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THE USE OF SMARTPHONES BY UNIVERSITY STUDENTS WHO WORK: IDENTIFYING PARADOXES OF TECHNOLOGY

O USO DO SMARTPHONE PELOS UNIVERSITÁRIOS QUE TRABALHAM: IDENTIFICANDO OS PARADOXOS TECNOLÓGICOS

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ABSTRACT

With the advent of technology, smartphones have occupied a prominent place in their users' personal and professional lives. Thus, it is relevant to understand how the relationship between smartphones and individuals occurs, which may be paradoxical and not distinguish the positive and negative uses of the device. This situation may interfere in the lives of these people. This research is a descriptive study, which used univariate descriptive statistical analysis by means of data and Student's t-test; it was performed with individuals who face double shift (working and studying). We identified the presence of eight paradoxes, which can be classified into two categories: the first refers to the intimate relationship between individuals and smartphones, whereas the second concerns the functionalities of this type of device. This article also retrieves studies that have addressed the theme "paradoxes", making a comparison with this study. It was possible to notice differences and similarities over the years.

Keywords: Mobile communication; Paradoxes of technology; Smartphone.

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RESUMO

Com o advento da tecnologia, os smartphones estão ocupando um lugar de destaque na vida pessoal e profissional dos seus usuários. Assim, torna-se relevante entender como ocorre a relação entre o smartphone e o indivíduo. Esta relação pode se dar de forma paradoxal, não havendo a distinção do uso positivo e negativo do aparelho, situação que pode vir a interferir na vida destas pessoas. Este estudo se caracteriza como descritivo, no qual, através dos dados utilizou-se da análise estatística descritiva univariada e do teste t the Student, sendo realizada com indivíduos que enfrentam dupla jornada, trabalham e estudam. Identificou-se a presença de oito paradoxos, em que foi possível classificá-los em duas categorias: a primeira categoria diz respeito ao relacionamento íntimo do indivíduo com o smartphone, já a segunda diz respeito às funcionalidades do smartphone. O artigo ainda traz um resgate de estudos que abordaram o tema "paradoxos" realizando uma comparação com o atual trabalho, onde foi possível notar as diferenças e semelhanças ao longo dos anos.

Palavras-chave: *Comunicação móvel; Paradoxos Tecnológicos; Smartphone;*

1. INTRODUCTION

The worldwide strong integration of smartphones allows us to consider that technology has been becoming stronger, and people has feeling that staying always connected is a way of belonging to the contemporary world (Borges & Joia, 2015). In this context, we can notice that these technologies have been used to facilitate everyday life, optimizing communication between people, modifying the forms of entertainment, and even creating new media. Castells (2009) elucidates that technologies, whether mobile or not, can do more than change human behavior, they have the power to perform social transformations. However, for the working world, one of the technological features that most affect organizations and individuals' professional life in general is the ability to connect people and change their interactions. Thus, time between work and "not-work" would be reduced, affecting negatively the workers' lives (Cavazotte, Lemos & Brollo, 2014). According to Filho and Pitombeira (2016), the negative consequences are most commonly felt in workers' personal dimension than in their professional one.

Technological devices have already been inserted in organizations since the emergence of desktop computers, for at least two decades. Thus, we can notice that the use of Mobile and Wireless Information Technology (MWIT) is already part of organizations' and individuals' lives as a whole, i.e., within their private lives, being possible to work with MWIT away from workplaces (Saccol & Camarotto, 2013).

These mobile technologies are characterized by great portability and constant connectivity, generating a usage behavior as well as a behavior expectation (Mazmanian et al., 2006). Among these features, we can identify paradoxes, which are antagonistic behaviors. This fact becomes relevant as so far the amount of these products' supply increases, so does their use in both professional and private life. Still, it must be noted that what is in progress is a change in social interaction and behavior. Devices such as smartphones, tablets, PDAs (personal digital assistants), notebooks, netbooks, among countless others, flood the market and become ubiquitous (Tapscott, 2010). Tapscott still reflects on internet omnipresence, taking not only MWIT to any place and context, but also the "permanent" connectivity, which allows us to be in touch with everyone and everything in several places, therefore, allowing work contact in any place and moment.

The use of these devices constantly increases due to the facilities they provide. Our search for flexibility, whether at work or in personal life, enables the increasing centrality of these devices in our lives. As Sorensen (2011) recalls, flexibility at work has acquired various forms, such as teleworking, homeworking, virtual global teams, and mobile workforce. The

flexibility movement has also caused work to follow workers anywhere, so that their presence within the office can be reduced. However, it is noteworthy that absence from the office does not mean distance from work. Thus, this search for flexibility is present in many aspects of contemporary life.

In order to achieve mobility and flexibility at work, technologies that enable these features are necessary. They allow people to remain connected to their personal and professional lives. This flexibility helps in overlapping these spheres, not allowing individuals to differentiate their professional or personal roles only by time or place. Thus, we can note that, for example, such devices can cause a sense of independence (as they allow personal contact at work) and dependence (as they take work to individuals all the time), as well as other paradoxical feelings/behaviors (Jarvenpaa & Lang, 2005).

