

# Profiling mobile TV adoption tendencies by college and university students in Portugal

(Does previous individualized TV consumption influence the adoption of mobile TV?)

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## 1. Introduction

Greek philosopher - Heraclitus considered that “change” is the only constant reality in our world; according to him it proposes itself as: “the divine law that underpins all human law” (Robinson, 1991)<sup>2</sup>. In the past few years there has existed a keen interest of telephone companies and media corporations to deliver media contents (such as TV) to handheld devices using next generation infrastructures based on IP and other wireless technologies. A critical factor for this aspect resides in the growth of their technological penetration in society and in the fact that the convergence of mobile connected devices and the Internet have summoned innovative delivery systems<sup>3</sup>. For example, in Portugal 99,9% of the population have a TV set, 50,5% use a laptop computer, 88,5% own a mobile phone and 4,2% declared that they use a Smartphone regularly (Marktest, 2012;

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2) Regarding this aspect, tradition tells us that man has always presented himself through his inquisitive nature. This characteristic has encouraged scientific discoveries and technological achievements proposing a constantly morphing landscape throughout man’s history.

3) The mainstream use of mobile connected devices that will have a worldwide growth of 1.2 billion in 2014..

Paisana Miguel, 2012). In the Q1 of 2011 Portugal registered a total of 2.107 mobile broadband subscribers and in the Q1 of 2012 it already registered 2.252 – this is a 15% annual growth rate of connectivity (Anacom, 2012)<sup>4</sup>.

Concerning Internet content consumption – 75.8% declared that use it to watch TV content – 3.7% said they did through their mobile phones (Cardoso, 2012; Paisana Miguel, 2012). These trends show that there exists an increasing interoperability between platforms - an expansion of TV consumption away from home<sup>5</sup>. It is from this scenario that Mobile TV (mTV) emerges. In fact, today it does not make sense to regard mTV as a standalone service<sup>6</sup> 7. As we will see in the following pages it is already regarded as a connected player of an increasingly richer TV experience based on ICT (Information Communication Technologies) (Montpetit *et. al.*, 2010).

## 2. Theoretical Background – Trends and Specifications

### 2.1 From Mobile Media to Mobile TV

Historically, mobility's relationship with "media" is intertwined. It began with books, newspapers and progressively telephone, radio and TV followed (Zwick, 2010). Digitization created a new communication paradigm based on

4) Q – Quarter.

5) Concerning this issue, some scholars consider "Nielson's Three Screen Report" is outdated because the Tablet (e.g. Apple's iPad) is establishing itself as a "fourth" screen (ibid., 2008; Aguado, 2009; ibid., 2011; Aguilar, 2007).

6) Regarding this issue we can recall services i.e. "TV Out" that features in new "Smartphones" (such as Samsung Galaxy SIII, iPhone 4S and iPhone 5) and the SNS (Social Network Service) Integration. Regarding the first proposal, we are basically addressing an app that transforms the mobile phone into a portable STB (Set Top Box); the second issue regards applications (i.e. apps) that endure connectivity, based on the mobile phone's features, with Social Networks – such as "Facebook", "Twitter" etc. These traits are also regarded as hybrid solutions.

7) Besides this, as previously referred, mTV is also regarded as being part of IPTV (TV through Internet Protocol). IPTV is traditionally defined as multimedia services i.e. TV, audio, text, data that are delivered over IP – based networks (Simpson, 2006). Mobile IPTV endures users with the possibility to transmit and receive these same contents through their mobile devices (Schatz *et. al.* 2007).

ICT convergence – “mobile media” and progressively the ability to consume TV through a mobile phone (mTV) (Carlsson & Walden, 2007; Goggin, 2006). Therefore, it is understandable that the convergence between TV and the mobile phone proposes itself as a logical development stage (Carlsson & Walden, 2007).

Currently, due to its varied nature (utilitarian, instrumental, emotional and entertainment), the mobile phone is considered as an extension of ourselves – it is regarded as our: “personal miniature representative” (Katz, 2006, Levinson, 2004). Today, this device converges several communication specifications i.e.: “interactivity”, “globalization”, “virtualization”, “one-to-one” and “many – to – many” media exchange possibilities (where TV is included) (Ganito, 2010; S Orgad, 2006). This coherence between mobile devices, digitization and media is proposing TV as an expandable and accessible medium through a myriad of access points (Buonanno & Radice, 2008; Chorianopoulos, 2008; Palmer, 2008). This medium proposal can be witnessed through the existence of current systems such as IPTV and storage “cloud systems” based on ICT (Apple TV, TiVo and Google TV); within them, we can see the omnipresence of integrated and accessible TV content for fixed and mobile devices (Lai, *et, al.*, 2011)<sup>8</sup>. These consumption trends reveal our true “polytheistic” nature because we would rather consume several images through various devices equipped with screens instead of only one (Martins, 2011)<sup>9</sup>.

