation environments make it an especially valuable resource for young people's interpersonal relationships [3,6,42]. In fact, the students generally admitted that they had used their smartphone to reach other people when feeling lonely or isolated, and that it would be harder for their friends to get in touch with them without the device. These results are consistent with those found by Leonardi et al. [74], whose study discovered that the device can end up becoming a strategy for students to escape moments of loneliness. Therefore, it is possible to affirm that a large part of the social fabric of participants is constructed and maintained through the use of the smartphone [55].

However, despite the importance that the device has acquired in students' interactions with their environment, they denied that its use could be classified in any way as problematic. The proof of this is that they did not consider the time they devoted to it to be excessive or to have increased over the past year. This same perspective was identified in the study by Marín-Díaz et al. [41], Ruiz [84], and Marín et al. [85], in which the participants were reluctant to classify their pattern of use as excessive or maladaptive. One possible explanation for this might lie in the device's increasing integration into their daily lives, which may lead them to normalise its use. In fact, according to Carbonell et al. [39], although the perception of problematic use among young people in the period between 2006 and 2017 was progressively increasing, a slower rate of growth was observed after 2013, as a consequence of social change.

In line with the above, the participants conveyed opposition to the concept of FOMO and nomophobia. In other words, they did not express concern about being left out of what was happening in their social environment due to not checking their phone frequently. In fact, they said they had no problem disconnecting their device and did not feel lost when they were not permitted to use it. Moreover, they rejected the idea that they had received criticism for the excessive use of their smartphone, that it had come to interfere with their obligations, and that their degree of dependency had led them to dream about it. These results contrast, however, with those obtained by Alosaimi et al. [56], Anshari et al. [26], Cachón-Zagalaz et al. [70], Romero and Aznar [36], Romero-Rodríguez

et al. [71] and Rozgonjuk et al. [72], who revealed the serious consequences that excessive use of the device can have on students' ability to concentrate, task performance, rest time, and health. Therefore, while this positioning may in some way be mediated by the growing normalization of the smartphone in their lives, it is no less true that additional research is needed in order to clarify these discrepancios in self-perception.

Regarding the second of the objectives, and in a manner consistent with their position, more than half of the participants described themselves as habitual users of the device, though a significant percentage acknowledged being at risk of compulsive use. Although these last figures turned out to be slightly lower than those found by Marín et al. [85], it is important to take into account that the data collection instrument was self-reporting, and that—given the controversial nature of the question—the subjects might be conditioned by social desirability bias [30,39,89]. Therefore, it would be useful to carry out complementary studies in order to attempt to confirm or deny this trend in the pattern of use.

Regarding the comparison of the problematic smartphone use between the two participating universities, it should be noted that, in practically all of the items, there were statistically relevant differences which revealed that UA students exhibit more maladaptive use of their devices. In contrast to their Italian counterparts, the Spanish students acknowledged more negative behavior, such as phubbing, nomophobia and FOMO, as well as the constant need to check notifications, a tendency to ignore the world around them while using their devices, and trouble trying to manage the time they spent on their devices. The UA students also admitted to more frequent use of the smartphone as an escape route at times of loneliness, isolation and stress—results which are concomitant with the study by Alosaimi et al. [56], Leonardi et al. [74], and Panova and Lleras [65]. However, Italian students exhibited higher financial spending on their smartphones, and a more pronounced discomfort due to having to disconnect their phone in certain situations, which coincides with the findings of Oviedo-Trespalacios et al. [42]. The explanation for these divergences could lie in the impact of sociocultural factors in problematic smartphone use—an issue that has already been stated by authors such as Mei et al. [59], Aguilera-Manrique et al. [25], and Panova et al. [54]. However, it should be taken into account that, as multiple studies [31,39,55,58] have shown, the problematic use of the smartphone is closely connected to participation in social networks. Therefore, another possible reason for these differences may lie in the greater use of social networks among Spanish university students, a factor the clarification of which will require more cross-cultural analysis.

We must remember that the three pillars of sustainable development—or, rather, sustainability [90]—are society, the economy, and the environment [10]. In this context, in which the smartphone is a common tool for information and communication, we should address the problems that may arise regarding its use, especially among young people. Only then can this tool become an ally in the achievement of what some call Society 5.0 [11]. The aim of this model of society is a better and more intelligent human being; one who develops knowledge and skills, and who guarantees secure data exchange.