Therefore, understanding how MWIT interference process occurs in individuals' daily lives, whether in organizational or personal context, is relevant to comprehend this new emerging configuration. As MWIT increasingly allows demands to reach individuals, we notice a clear difference between the way labor relationships used to be and their configuration nowadays with the presence of MWIT (Sorensen, 2011). Junges (2015) interprets this new context as a socio-technical paradigm due to the advancement of mobility, which transforms organizational relationships. His study corroborates Pellanda's (2006) research, which had already identified that space relationships are transformed when accessing information in mobile devices.

The use of these technologies and their transformations allows us to observe paradoxes of their use, which consist in the perception of their concomitant benefice and "harm". Thus, paradoxes are contradictory deliveries of positive and negative points at the same time, linked to the same point. Seeking to understand this phenomenon, some researchers engaged in its study. We can cite as examples of researchers who seek to understand the paradoxes of MWIT internationally: Mick and Fournier (1998), Jarvenpaa and Lang (2005), Mazmanian, Orlikowski and Yates (2006), and Sorensen (2011). In Brazil, we have studies of authors as Gonçalves and Joia (2011), Corso, Freitas and Behr (2012), Borges and Joia (2013), Corso (2013), Bruzzi (2013), and more recently Oliveira et al. (2015), and Filho and Pitombeira (2016).

Thus, the present study aims bringing the reader the answer to the following research question: What are the paradoxes of using smartphones in the practices of university students who work? Thus, our general aim is to identify which paradoxes are manifested in the practices of using smartphones of university students who work, setting up a double shift.

In this sense, we seek to understand the impacts of using smartphone, which has been increasingly gaining space within individuals' lives. Understanding this use is justified as it is important to know how this technology has and/or can affect working within organizations as technologies have the potential to change workers' productivity and to mean a social transformation. Thus, knowing how these devices can impact individuals' satisfaction and productivity, and well as any other areas relevant to work and humanity, must be an object of observation by the academy.

2. THEORETICAL REFERENCE

This chapter presents the theoretical framework necessary for understanding this topic. It is divided in three parts: mobile and wireless technologies; professional and personal lives, and paradoxes of mobile communication.

2.1 MOBILE TECHNOLOGIES: TIME AND SPACE MOBILITY

According to Corso (2013), mobility is a new paradigm that has transformed certain human behaviors, conferring them portability. Thus, studying, communicating, having access to entertainment and working depend less and less of a local infrastructure and, therefore, of a fixed location. According to the author, technological and infrastructure advances provide the basis for mobility to take effect. As for Sorensen (2011), mobility is a product of the miniaturization of computing devices, combined with the possibility of their permanent connectivity. Therefore, for the author, a mobile device must have at least the combination of portability and connectivity as essential characteristics. He also adds that, in the case of mobile computing, a peripheral device that is geographically mobile but is not able to connect is a non-mobile technology.

Saccol and Reinhard (2007) divide mobile technologies into three different categories. The first is Mobile Information Technology and consists of devices characterized by portability, i.e., the possibility of carrying them with us is their greatest feature. The second one is Wireless Information Technology and designates those devices that have portability, in addition to the ability to connect to networks with no aid of wires or other devices. The third designation used is Ubiquitous Information Technology, which indicates those ubiquitous technologies, i.e., technologies that are everywhere and, therefore, are imperceptible to the user.

They still had another category, Information Technologies Nomads, which carry the mobility of organizational contexts, besides the portability of service. It means that, through nomadic computing, it is possible to work for an organization even outside its context, thus making portable not only the device and its connectivity, but also the organizational context. To enable it, the authors emphasize the necessity of mobility, large-scale infrastructure and convergence (Saccol & Reinhard, 2004).

Amongst the most notorious mobile technologies are smartphones. Jarvenpaa and Lang (2005) see these devices as the first truly personal computer, as they align communication and mobility and distinguish from usual computers as they are almost always close to users. Their continuous availability enables users to employ them to express their personal identities. Thus, it is possible to emphasize the gradually greater centrality that MWIT has acquired in individuals' lives.

Therefore, mobile technologies are technologies that can be geographically displaced along with their users, who seek facilities and advantages through their use. Users look for basically two major benefits on mobile devices: consuming available content and producing content (share it/make it available). Regarding this search for content, Gonçalves and Joia (2011) expose the "push and pull" technology.

One of the technological innovations that has expanded the idea of instantaneity is "push" technology, which "pushes" information to the user. This technology opposes to "pull" technology (users need to search information) and has changed the relationship logic between individuals and information. It was boosted by the advent of smartphones.

From mobile technologies, for Kakihara and Sorensen (2001), mobility can be in three different dimensions: space, time and the context. Thus, we can verify that mobility has not only an objective perception (geographical), but also a subjective one. Therefore, technologies of mobile computing give space and mobility, so that, in different contexts, individuals can play different roles in increasingly shorter times, thus meeting the expectations of contemporary lifestyle. However, the decrease in time between activities modifies the interaction relationships between individuals as well as their personal and professional relationships.