But is not this proposal similar to the one Marshall McLuhan made involving “light through” as opposed to “light on” (*ibid.*, 1962)? Through this theoretical scope, medieval stained images in cathedrals propose a glimpse of another world. Following in this scholar’s scope, we can propose that the current digital revolution surpassed the technologies of light (luminous) over technologies of

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8) Based on the theoretical trademarks promoted by Zygmunt Bauman in his book “Liquid Society”, the term – “Liquid Medium” was coined to specify the role portrayed by Mobile 2.0 where hybridization, fragmentation, context dependency, ubiquity, accelerated evolution and the fluidity that comes from social networking implications are defined by the role that mobile devices portray in current society where Bauman’s “Liquid Society” is represented in their core (Aguado & Martinez, 2009).

9) Moisés de Lemos Martins looks at the current multiplication of images by enduring in a thought process where we summons Old Testament biblical comparisons and considers that they endure a rebellious proposal of creating innumerable images through ICT mediation where man can only be polytheistic (*ibid.*, 2011).

matter – that move physical objects through space (*ibid.*, 1962). That accent has shifted to technologies of self radiance. Now we dwell in a world that consists of an increasing number of self – luminous screens of all shapes and sizes where mTV is included.

## 2.2 – Mobile TV specifications and content supply – an overall image

We define mTV as the “convergence” of two of the best – selling consumer products in history – “Television” and “mobile phones” (Shatz, *et. al.*, 2007). It proposes the transmission of TV content through a range of wireless devices where mobile phones are included (Kumar, 2007; Montpetit *et. al.*, 2010).

Historically, mTV’s media proposal has its roots based on services such as SMS (Simple Message Service) and MMS (Multimedia Message Service) (Goggin, 2011). Besides unconditional “geographical freedom”, due to the used reception device (the mobile-phone), this type of TV service also proposes other traits such as “interactivity” (two-way communication possibilities) and “mobile intimacy” – an aspect that extends “individualized” and “social” trends when the TV is consumed by using the mobile phone (Shatz, *et. al.*, 2007). Based on these traits, we can generically state that the incursion of this device into our lives has led us to discover new hybrid forms of activating embryonic forms and new experiences. And mobility is not only based on the movement of individuals but on the movement of media contents between people, devices and the web (Manovich, 2008). So, it is understandable that some scholars consider that mTV summons similar issues as the ones that occurred with the implementation of TV in the 1950’s (i.e.: the reduced screen size) and ambivalent questions regarding its delivery (Bria, *et. al.*, 2007). Concerning this issue, there exist four handset reception proposals (de Renesse, 2011; Kumar, 2007)<sup>10</sup>:

10) Besides these proposals, there exist two other modalities - 1) “Repurposed Content” – consists of linear content adapted for better viewing on a smaller screen and 2) “Specific Mobile TV content” – content designed specifically for mTV (Shuurman, *et al.*, 2009).

1. “Sideloaded” (transferred from a PC or a Laptop);
2. “Bluetooth Sharing” (via Handset);
3. “Broadband streaming” - is a one-to-one, personalized, “anytime anywhere” content access through traditional cellular networks ;
4. “Mobile TV Broadcasting” - “one-to all” content transmission where TV is broadcasted to mobile handsets.

In what concerns issues regarding transmission, there are several mTV broadcast technologies RMA (Rich Media Applications) such as: ISDB-T (Integrated Services Digital Broadcasting), DMB (Digital Media Broadcasting) and (UMTS - based) DVB – H (Digital Video Broadcasting - Handheld) (*ibid.*, 2007)<sup>11</sup>. The USA uses “Qualcomm’s” “MediaFlo” (*ibid.*, 2011). The most widely used standard is: the DVB-H (Kumar, 2007). Because it allows for the transmission of up to 30 channels (Pape & Martin, 2011)<sup>12</sup>. However, this variability of standards caused broadcasters and Telco’s (Telecommunication Company) problems due to political, corporate and economical endeavors (Schuurman, *et. al.*, 2009). Today, there’s also the possibility of network congestion (Goggin, 2011). Currently this aspect is regarded as a major flaw in a European market that consists of fundamentally 3G networks (ITU, 2010)<sup>13</sup>. Besides this issue, an uncertain TV market provided by mTV led to the reuse of previous broadcast TV contents (Goggin, 2011; Knoche & McCarthy, 2005)<sup>14</sup>. This aspect can be related to the lack of experience and this proposal summoned what can be defined as an affordable solution to answer the growing demands for MTV (*ibid.*, 2005). However, the main issue was the fact that they overlooked

11) In these proposals we can also include “MediaFlo” – a property of Qualcomm.