Although this study contributes to the knowledge regarding the problematic use of the smartphone among university students, opening up new lines of research in cross-cultural studies on the subject, it must be recognised that it is not exempt from certain limitations. In the first instance, it is based solely on self-reporting, which—despite the anonymity of responses—may have conditioned the degree of the sincerity of the respondents due to the bias of social desirability. For future research, therefore, the use of other types of techniques—such as an analysis of the data consumption of their devices, or the collection of information from their immediate environment—is recommended in order to complete and triangulate the data. In this way, it would be possible to obtain a more accurate picture of problematic use of the smartphone. Along the same lines, it would have been useful to consider the social and family environment of the subjects, since this could have influenced their practices of use, as has been highlighted by previous studies [25]. In addition, the results of the research are limited to students of the social sciences—specifically, in the area of education—making it very difficult to generalize the results into other fields of knowledge like science, the arts, or the humanities. For this

reason, we suggest the expansion of the study to other disciplines and universities in order to compare excessive smartphone use with other realities and contexts. These new studies should be used, in turn, to identify possible differences according to students' age, sex, and year of study. All of this together will make it possible to define a more specific and accurate profile of maladaptive smartphone use among students of higher education institutions.

However, despite these aforementioned limitations, the truth is that the present research complements the existing results in cross-cultural studies on the maladaptive use of the smartphone, while raising new epistemological niches on the issue. Thus, it can be concluded that Spanish and Italian university students do not perceive themselves as problematic smartphone users, but rather as habitual users. In the comparison between the usage patterns of the participants from both universities, it is the Spanish students who show signs of more excessive smartphone use, approaching nomophobia. For this reason, it is necessary to design educational actions that favour a more balanced and rational use of this type of technology [58]. This is especially true if we hold out the hope that ICTs will contribute to the attainment of more sustainable development for humankind.

## Appendix A

Questionnaire: Problematic smartphone use among university students.

This questionnaire is part of a piece of research aimed at learning about the problematic use of smartphones by students from the Faculty of Education of the University of Alicante and the Suor Orsola Benincasa University of Naples. Recognising the importance of your participation, we inform you that the data collected will be treated completely confidentially. Therefore, we invite you to respond to each question in the most honest way possible. The data you contribute will be of great value for the study and for the improvement of smartphone use among university students, for which we thank you in advance for your invaluable participation.

Sociodemographic data:

Sex:

☐  Male
☐  Female

Age:

☐  Less than 20 years of age
☐  Between 20 and 25 years of age
☐  More than 25 years of age

Course type:

☐  Bachelor's degree
☐  Master's degree
☐  Combined five-year bachelor and master's degree (in the Italian version of the questionnaire)

Do you have a smartphone?:

☐   Yes

☐    No

Indicate your approximate daily usage of your smartphone on an average day:

☐   Less than 2 h a day

☐   Around 2 h a day

☐   Around 3 h a day

☐   Around 4 h a day, or more

Items:

Rates from 1 (Totally disagree) to 5 (Totally agree)

| Item | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. All my friends have a mobile phone | | | | | |
| 2. I've used my mobile to talk to others when I feel lonely or isolated | | | | | |
| 3. If I didn't have a mobile, it would be hard for friends to contact me | | | | | |
| 4. The time I spend on my mobile has increased over the past year | | | | | |
| 5. I have lost hours of sleep as a result of using my mobile | | | | | |
| 6. I spend time with my mobile when I should be doing other things, and this causes me problems | | | | | |
| 7. I find it hard to turn my mobile off | | | | | |
| 8. When I talk on the phone while doing something else, I get caught up in the conversation and stop paying attention to what I'm doing | | | | | |
| 9. I spend more time on my mobile than I'd like | | | | | |
| 10. My friends don't like it when I turn my mobile off | | | | | |
| 11. I worry about missing a call when I'm not reachable | | | | | |
| 12. I get anxious if I spend too long without checking my messages or connecting my mobile | | | | | |
| 13. I feel lost without my mobile | | | | | |
| 14. I've been told I spend too long on my mobile | | | | | |
| 15. I've used my mobile to cheer myself up when I was sad | | | | | |
| 16. My friends and family complain because I use my mobile a lot | | | | | |
| 17. I've tried to spend less time on my mobile, but I can't | | | | | |
| 18. I've got into trouble more than once because my mobile has started ringing in class, the cinema or the theatre. | | | | | |
| 19. I never have enough time to deal with everything on my mobile | | | | | |
| 20. I am less efficient due to spending too much time on my mobile | | | | | |
| 21. I've spent more than I should or could pay on my mobile | | | | | |
| 22. Sometimes I'd rather use my mobile than deal with more urgent matters | | | | | |
| 23. I feel discomfort as a result of using my mobile | | | | | |

| **Item** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 24. I'm often late when meeting with people because I'm on my mobile when I shouldn't be | | | | | |
| 25. I get in a bad mood if I have to turn my mobile off for class, dinner, at the cinema, etc. | | | | | |
| 26. I try to hide how much time I spend on my mobile from others | | | | | |
| 27. I often dream about my mobile | | | | | |

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