Therefore, mobility becomes a channel that makes individuals feel omnipresence of mobile technologies (Junges, 2015). It may lead to the presence of one or more paradoxes in the interaction of an individual and its smartphone. Besides, according to Junges, even if a person works in a defined physical space, the use of mobile technology modifies its relationship with work, increasing its involvement in work activities.

Therefore, it is of great importance to consider mobile contexts that individuals experience daily, as they are characterized by the actions taken by the mobile technology user and how they were planned (Tamminem, Oulasvirta, Toiskallio & Kankainen, 2004). Since each user has a different interpretation of its mobile context, interpretations can be positive, negative or paradoxical.

2.2 PARADOXES OF MOBILE TECHNOLOGY

The word "paradox" has a sense of contradiction, ambiguity, and antithesis. It is precisely this dimension of the word that is used to describe certain impacts of MWIT. These impacts can be positive, negative, or concomitantly positive and negative, thus admitting the form of a paradox. Jarvenpaa and Lang (2005) argue that the negative and positive impacts of mobile technologies are inseparable, and they grow in intensity as new technologies are launched.

Thus, in order sufficiently clarify the paradoxes brought by the present study, we will present the paradoxes based on the authors who deal with the theme, and not each isolated paradox.

2.2.1 The paradoxes for technology products from Mick and Fournier (1998)

Mick and Fournier (1998) were some of the first researchers/scholars to discuss the paradoxes of technology. They conducted studies in order to understand the impacts of technologies in general consumer behavior of technological devices. As a result, they found eight paradoxes. The first, **Control vs Chaos**, exposes that technologies generally provide the facilitation of controlling tasks; however, they can cause clutter and chaos at any moment, taking users' control of the situation. Thus, users may be led to misusing the technology, whether by abandoning or excessively using it.

The second paradox, **Freedom vs Enslavement**, refers to the feeling of freedom and independence provided by technology as it provides a leap in the performance of activities. However, the authors state that the use of technology can also bring a dependency, called as enslavement. It is noteworthy that the first two paradoxes are related to each other as both represent master and slave alternating each role (in the subjective sense).

The third, **New vs Obsolete**, states that when consumers acquire a new technological good, they feel satisfied with its benefits. However, after a short period of acquisition, they have the impression that it is outdated.

The paradox **Engaging vs Disengaging** regards the question of technological potential to engage people by providing facilities to ease their involvement; however, these facilities can make people so comfortable, they disengage. In the same sense, **Efficiency vs Inefficiency** states that technologies can both save time and make people spend time in them. Thus, we can find efficiency as tasks are optimized, and inefficiency as more time is spent using technology.

Fulfills vs Creates Needs is the product of users' satisfaction of desires needs by one device. However, the same device can also create new needs and desires, thus causing an antagonism. The paradox **Integration vs Isolation** concerns a social aspect. The individual feels more

integrated with the world by using some technology. However, the same technology may also isolate the individual from other people.

Finally, the paradox **Competence vs Incompetence** deals with the feeling of competence people have when they can perform tasks that once they could not as they use devices. However, when they face difficulty in operating them, the feeling is the opposite, a complete incompetence.

2.2.2 The paradoxes of mobile technology from Jarvenpaa and Lang (2005)

As they previous authors, Jarvenpaa and Lang (2005) also researched paradoxes of technologies, but they have directed their studies for mobile technologies. Even so, some of their results coincided; four of eight paradoxes found by Jarvenpaa and Lang (2005) were identical to those exposed by Mick and Fournier (1998): Freedom (Empowerment) vs Enslavement; Competence vs Incompetence; Fulfills vs Creates Needs, and Engagement vs Disengagement.

In the first paradox, **Freedom vs Enslavement**, through the permanent connectivity of mobile devices, users gain the freedom of performing various activities remotely. However, this permanent connectivity keeps users hostage, since it "forces" them to be constantly connected to people/tasks. The term "slavery", therefore, has the sense of dependency, taking users' power and centrality in situations.

Competence vs Incompetence is the ability to do anything, anytime and anywhere with the use of MWIT, thus giving users of mobile technology a set of new capacities. However, this set can negatively affect other competencies, making users incompetent in something they were once capable.

The paradox **Fulfills vs Creates Needs** presents how mobile technologies can provide solutions to existing issues, but in contrast they may also create new problems and needs to be fulfilled. Thus, the same feature may fulfill a users' need and create another one; for example, mobility provides more security as it allows people to be in contact, but ironically this security seems to create a new sense of vulnerability, generating fear when thinking about the possibility of losing it (Jarvenpaa & Lang, 2005).