12) More information regarding this issue can be found in the following European Union (EU) memo – “Strategy for Mobile TV” available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/298&type=HTML&aged=0&language=EN&guiLanguage=en>.

13) Still, regarding this aspect, we can summon the fact that the current use of HSPA, LTE and HSPA+ in 3G and in the meager 4G connections (such as LTE) offer their users faster mobile data access – an aspect that enables data-intensive applications such as HD video streaming through mobile phones (Li, Dong, Ma, & Fernandes, 2012).

14) This cycle was adapted from Gartner *et. al.*, (2003) proposes the following moments – 1) “Trigger”; 2) “Peak of Inflated Expectations”; 3) “Through of Disillusionment”; 4) “Slope of Enlightenment”; 5) “Plateau of Productivity” (Linden, 2003).

a fundamental issue – understanding users’ actual behavior (Schuurman, *et. al.*, 2009).

The sum of these aspects postponed the creation of specific identity for mTV - a fundamental aspect for the success of any new media when it is trying to establish itself (Fidler, 1997; Bouwmann, *et. al.*, 2011). This aspect lead to the shattering of mTV’s hailed golden future – an aspect described by several pilot studies and trails as an enthusiastic and even utopian reality (Goggin, 2011; *ibid.*, 2010; Cui, Chipchase, & Jung, 2007; EU, 2007; Trefzger, 2005 Södergård, 2003). These traits caused markets to evolve in a very slow manner (Bouwman *et. al.*, 2009). And today, mTV is part of the enduring “bottleneck” where IPTV (Internet Protocol Television) and web transmissions stand out as the enduring modality for its transmission (Montpetit, *et. al.*, 2010). In fact, it is estimated that in 2013 there will be 83 million people using this IPTV within a worldwide basis (ITVE, 2009). So, now, mTV proposes itself as a service that enables users to transmit and receive TV contents through IP wireless networks and accessible “Cloud systems” (Lai *et. al.* 2011)<sup>15</sup>.

This content accessibility, leads to summon Gilles Deleuze’s terms and propose mTV as a part of a non-linear “assemblage” that consists of not only one access point but several (*ibid.*, 1980)<sup>16</sup>. In fact, this proposal can be witnessed when this type of TV is regarded as “emergency TV” when we cannot access

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15) By summoning this trait, we are addressing “Ubiquitous technology”. According to author Stefan Poslad, the term ubiquitous means appearing or existing everywhere. When combined with computing it forms Ubiquitous Computing (Commonly known through the term UbiCom). If we look at current Mobile Phones, it is possible to observe that they act as multiple audio-video cameras and players, as well as information appliances and game consoles. Here, interaction can be personalized and it can also be context aware by sharing personalization models in our mobile devices with other services as we interact with them (Poslad, 2009 ). Still in this perspective, we can also summon the theoretical proposal of “Cloud Computing”. This aspect can also be defined as “Cloud Storage” because it saves and provides online backup services for to be available for restoration in “on demand” perspectives. Whenever the user needs to access his contents, they are accessible through “online” synchronization (Hu, Yang, & Matthews, 2010).

16) "Assemblage" is the main thesis that underlines Gilles Deleuze and Félix Guattari’s non-linear organized essay: “A Thousand Plateaux” (*ibid.*, 1980). They talk about the metaphorical proposal “rhizome” (a bulb - which has an organic disposition without a structure made up of a traditional topology) and consider that in today’s media structures there occurs a dominance of non-structured, horizontal realities (assemblage) as opposed to classical topology organizations that were not easily accessible (*ibid.*, 1980). We consider that this aspect can be seen in today’s

traditional forms (Palmer, 2008) it is an adjacent form of TV consumption (Ahonen, 2008).

### 2.3. Context of use for mTV and preferred contents – the case of TV News

When we address MTV the specifications inherited from the reception device (the mobile phone) are fundamental (Ahonen, 2008). Thus, TV contents must be: “Flexible”, “Interactive”, “Of immediate consumption”, “Viewable on small screen devices” and ready for “Multifunctional uses” (Orgad, 2006). MTV consumption occurs in three specific realities – “home”, “job” and “public places” (Cui, *et al.*, 2007; Trefzger, 2005)<sup>17</sup>.

Content is regarded as a decisive factor for any TV proposal and mTV is no exception (Bouwman, *et al.*, 2011; Schuurman, *et al.*, 2009). Academic approaches have demonstrated that the most popular TV content is “TV News” (Jung, *et al.*, 2009; Carlsson, *et al.*, 2007; Oksman *et al.*, 2007; Knoche *et al.*, 2005). This fact is due to the nature of the genre – it consists of short and objective narratives (Machill, *et al.*, 2007; García, 1996). Besides this, this genre also upholds an historic familiarity that is easily seized by the audience (*ibid.*, 2006). However, the device specifications are fundamental. When we look at mobile phones we are talking about: “reduced screen size”, “short battery lifespan”, “glare”, “sound” and “network conditions” (*ibid.*, 2005). The sum of these elements leads mTV users to choose shorter TV programs to consume (Palmer, 2008; Knoche & Sasse, 2006). Concerning this aspect, we can summon the academic approach: “reflexivity” because it describes the fact that mTV adoption demonstrates that users adapt their choice of TV consumption to the constraints that specify the reception device (Figeac, 2009). Due to these aspects, many TV promoted specific mTV apps where TV News has an important

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TV morphology because, due to the digitization and “the Internet”, we deem that the underlying multitude of services and the emerging horizon of media networks makes TV a more accessible medium (Monpetit, *et al.*, 2011; 2010).

17) For example (e.g.) using commuter services or in waiting scenarios (such as the dentist).

role<sup>18</sup>. In a recent study, 33% of mobile TV app categories consist of TV News (Nielson, 2011). However, other hedonistic proposals are also consumed – soap-operas episodes, video clips and movies, but in a smaller degree (Knoche, 2004; Oksman, 2007; Prario, 2007; Choi *et. al.*, 2010). And what about Portugal?

#### 2.4 MTV scenario in Portugal and international trends

The Portuguese mTV market consists of the reuse of classical broadcast TV contents and meager entrepreneur proposals. However, between 2006 and 2008, two companies (the national network - RTP and Produções Fictícias) produced an experimental TV content for “mTV” – a magazine called: “Quinze” (Fifteen) – only 20 shows were produced. Later, they created a “repurposed content” called: “Hot Spot” (for MTV and Web transmissions)<sup>19 20</sup>. It also had a brief existence – only 10 episodes were produced.

In 2008, the TV company “Be Active” proposed a Web TV program called: “T2 para 3” (Flatmates) - 110 episodes were produced<sup>21</sup>. Besides this last example that consists of what can be defined as being of slight success, the previous examples describe the national mTV Market as almost non-existing. However, we must emphasize the existence of creation of specific contents.

18) For more information regarding this issue please search the following sites: CNN Mobile - <http://edition.cnn.com/mobile/mobiletv/>, <http://www.cbs.com/mobile/>, NBC Mobile - <http://www.nbcchicago.com/mobile/>; mGlobo.com - <http://gl.globo.com/>; BBC Mobile – <http://www.bbc.co.uk/mobile/i/>; Sky Mobile – <http://m.sky.com/>; RTL Mobile - <http://mobile.rtl.lu/>; ProSieben Mobile <http://www.prosieben.de/prosieben-mobile/>, TVE Móvil - <http://www.rtve.es/m/noticias/>; RTVE - <http://www.rtve.es/moviles/>; TV3 <http://www.tv3.cat/mobils/>; Tele5 [http://www.telecinco.es/masdetelecinco/Telecinco-movil\\_0\\_1472253212.html](http://www.telecinco.es/masdetelecinco/Telecinco-movil_0_1472253212.html); CuatroTV - <http://cuatro.mobi/>; Canal+ Yomvi - <http://www.plus.es/canalplusyomvi/>; La “3” Live - <http://www.la3tv.it/>; RTP Mobile - <http://www.rtp.pt/play/direto/rtpmobile/>; TVI 24 Mobile <http://m.tvi24.iol.pt/>; SIC Mobile service - <http://m.sic.pt>. Besides these examples, we can also recall that in Portugal’s mediascape we also have hybrid (with interoperability traits) mobile apps such as MEO Go - <http://www.meo.pt/ver/meogo/Pages/default.aspx> and ZONline - <http://www.zonline.pt/>.

19) More information regarding this issue can be found in the following site: - <http://videos.sapo.pt/zNBKfYfjBfNUhp7NRrWB>.

20) For more data please search the following site: <http://pftv.sapo.pt/63SDIUY7YrzsjeCcL0hM>.

21) More information regarding this issue can be found in the following site: <http://www.t2para3.sapo.pt/>.



## 2.5 Uses and Gratifications – the adoption of mTV

Most studies regarding the appropriation of mobile communication services (such as mobile phones) draw among the following intended proposals – either they identify psychological as well as sociological factors or they aim to understand the interplay of developmental factors in everyday life. Within these proposals, and in order to escape a dull dichotomy based on: “acceptance” vs. “rejection”.