Engaging vs Disengaging describes the possibility of mobile technology to engage people in one type of communication and disengage them in another at the same time. Users from the study of Jarvenpaa and Lang (2005) reported that engaging with technologies of mobile communication can lead them to disengaging of face-to-face social activities. Thus, it allows people to escape a space and moment to another parallel, such as mobile phone and internet.

The paradox **Dependence vs Independence** states that mobile technology provides freedom, enabling communication from anywhere with anyone, but they also confer the concern of being always communicable, since individuals may think that people are trying to talk to them when they are not connected.

Planning vs Improvisation regards that, on the one hand, users can benefit from the provision of planning tools, thus allowing them to better coordinate meetings, plan works and other activities. However, on the other, by knowing that technology gives them some powers, users tend to take less time and effort in organizing their schedules, relying on technology, which allows them to mask their lack of preparation with continuous improvisation. Thus, disorganization may happen, and technology can generate chaos if misused.

Public vs Private refers to the fact that the use of mobile technologies is related to individuals' private sphere, but their actual use tends to occur in public places. Then, the use of these technologies can interfere in the privacy of individuals around them.

Finally, the paradox **Illusion vs Disillusion** states that users expect to be able to have total mobility when acquiring a mobile technology, using it anywhere and anytime. However, they may be disappointed when realizing that there are certain limitations for its use. These limitations may be infrastructural, such as no coverage, or even related to the battery charge.

2.2.3 The dualities of using smartphone from Mazmanian, Orlikowski and Yates (2006)

Mazmanian, Orlikowski and Yates (2006) have performed a research with interviews in order to study the social implications of using smartphones. As a result of studies, three types of concomitant antagonistic behaviors were found. The first one was **Continuity vs Asynchronicity**. Such behavior is reported to be the possibility conferred to users to be available to contact all the time, keeping a communication flow. In contrast, the same technology can give them the possibility to choose the most convenient time to respond a contact. For example, we can have an e-mail, which can be easily accessed by means of a mobile technology such as notebook or PDA; however, the individual can choose a more opportune moment to reply and do not reply instantly.

Another feature of using smartphones is the possibility to be in remote contact with both work and family, so that we can eventually leave the office, as we may keep performing the task remotely. Therefore, there is a certain flexibility and autonomy conferred to the worker, as well as a permanent contact, since there is a "moral commitment" of remaining contactable/available permanently for this autonomy. This situation represents the second duality: **Autonomy vs Addiction.**

The third conflict is **Engaging vs Disengaging**. Smartphones provide the possibility of communication when users are far away, approaching and engaging people. However, when individuals are close, smartphones can hinder their engagement to communicate with each other, since they can disperse their attention. This characteristic may also be the cause of conflicts within organizational or even personal relationships.

2.2.4 The paradoxes of technological performance of mobile workforce from Sorensen (2011)

Sorensen (2011) deals with more three conflicting behaviors regarding mobile technologies. His perspectives are associated with **Control, Collaboration**, and **Creativity**. It must be noted that these "variables" are related to the performance of functions at work and, therefore, the research and paradoxes occur within the working environment. The variables are antagonistic when opposed, being either **fluid** or **bounded**.

Corso (2013) notes that the terms "fluid" and "bounded" concern the either planned or more "natural" way in which activities are developed. **Bounded** variables are characterized as having their use previously planned and are limited to it, thus establishing and maintaining the limits of use. **Fluid** variables flow from a "natural" interaction, with no prior planning or limits previously established, and use all available technology resources.

3. METHOD

The present research is a descriptive and quantitative study. The convenience non-probabilistic sampling was adopted as it allows only those who were willing to collaborate to participate in the research (Hair, Babin, Money & Samouel, 2005). During a four-week period, we visited Administration major classes in a federal university from the countryside of the state of

Rio Grande do Sul (RS – Brazil) in order to collect answers from students who studied and worked, using smartphones for some purpose. At the time of collection, Administration major classes had the approximate number of 400 students out of which 78 were suitable to participate in the survey. In order to achieve these individuals, filter questions were used to eliminate students who were not within the scope of the research.

To collect data, questionnaires of quantitative nature were applied. The questions were formulated from previous bibliographic review. The questionnaire was designed with three different blocks and three different objectives. The first block aimed to verify the general profile of the sampling students; the second block aimed to understand their profile as smartphone users, and the third block aimed to identify the paradoxes of using smartphones, adapted from tests of Gonçalves (2012) and Corso (2013).

For data analysis, univariate descriptive statistics were used. Student's t-test was used to evaluate the significance of differences between the means (positive and negative perspectives) found in the results (Hair et al., 2005).

4. RESULTS AND DISCUSSION

In this section, we analyzed the results, starting on the description of the profile of the sampling students, followed by their profile as users of mobile technology, and finally identifying the paradoxes.

4.1 DATA ON SAMPLING STUDENTS' PROFILE

The sample consisted of men and women, having a slightly higher number of male participants (51.3%) in relation to female (48.7%). The age of the individuals was distributed from 19 to 49 years-old; 57.1% were concentrated up to 25 years-old, and the mean age was 26.91. The age most replied was 23 years-old (13%), followed by the age of 21 years-old (11.7%), and in third place, the ages of 24, 22, and 29 years-old were tied (7.8%).