Concerning the first approach, we recalled the theoretical proposals - “Quality of Service” (QoS) and the “Quality of Experience” (QoE). QoS is based on understanding the network’s performance measurements (trafficability, dependability, transmission and charging) (Iversen, 2005). On the other hand, QoE summons the comprehension of the user’s experience (through actions such as: web-browsing, TV consumption, voice and text) with a given new media service (ITU, 2007). Regarding the second proposal, it aims to understand the adoption of an innovative technology (such as mTV). The “Uses and Gratifications” (U&G) approach follows this intention because it provides a clear understanding of the adoption of any new medium (Wirth & Schramm, 2005; Ruggiero, 2000; McQuail & Windahl, 1993)<sup>22</sup>. It’s academic scope considers that audiences attempt to use these devices to fulfill psychological needs through media selection (Rubin, 1983)<sup>23</sup>. Motivations for using communication technologies are divided into “process” and “content motivations”(Stafford & Gillenson, 2004). The first measures user’s enjoyment with new media; the second relates to content consumption desires (*ibid.*, 2004). Within the U&G proposals we can witness that the QoE and QoS approaches were not overlooked; they are present

22) “Emotions are triggered by our life’s circumstances; thus, they are not automatic but voluntary”(Damásio, 1994) Neuroscientist – António Damásio – regards that emotions are based on complex patterns where psychological and neurological actions are predictable (*ibid.*, 1994). In his book: “The Self Comes to Mind” he points out that the main differences between “Emotions” and “Feelings” are that in the first case it regards an exterior representation of ourselves while the second issue occurs only in an interior level and thus we can see that it’s not public (*ibid.*, 2010). Nonetheless, fundamentally emotions are described as a complex state of the organism that involves bodily and character changes.

23) Through our theoretical review we observed that gratifications can be placed in the groups of interest – 1) Personal Identity; 2) Entertainment; 3) Information seeking; 4) Learning.

through subtle manners in perceived expectations regarding the use of media technology.

When we address Mobile TV (MTV) we must recall that it results from the convergence of several media (Broadcast Media – TV, mobile phones, Communication Possibilities – Speech Messaging and Data – ICT ) (Ahonen, 2008; Kivisaari, *et. al.*, 2005). TV through a UG scope proposes: “information seeking”, “companionship”, “entertainment”, “power to select TV programs”, “personalization”, “escapism” and the “ability to interact socially” as this medium’s fundamental trait (Rubin & Perse, 1987; Rubin, 1983; Rubin, 1982)<sup>24</sup>. Time Shifted technologies” (i.e. the VCR) propose endeavors such as: “storage”, “learning”, “social interaction” and “time shifting” (Rubin & Rubin, 1989)<sup>25</sup>.

In general, Mobile phones through a UG perspective summon: “hedonistic”, “utilitarian” and “social motivations” (McClatchey, 2006; Leung & Wei, 2000). Regarding the first proposal, this device proposes: “personal safety”, “financial incentives”, “status symbol/enhancer”, “usefulness”, “fashionable”, “entertainment”, “escapism”, “information access”, “immediacy”, “mobility”, “reassurance” and “dependency” (Choi, Kim, & McMillan, 2009; Nysveen, Pedersen, & Thorbjørnsen, 2005; Aoki & Downes, 2003; Leung & Wei, 2000). The second and third proposals summon the importance of: “interaction”, “escapism”, “friendship” and “posting” (Hanson & Haridakis, 2008; Raacke & Bonds-Raacke, 2008; C. A. Lin, 1999).

In this scope ICT proposes: “pass-time”, “information seeking”, “convenience” and “entertainment” (Lin, Salwen, & Abdulla, 2005; Papacharissi & Rubin, 2000; Lin, 1999). Being: “informed”, “entertained” and “maintaining communication” are equally important (Charney & Greenberg, 2002; *ibid.*, 1999; *ibid.*, 2000)<sup>26</sup>. Additional studies pointed out motivations such as: “social

24) Regarding this medium, two traits are proposed – 1) Structural – that considers that TV is an Environmental medium (companionship, entertainment when an individual is lonely) and Regulative one - (punctuates time and activity); 2) Relational – facilitates communication processes (serves as common-ground), can serve as an avoidance and endures social learning (Behaviour Modeling) and promotes Competence (role enhancement) (Lull, 1990).

25) When think of the importance that pull technologies have in mobile phones as access points, we can understand why quoting this proposal is important.

26) E.g. movie and video-clips watching and game-play (*ibid.*, 1999).

escapism”, “security”, “privacy”, “information”, “interactive control” and “socialization” (Korgaonkar & Wolin, 2002; Korgaonkar & Wolin, 1999).