Regarding marital status, all the options were answered. The number of single individuals was the highest (64.1%); 19.2% were married, and 12.8% were in stable companionship. This phenomenon may be explained by the age distribution. Out of the large choice of answers regarding the individuals' occupation, 41% affirmed to be employees of firms and private businesses; 26.9% were civil servants, and 24.4% were interns (it may also be understood by the age distribution and environment where this research was conducted). These three occupations are responsible for 92.3% of the results. This value reaches 98.7% if we add those who declared to be owners of the businesses where they work. Regarding the business area of the companies, the answers were quite diverse, with no specific emphasis.

Finally, the last question regarded their income, revealing that 57.1% of the individuals gained from one to three minimum wages, which was expected since the main age group observed is beginning their professional lives, whether as effective employees or interns. Those who claimed to earn from three to five minimum wages accounted for 19.5% of the total responses, and those who earn up to a minimum wage corresponded to 16.9%. Thus, a total of 93.5% earns up to five minimum wages.

Therefore, the profile of this study sampling is young individuals, mostly single, working in private and public organizations, some being interns. Due to the age group, the majority declared to earn from one to three minimum wages, and in general there were no income higher

than five minimum wages. After analyzing the profile of the sampling students, we will describe their profile as smartphone users.

4.2 DATA ON SMARTPHONE USERS' PROFILE

Most participants (66.2%) said that their current smartphone was their first device of this type, and 33.8% of them affirmed they had owned other smartphones before. Out of all individuals, 34.3% had more than one smartphone, and 7.2% had three or more. The brands most cited were Samsung (44), Motorola (14), Nokia (13), LG (7), Apple (6), Sony (3), CCE (2), HTC (1), and others (1).

The mean time respondents have owned their device was 2.27, in years. Almost 80% of them have had their smartphone for three years or less. Only 5.1% of the survey participants have had this type of device for six years or more; the number of people that claimed to have had smartphone for five years is 2.6%. Individuals with smartphones for at least five years account for almost 8%; this result is related to the fact that the category of smartphone handsets was launched in 2007 (launch year of the first iPhone, for example), almost seven years before the questionnaire was applied.

Almost half of participants (51.3%) said that they use the device from one to four hours a day; 16.7% use it from five to eight hours a day. Those who use from nine to twelve hours and from thirteen to sixteen hours constitute 7.7%. Finally, 16.7% said that they use their smartphones over sixteen hours a day.

Regarding the type of activities that were carried out with the device, 83.3% reported to use it to talk to friends; 70.9%, to access their virtual social networks; 50%, to perform work-related activities; 61.5%, to exchange emails; 41%, to play games; 43.6%, to watch videos; 11%, to perform other leisure activities, and 1.3%, for other activities.

Concerning the type of internet connection, 70.5% used wi-fi network at home; 41% said they use wi-fi network at work; 42.3% stated they use public wi-fi networks; 61.5% used mobile internet in their smartphones, and finally 1.3% said they have another type of connection. It is noteworthy that the answers to this question (and the next one) were not mutually exclusive and, therefore, an individual may have replied he/she has more than one type of connection.

The next question concerned the reason why individuals had acquired their device. A number of 48.7% said they have acquired their smartphones in search for a source of leisure; in contrast, 23.1% said they have bought for work-related reasons; 16.7% said they have acquired on impulse, and 44.9% have bought it as an admirer of technology. Only 5.1% said they bought it as a form of adequacy, i.e., because other people are using it. The group of those who confessed to have bought it by influence of other people was equally small (6.4%), as well as the number of people who said to have bought it for other reasons (6.4%). Those who said they have purchased it based on smartphone functionality accounted for 71.8%.

We verified that the profile of users of mobile technology is well-differentiated. Several brands were purchased for different reasons; many individuals claimed that their device was their first smartphone; respondents used all sources of internet access and claimed to use their devices first for leisure, followed by the need for work. This result tends to affect individuals' experiences, since they use the same device for functions that can stand out each other. Finally, after finishing this description of profiles, we shall describe the paradoxes arising from the use of smartphones in the following section.

4.3 PARADOXES IN USING SMARTPHONE

First, for clarification, analyses were guided by the significance (sig) values; when they were smaller than 0.05, the non-presence of the investigated paradox was verified. The presence of the paradox was observed when the sig value was greater than 0.05, as it indicates the non-statistical difference between the means. Therefore, the response does not stand for either the positive or negative aspect of the sentence, giving a paradoxical perception of the respondents. Table 1 presents the results of Student's t-test, which allows the inference on the existence or non-existence of the paradox.

Table 1 – Results for Student's t-test

Paradox	Sentence/ Positive aspect	Mean	Sentence/ Negative aspect	Mean	p value	Paradox-presence
Control vs Chaos	9	3.79	23	2.13	0.992	Yes
Freedom vs Eslavement	10	4.04	24	2.62	0.033	No
New vs Obsolete	11	4.37	25	2.93	0.593	Yes
Competence vs Incompetence	12	3.23	26	2.19	0.857	Yes
Efficiency vs Inefficiency	13	3.74	27	2.62	0.898	Yes
Fulfills vs Creates Needs	14	3.40	28	2.92	0.109	Yes
Integration vs Isolation	15	4.08	29	2.73	0.218	Yes
Dependence vs Independence	16	3.64	30	2.81	0.000	No
Planning vs Improvisation	17	3.78	31	3.29	0.011	No
Ilusion vs Disillusion	18	3.95	32	2.79	0.003	No
Continuity vs Asynchronicity	19	4.22	33	3.68	0.035	No
Engaging vs Disengaging	20	4.07	34	2.25	0.563	Yes
Autonomy vs Addiction	21	3.86	35	3.47	0.000	No
Public vs Private	22	2.73	36	2.47	0.001	No
Fluid Collaboration vs Bounded Collaboration	37	2.81	38	2.82	0.052	Yes
Fluid Control vs Bounded Control	39	2.39	40	2.38	0.000	No
Fluid Creativity vs Bounded Creativity	41	2.29	42	2.86	0.033	No

Source: The authors.

The paradoxes are experienced by individuals when they feel benefited and harmed at the same time by using mobile technology, in this case, smartphones. Therefore, individuals cannot distinguish whether smartphones facilitate and enhance their relationships with the environment, or they are harmed by their use.

Out of the seventeen paradoxes (evidenced on the literature), eight could be supported by the results of this research, and nine were not identified. The paradoxes found in the study sampling were: Control vs Chaos; New vs Obsolete; Competence vs Incompetence; Efficiency vs Inefficiency; Fulfills vs Creates Needs; Integration vs Isolation; Engagement vs Disengagement, and Fluid Collaboration vs Bounded Collaboration.

Therefore, we identified paradoxes that have already been observed by authors such as Mick and Fournier (1998), Jarvenpaa and Lang (2005), Mazmanian, Orlikowski and Yates (2006), and Sorensen (2011). There are paradoxes of several characteristics; the first two authors showed broad technological paradoxes, whereas the last two authors approached the technology typified by intelligent devices such as smartphones.

By demonstrating the existence of paradoxes in our analyses, we can identify that the means of positive aspects are always higher than the means of negative aspects. This result indicates that even if there is paradoxical feeling (it is not possible to distinguish whether the use of smartphone is positive or not), the students investigated tend to perceive more the positive characteristics of using this device than the negative, characterizing a good relationship between user and technology.

Curiously, the paradox Fluid Collaboration vs Bounded Collaboration presents the closest means among all paradoxes identified, demonstrating that individuals are totally undefined,

hanging neither more to the positive nor the negative pole. This result can be explained by the intimate relationship between user and smartphone, and users cannot distinguish how they collaborate with others through smartphones. In the same sense, we can justify the presence of paradoxes such as Control vs Chaos; Competence vs Incompetence; Efficiency vs Inefficiency; Integration vs Isolation, and Engagement vs Disengagement. Their interaction with the device becomes so natural that users no longer distinguish the situation as being good or bad.

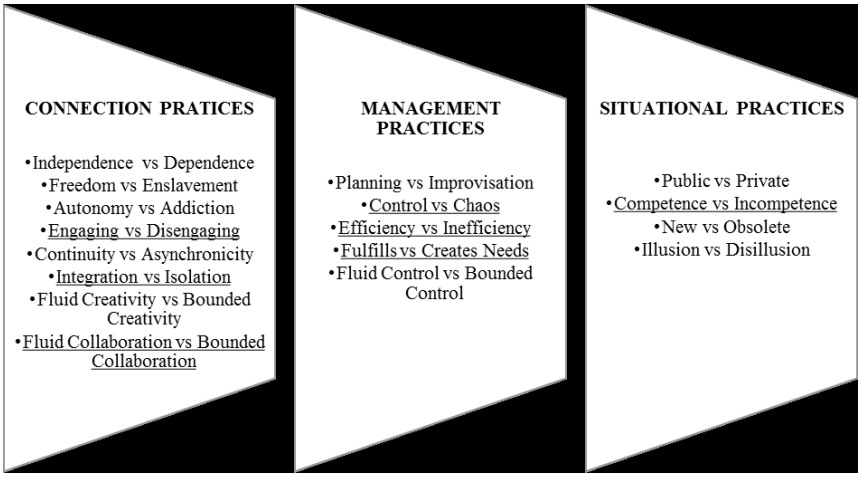
Such paradoxical situations are part of their relationships and daily life, and they become habitual and have no discernment. This interweaving between human and technology was regarded by Orlikowski (2007; 2010) as **socio-materiality**. This author understands that the social (human) and the material (technology) are closely linked, essentially constituting this socio-material relationship.