Mobile TV in UG studies proposed the importance of: “entertainment”, “social interaction” and “permanent access needs” (Lee, *et. al.*, 2010a; Lee, *et. al.*, 2010b; Choi, *et. al.*, 2009; Kwon, *et. al.*, 2000). In addition, “convenience”, “efficiency”, “immediacy”, “ease of use”, “speed”, “productivity”, “fashion”, “mobility”, “portability”, “social status”, and “social interaction” were also considered important gratification factors (Lee, *et. al.*, 2010a; Lee, *et. al.*, 2010b; Choi, *et. al.*, 2009; Stafford, *et. al.*, 2004). In what concerns “TV News”, UG approaches showed the importance of: “instrumental use”, “excitement seeking” and “information gratifications” (Rubin & Perse, 1987).

## 2.6 Why study college students?

Traditionally, this undergraduate age group is the one that better accepts new media trends (Lee, Ryu, & Kim, 2010; Choi, *et. al.*, 2009; Kaasinen *et. al.*, 2009; Leung, 2007; Lin, *et. al.*, 2005; Ito, *et. al.*, 2006; Rice & Katz, 2003; Lin, 2001; Ling, 2000). College and University students also show the highest rate of ICT use (Lee, *et. al.*, 2011; Choi, *et. al.*, 2009).

The historical explanation of these tendencies can be traced to Everett Roger’s “Diffusion of Innovations” theory (*ibid.*, 1995)<sup>27</sup>. According to Rogers, when faced with new technology, the decision to adopt it follows these moments: 1) “Knowledge”, 2) “Persuasion”, 3) “Decision”, 4) “Implementation” and 5) “Conformation” (*ibid.*, 1986)<sup>28</sup>. Rogers also categorized this process through age-groups where students, due to their traits, are “innovators” and “early

27) Coined in 1985, this proposal explains the causes and speed that defines the stretch of technological innovations through cultures (Rogers, 1995; *ibid.*, 1986).

28) In a more detailed perspective, we can see that the adoption of new technologies endures in the following process: 1) Innovation – an idea, practice, or object that is perceived as new by a person that is adopting this novelty; 2) Communication Channels – the way by which messages are transmitted from one individual to another; 3) Time – it recalls the decision making process – the length of time that it takes to pass from through innovation to acceptance and posterior usage; 4) Social System – set of interrelated units that are engaged in joint problem solving to accomplish a common goal (*ibid.*, 1995).

adopters” (*ibid.*, 1986; *ibid.*, 1995). Based on (*ibid.*, 1986; 1995)<sup>29</sup>. A similar view, applied to the adoption of mobile phone and mobile applications, proposes that these users are part of the “Mobile Generation” (18-24 years of age) and of the “Telefanatics” (18-34 years of age) (LSE, 2006)<sup>30</sup>. Recently, because of the use of “social networks”, college students represent a transition to adoption segments that are defined as “moberati” and “social connectors” (Experian, 2011)<sup>31</sup>. Based on these proposals regarding technology adoption trends, we can summon the “Two – Step Flow of Communication” theory and state that this age group’s acceptance rate provides it with enough expertise to present them as “opinion leaders” that can exert personal influence to other people when it comes to adopting new media (Katz, 2006; *ibid.*, 1957)<sup>32</sup>.

If we take a look at this issue in figures, we can see that in 2009, 77% of North American young adults (22 – 24 years of age) owned a mobile phone in

29) “Innovators” – are the first people to adopt an innovation. They are young in age and are willing to take risks – this tolerance has them adopting innovative technologies without any fear of failure; “Early Adopters” – they are regarded as the second fastest group who adopt innovative technologies. These people can be specified by the highest degree of opinion leadership among other adoption categories. Typically they are young people with a high social status; “Early Majority” – people in this phase adopt an innovation after some time. These individuals have a tendency to be slower in this process. The social status of these individuals is above average and they contact with early adopters and hold opinion leadership positions in a seldom manner; “Late Majority” – technological adoption is later rather than earlier and they are more skeptical. They are characterized through a low income reality and social status; “Laggards” – these individuals are the last to adopt technological novelties. They can be characterized by minute opinion leadership, aversion to change and are advanced in age.

30) Besides these proposals we can see that there also exist other degrees of adopters: “Useful Parents” (parents that are between 18 and 34 years of age), “Smart Connected” (25-44 Parents and active workers), “Thumb Culture” (Mobile Phones are a mirage) and “Silver disbeliever” (senior citizens).

31) According to the Experian – The 2011 Mobile Consumer Report, “Moberati” – represent the mobile generation that has grown up with these devices and just cannot imagine their lives without them (*ibid.*, 2011). The same thing occurs with “Social Connectors” where their mobile phone is the bridge to their social world; “Pragmatic Adopters”, on the other hand, describe the generation of users that started to use mobile phones later in their lives for basic technologically mediated social behaviors – like: “saying hello” (*ibid.*, 2011).