The paradoxes New vs Obsolete and Fulfills vs Creates Needs are related to the experience of using in the perspective of smartphone resourcefulness, characteristics of the device and its functionalities. The first paradox is linked to users' perception of the technology acquired. Even if it is a new device for users, due to updates and tech advancement, their device may already be outdated when compared to technological launches. The second paradox is related to users' expectation for their device to meet their needs by helping to solve problems, but they identify new needs as using it, which the current device cannot solve.

Therefore, it can be said that there are two general categories that characterize the experience of university students who work in their use of smartphones. The first is related to the direct relationship between student and smartphone, which causes an intimate connection and no separation in their acts involving the device (socio-material relationship). The second concerns the functionality of smartphones and what it provides for its users.

Based on Corso (2013), who classified the paradoxes regarding their socio-material practices of using, it is possible to identify three classifications: connection, management, and situational practices (Figure 1).

Figure 1 – Classification of paradoxes by using practices



Source: Adapted from Corso (2013).

According to the author, connection practices are related to paradoxes associated with the connectivity power that users can enjoy. Paradoxes related to the management practices involve elements regarding the administration. Finally, situational practices encompass the paradoxes that involve situational aspects felt by users, "taking into account the spatial and temporal aspects" (Corso, 2013, p.

160). It may be noted that the paradoxes underlined were identified in this study (Figure 1). Thus, there was a balance between classifications, i.e., we identified paradoxes of the three types of classification, and there was no prevalence of a characteristic type in the group of students investigated.

4.4 SCENARIO OF STUDIES ON TECHNOLOGIAL PARADOXES

The theme of paradoxical mobile communication has been significantly and internationally concerned in the last two decades. However, in Brazil, it has been discussed for less time due to its tech advancement and more specifically to its personal smartphones advancement. Thus, to obtain an overview of the studies previously published in Brazil and which paradoxes are most perceived in this country, Table 2 was created. It summarizes Brazilian studies and makes a comparison to our research. We emphasize that the articles presented were chosen based on the keywords "mobile technology", "paradoxes", and "mobile communication" in the SPELL (Scientific Periodicals Electronic Library) repository database, in ANPAD (Brazilian Association of Postgraduate and Research in Administration) events, and in general internet search engines.

Table 2 - Summary of Brazilian studies on paradoxes of mobile communication

ARTICLE	AUTHOR	STUDY OBJECTIVES	PARADOXES SUSTAINED BY THE STUDY	RESULTS COMPATIBLE WITH THIS STUDY
An investigation of the paradoxes in the relationship between executives and smartphones	Gonçalves; Joia (2011)	Can technological paradoxes identified and extended to a number of technologies also be found in the relationship between executives and smartphones? If the answer is positive, which paradoxes are most strongly visualized in this relationship?	Freedom vs Enslavement	
			Independence vs Dependence	
			Planning vs Improvisation	
			Continuity vs Asynchronicity	
			Autonomy vs Addiction	
Executives, Sex and Smartphones: An exploration of technological paradoxes and copying strategies	Gonçalves (2012)	Identifying the existence and intensity of paradoxes associated with the daily use of smartphones by Brazilian executives of both sexes	Freedom vs Enslavement	
			Independence vs Dependence	
			Planning vs Improvisation	
			Continuity vs Asynchronicity	
			Public vs Private	
			Autonomy vs Addiction	
The Paradoxes of Using Mobile Information Technology: the Perception of Faculty who uses smartphone	Corso; Freitas; Behr (2012)	Identifying which paradoxes are evidenced in the use of smartphones by the university faculty	Freedom vs Enslavement	
			Fulfills vs Creates Needs	√
			Continuity vs Asynchronicity	
Executives and smartphones: an ambiguous and paradoxical relationship	Borges; Joia (2013)	Identifying the existence of paradoxes associated with the daily use of smartphones by Brazilian executives	Continuity vs Asynchronicity	
			Autonomy vs Addiction	
			Freedom vs Enslavement	
			Independence vs Dependence	
			Planning vs Improvisation	

Managers' socio-material practices: Investigating the paradoxes of mobile technology use in a higher education institution	Corso (2013)	Identifying managers' profile on mobile technology use	Control vs Chaos	√
			Efficiency vs Inefficiency	√
			Independence vs Dependence	
			Freedom vs Enslavement	
			Autonomy vs Addiction	
			Engaging vs Disengaging	√
			Continuity vs Asynchronicity	
			Integration vs Isolation	√
			Public vs Private	
			Fluid Colaboration vs Bounded Collaboration	√
			Fluid Control vs Bounded Control	
			Fulfills vs Creates Needs	√
			New vs Obsolete	√
			Illusion vs Disillusion	
Paradoxes of Technology in the use of Smartphone as a working tool	Filho; Pitombeira (2016)	Planning vs Identify paradoxical perceptions regarding smartphones, given the impact of the use of smartphones on the professional life of its users	Autonomy vs Addiction	
			Independence vs Dependence	
			Integration vs Isolation	√
			Freedom vs Enslavement	
			Public vs Private	
			Fulfills vs Creates Needs	√
			Continuity vs Asynchronicity	
			Efficiency vs Inefficiency	√
			Engaging vs Disengaging	√
			Ilusion vs Disilusion	
			Planning vs Improvisation	

Source: The authors.

We can notice that there are still few studies in Brazil that deal with this theme and that they aim to identify, not so profoundly, the presence of paradoxes and do not analyze the causes and consequences. Thus, Brazilian studies have not yet matured, as its context is changing very rapidly. Thus, a scope for new studies has been opening the horizon of knowledge on paradoxes of technologies in this country.

Looking at Table 2, we notice that the scenarios studied are not varied, analyzing only executives and faculty. However, it is noteworthy that in all studies the paradoxes Freedom vs Enslavement (Mick & Fournier, 1998); Jarvenpaa & Lang, 2005) and Continuity vs Asynchronicity (Mazmanian, Orlikowski & Yates, 2006) were identified.

Thus, Brazilians maintain a strong integration with their smartphone to the point of not discerning if the use of their devices causes positive or negative effects. This aspect may be based on the perspective of socio-materiality, which asserts that there is an interrelationship between social and material in the practices of using technology.

In the case of the Freedom vs Enslavement, individuals cannot administer the use of their devices, since they are always available for use at work and with family, and it is not possible to discern whether this fact is positive for their relationships or not. The paradox Continuity vs Asynchronicity is related to users' power to control the moments when they will be connected, but as this paradox exists, we can verify that individuals are not having clearly control.

In the work context, individuals who are constantly connected feel obliged to respond to the demands of work at the same moment they appear, no matter where they are (Cavazotte, Lemos & Brollo, 2014). Devices can facilitate users' independence but also difficult it (Mick & Fournier, 1998). Over time, it may become natural for employers to demand their employees to respond to certain work issues at off-work time, impairing their personal lives. However, the continuity or asynchronicity can and must be controlled by users (Mazmanian, Orlikowski & Yates, 2006). Therefore, these two paradoxes have a connection with the power of users' self-control, in the attempt to balance personal and professional lives without harming their interpersonal relationships.

5. CONCLUSIONS

With the advent of mobile technology and the miniaturization of handsets (Sorensen, 2011), communication has become easier and more dynamic, and the space between employees and employers has narrowed. The search for flexibilization has evidenced the mobile context, which enables workers to accomplish their tasks via smartphones, out of their workplace. This situation has transformed organizational relationships (Junges, 2015). Thus, individuals may experience paradoxical feelings regarding the use of their smartphones as they allow people to have an intimate connection between personal and professional lives.

This study proposed to bring new elucidations on the relationship between human and technology, seeking to answer which are the paradoxes of using smartphones in the practices of university students who work. Our emphasis was on the relationship between people who face double shift and their use of smartphones, aiming to understand whether the device helps in their activities or not.

The sample of this study consisted mostly of young people who work in both the public and private sectors, earning from one to three minimum wages. As for their experience with smartphones, most individuals were enjoying their first device; there was no predominance in preference for any specific brand, and there were several reasons why people had acquired it. It is noteworthy that users employ their device primarily for leisure, followed by their need for work. This result is the first evidence that the relationship between human and smartphone can be paradoxical, since the main uses of smartphones correspond to different life spheres (personal and professional).

From Student's t-test, we could verify the presence of eight paradoxes out of the seventeen discussed in this paper. They are: Control vs Chaos; New vs Obsolete; Competency vs Incompetence; Efficiency vs Inefficiency; Fulfills vs Creates Needs; Integration vs Isolation; Engaging vs Disengaging, and Fluid Collaboration vs Bounded Collaboration. Thus, our second evidence is the possible categorization of the characteristics of the paradoxes that were supported, regarding the use of smartphones in the sample studied.

The first category refers to the close relationship of students and their smartphones, causing moments in which it is difficult to separate if their use is positive or negative. The second concerns the functionality of smartphones and what they provide for their users, as well as what is expected of their resourcefulness. Such experiences are pointed out by Orlikowski (2007, 2010) as an interrelationship between human and technology, in which there is a tangled relationship between the social (human) and material (technology).

Finally, in order to make a comparison between the studies performed on this topic in Brazil and our research, a collection of the studies involving the paradoxes of mobile communication was performed. We observed that there are still few studies in this theme, which are not deep, allowing for further research. As a limitation of this study, there was little participation of university students. A suggestion for new studies is deepening the causes and consequences of the paradoxes identified in order to better understand this new and unstable phenomenon.

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Contribution	[Author 1]	[Author 2]
1. Definition of research problem	√	
2. Development of hypotheses or research questions (empirical studies)	√	√
3. Development of theoretical propositions (theoretical work)		
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	√
6. Data collection	√	
7. Statistical analysis	√	√
8. Analysis and interpretation of data		√
9. Critical revision of the manuscript	√	
10. Manuscript writing	√	√
11. Other (please specify)		