32) To investigate this issue, particular attention was paid to people who, for example, changed their votes in an election process because of other people (Katz, 2006). Furthermore, this aspect implied that there were people that exerted great influence on the intentions of other people. These “opinion leaders” lead to the creation of the “Two step flow” theory that proposes that: ideas often seem to flow from the mass media; however, in smaller groups it is other people that take them to these less active sections of the population (*ibid.*, 2006).

2011, 98%. In Portugal, the same thing occurs currently 98.5% (15 – 24 years of age) also owned one (Cardoso, *et. al.*, 2012). In fact, all this data leads to conclude that: the younger the group the bigger the potential of mobile phone penetration. Based on all this data, we will attempt to profile the mTV adoption rates and expectancies regarding this TV consumption possibility.

## 2.7. Method, data analysis and Discussion

### 2.7.1 Method

A total of 630 university undergraduate students in Universities and Colleges in Portugal was voluntarily surveyed between October of 2011 and May of 2012. The survey consisted of evaluating demographic issues, current uses of TV and the use mobile phone for media consumption specifying TV.

The inquired sample was recruited from several higher education universities, colleges and degrees (ESEC, ISEC, ISCAC, ESTeSC, UBI and ISMT)<sup>33</sup>. In order to control variance of the data introduced by the questionnaire and the procedure, we followed a set of recommendations based on Pestana & Gageiro (2000). Our sample consisted of – 45.7% (288) male respondents and 54.3% (342) female respondents.

### 2.7.2 Data Analyses and Discussion of the obtained results

The respondents were experienced mobile phone users – 72.8% (458) stated that they used the mobile phone since they were aged between 10 and 15 years

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33) ESEC (Coimbra College of Education) – Communication Design and Multimedia, Elementary Education, Sport and Leisure, Media Studies, Organizational Media, Music, Tourism, Social Gerontology, Arte and Design ISCAC (Coimbra Institute of Accounting and Administration) – Corporate Management, Accounting and Administration, ISEC (Coimbra Institute of Engineering) – Biological Engineering, Civil Engineering, IT Engineer, ESTsC (Coimbra College of Health Technology) – Physiotherapy, Pharmacy, UBI (Beira Interior University) Medicine, ISMT (Miguel Torga Higher Education Institute Coimbra) – Multimedia and Psychology.

of age. This aspect can also be seen regarding TV consumption because 90.3% (566) stated that they have a TV at home – of these 54.7% (343) has one in their bedroom and 49.9% (307) declared that they consumed between 2 and 5 hours of TV every day. Regarding integrated TV services - 72.5% declared they used IPTV and 32.7% said they subscribed these services at least one year ago. Of the sample 71.7% stated that they didn't subscribe "premium channels" and 79.6% declared that they did not rent movies through VoD<sup>34</sup>. Yet 59.3% said they recorded TV content on their STB to watch later<sup>35</sup>.

Among the participants, 52.7% stated that they did not consume Web TV. However, 71.7% declared that they watched TV through streaming and 49.8% did it for at least one hour per day and 94.3% used their computers. Regarding the consumed genre through this access point, 12.4% declared that they consumed "TV News", "Sports", "Movies" and "TV Series"; 11.5% stated that "TV News" was preferable. These tendencies demonstrate that mobile phone and television uses start at an early age (Cardoso, 2012; Cardoso *et. al.*, 2012). Broadcast TV still presents itself as the most relevant access form. However, a wider and more personal variety of TV consumption forms are surfacing. Through these results we can see that Portugal follows a worldwide tendency (Nielson, 2011). The preferred short narratives through streaming distribution are also current trends in other studies (Nielson, 2012; Noam, Groebel, & Gerbarg, 2004).

Concerning the use of mobile phones for media consumption, 56.0% stated that they did not have a Smartphone; 62.8% have no data subscription and 66.6% don't access data. Nevertheless, 63.0% declared that they watched "video content", 79.1% considered this service useful; 34.6% regard "music video clips" as the most interesting genre and 22.6% argued that it was "TV News". The preferred access form is downloading - "pull technology" (57.6%).

Regarding Mobile TV (mTV) – 79.7% said they never consumed it. From the 20.6% that used it, 76.5% declared that used it only once as an experiment. The mobile phone is not suitable for mTV by 80.6% of the inquired sample. The major issues reside for this result reside in the small screen size (23.2%), meager image and sound quality (16.2%). However, besides these aspects, 54.2%

34) VoD – "Video On Demand".

35) STB - Set – Top – Boxes.

consider “streaming” the most adequate form of mTV consumption. In fact, the preferred genres are “TV News” (27.2%) and “Musical Video Clips” (13.7%).

These results propose that “Smartphone” penetration and data subscription are still scanty realities. If we compare this data with countries such as the USA - where 66% of this age group currently owns a Smartphone; England (39%) , Spain (44%) and Italy (29%) we can see that our percentage is still small (Google, 2012; Ofcom, 2012; Pew, 2012). However, Portuguese higher education students’ tendencies follow traits that can be seen in other studies (Cui, et al., 2007; O’Hara, Mitchell, & Vorbau, 2007; Repo, Hyvonen, Pantzar, & Timonen, 2004). As what occurs in other investigations, they also considered that “screen size” and “sound” are major issues in mTV (Schuurman, 2009; Knoche & McCarthy, 2005). In fact, these aspects are the most prevalent issues regarding mTV adoption (Kumar, 2007). Preferred access forms (streaming) and genre (TV News) are similar to countries such as South Korea (Choi, et al., 2009; Cui, et al., 2007), Finland (Oksman et. al. , 2007) Germany (Trefzger, 2005) and USA (Choi, 2010).

In what concerns the proposal if individualized TV consumption can influence in a positive manner the sample’s perspective regarding mTV, we used a correlation table between all the surveyed dimensions and pointed out the reliability between the independent variables – “information”, entertainment and their correlation with “attractivity”<sup>36</sup>.

The multi-item scale’s reliability were all good or acceptable. It’s possible to verify that “attractivity” is positively and meaningfully correlated with “information” ( $r = .444$ ) and “entertainment” ( $r = .423$ ). Being this last variable one of the most significant elements, these results provide positive support for the proposed hypothesis – that individualized TV consumption tendencies influence in a positive manner the perspective regarding the possibility of consuming TV through mobile phones that we inquired in beginning of this paper.

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36) We selected these dimensions because they represent the bedrock of the studied medium – TV (D. McQuail, 2000).

**Table 01 - Descriptive statistic and Correlations**

	1	2	3	4	5	6	7	8
1. Social Interaction	(.82)							
2. Information	.379**	(.79)						
3. Entertainment	.438**	.417**	(.82)					
4. Fashion	.281**	.115**	.181**	(.84)				
5. Mobility	.421**	.495**	.431**	.268**	(.74)			
6. Immediacy	.478**	.504**	.425**	.223**	.533**	(.74)		
7. Attractivity	.460**	.444**	.423**	.152**	.409**	.485**		
8. Sense of Security	.434**	.268**	.315**	.282**	.232**	.400**	.354**	(.66)

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Alpha Cronbach - ()

In fact, through a closer observation, in this table, we can see that “attractivity” is correlated with all the variables and other meaningful variables are “social interaction” ( $r = .460$ ) and “immediacy” ( $r = .485$ ). This relates our sample’s expectancies regarding mTV to social behaviors e.g. using social networks to promote their TV preferences and immediate access to content. However, we will address this aspect in future investigations.

## Conclusion

In Portugal higher education students’ use of mobile technologies to access media is growing. Data demonstrated that they have consumed broadcast TV for a long time. However, as what occurs in other countries, such as the USA, unconstrained “Time Shifted Technologies” (such as IPTV and the Internet) are regarded as TV viewing trends on a regular basis by this age group.

This study showed that “Smartphone” adoption is still scarce but it proposed the mobile phone as an established mainstream reality. However, a discontinuous paradigm was verified in what concerns the adoption of Mobile



TV. Issues related to the “Quality of Experience” and of the “Quality of the Service” (screen size and the quality of sound) were the proposed problems. In what concerns genre - “short contents” (such as TV News and Video Clips) were regarded the most adequate for mTV consumption. A common trademark that Portuguese undergraduate students share with other studies. We also observed that individualized TV consumption tendencies are historic, in this age group, and this aspect influences positively perspectives regarding the possibility of consuming TV through connected devices – such as the mobile phone. This study also proposes that there occurs a desire for personalizing the TV experience through downloading. “Freemium” models are desired to access “the Internet” (through “Hot Spots”) and content. As what occurs in other countries, nobody wants to pay for access to “the Web” and contents to be consumed over their mobile phone.

Based on these findings and by summoning John Erdal’s argument of the existence of an historic need for a specific identity that are proposed when a new media attempts to establish itself (ibid., 2007). We consider that Portuguese media corporate conglomerates – made up of Telco’s (Telecommunication companies) and mobile phone corporations can play a major role in this issue. They must overlook the current simple reuse of broadcast TV contents that currently makes up Portuguese mTV grids. And propose alternatives that better fit the desires proposed by the people that own and use mobile phones to watch TV contents. By gratifying these proposed motivational needs, they will eventually propose a more specific model of mTV with its own identity for our national market...

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