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Open Innovation during Web Surfing: Topics of Interest and Rejection by Latin American College Students

José Gómez-Galán [1,2,*], José Ángel Martínez-López [3], Cristina Lázaro-Pérez [4] and José Carlos García-Cabrero [5]

1 Department of Education, University of Extremadura, Avda. de Elvas, s/n, 06006 Badajoz, Spain
2 Cupey Campus, Ana G. Méndez University, San Juan, PR 00926, USA
3 Department of Social Work and Social Services, University of Murcia, Avda. Teniente Flomesta, 5, 30003 Murcia, Spain; jaml@um.es
4 Department of Sociology, University of Murcia, C/Campus Universitario, 11, 30100 Murcia, Spain; cristina.lazaro2@um.es
5 Faculty of Philology, National Distance Education University (UNED), Paseo de la Senda del Rey, 7, 28040 Madrid, Spain; jcgarcia@flog.uned.es
* Correspondence: jogomez@uagm.edu

Abstract: The university is currently involved in complex processes of open innovation through permanent dialogue with institutions and companies in the economic, social, and political fields. Professors, researchers, students, and other members of the institution take part in these processes. This is a phenomenon that has emerged in today's network society due to digitalization and globalization. It is therefore essential, in this context of open innovation, to know the behaviors, habits, consumption, or lifestyles of university staff and students to achieve, in the best and most effective way, integration of higher education in this new reality. How we interact and communicate with the surrounding people has transformed with wider access to the Internet and the development of information and communication technologies (ICTs), especially through smartphones and the use of apps and social networks (WhatsApp, Twitter, Facebook, etc.). This digital revolution has reconfigured our interests, dispositions, and social participation. From the university field, knowing the interests of students who access the Internet is of vital importance to guide teaching methodologies, adapt content, facilitate communication processes, develop digital literacy practices, etc. The present research, focused on the Latin American sociocultural space, has a double objective: (GO1) to know which are the issues of most interest and consumption for university students; (GO2) to determine which issues they reject while they surf on the Internet. A quantitative research has been developed (n = 2482) based on the validated questionnaire COBADI®. The topics of greatest interest to the Latin American university students were, in this order: "use of social networks", "news", "music", "education", "work", and "videos". The fact that they put education in fourth place, as students, shows that it is not a high priority in their use of the network. On the opposite side, those that show more rejection are "celebrity journalism", "online games", and "pornography". Among their topics of rejection is also "politics", which is not prioritized by university students. These topics have been presented in different proportions according to the country analyzed, depending on their specific social and political circumstances, and have experienced a different evolution from 2012 to 2019—the time covered by the study.

Keywords: topics; interactions; web surfing; communication; open innovation; higher education; student university

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1. Introduction

The university is one of the institutions with the greatest traditions. The first one, created in Bologna (Italy), dates back to 1089, although it was not until the 14th century that it was recognized as a university. A little later, in 1096, the University of Oxford (England)

was born. During the 12th and 13th centuries, during the Middle Ages, the European continent began to be populated by more universities: Toulouse and Paris (France); Padua and Modena (Italy); Palencia, Salamanca, and Valladolid (Spain); Coimbra (Portugal); among others [1]. Although they have spread from Western Europe throughout the world until today, it was initially a closed system reduced to specific social circles. Though it led to much of the scientific activity and technological progress, its relations with other institutions and organizations were for a long time not very fluid.

Today's university, however, far from being a closed system, is gradually becoming more open to society. At present, it is not only an indissoluble part of it, but it is also in permanent dialogue with other institutions in the economic, social, political, and cultural spheres. Moreover, the emergence of information and communication technologies (ICTs), which are giving rise to a digital revolution that is transforming the foundations of society [2,3], have made the university one of the main engines of change and innovation in this new reality [4,5]. Its link with society, and its leading role in innovation, are closer than ever.

The phenomenon of digitalization, together with that of globalization, have broken down the physical boundaries in such a way that the university is now in a process of transformation, taking its academic and scientific activities into the virtual spaces generated by the network society [6,7]. In this context, the university institution, just as it does in the different economic, business, social, etc. contexts, is immersed in a transformation towards open innovation models, in such a way that they allow it to adapt to the current needs arising from this new paradigm that constitute digitalization and globalization.

Today, the university is establishing continuous processes of innovation, exchange, and collaboration with companies, social institutions, international organizations, and further, which are taking shape in various forms of certified cooperation in alliances, research chairs with universities, competitions through crowdsourcing, and innovation ecosystems [8–12]. Professors, scientists, staff, students, etc., are participating in these activities [13–18].

The impact that this network society has on members of university institutions is much less studied. There is abundant scientific literature on the processes of open innovation in higher education, but there are not so many studies that analyze the behaviors, habits, consumption, or lifestyles of university staff and students. This knowledge is fundamental to effectively carry out processes of transformation that convert the university into a means of formation in accordance with the needs of this new society and, in parallel, its complete integration into it [19]. For example, knowing the habits of students in their use of the Internet and social networks is crucial to carry out effective policies for the integration of ICT into the educational processes of Higher Education [20]. In a context of open innovation, all knowledge of the relationships that exist today, both from a personal and professional perspective, of citizens in the digital society allow us to adapt and adjust the projects developed for this purpose.

It is necessary to keep in mind that one of the basic characteristics of human beings, and the main protagonist of the social transformations that have occurred with digitalization and globalization, is communicative processes [21]. This function develops from many forms and contexts and can express any interest, emotion, thought, etc. [22]. The Internet has created a new field of communication with its schemes, protocols, and methods using various digital technologies [23,24], which are in constant metamorphosis.

Digitalization brings a new and broad framework of communication and interaction between human beings: Regular contacts with acquaintances, entertainment, labor coordination, procedure management with public administrations (saving time and streamlining them), etc. The new digital paradigm reflects a scenario of multifunctionality in the face of a wide range of possibilities. Since its emergence until today, citizens have also reconfigured new habits and uses of time, mainly due to mass access to smartphones in recent years.

The health crisis resulting from the COVID-19 pandemic has shown that both the Internet and digital electronic devices are a key tool in communication processes, especially

through work, educational, and leisure videoconferences. Specifically, in the field of work, it has facilitated autonomous work and teleworking, a dynamic that appears to have arrived to incorporate novel forms of work organization [25].

Beyond the work environment, one can see how the written language of websites has nothing to do with traditional formal language. In this context, sentences are traditionally constructed from signs, abbreviations, acronyms, and, above all, computer graphics and emojis [26]. The new communication platforms have reconfigured how we communicate, both in their content and in their formal aspects. A simple example of this is Instagram, WhatsApp, or TikTok.

Higher education students have fully integrated these alternative forms of communication and take part regularly in web platforms. For years, higher education institutions have been incorporating the digital contents of their teaching platforms to the online training perspective through videoconferences, digital classes, virtual tutorials, etc. [27]. Undoubtedly, this is the way forward given the ease and speed of communication; immediacy of information; and access to electronic training resources, from articles to graphic presentations. We face a new educational paradigm that requires analysis and discussion of the role that ICTs play in higher education because of the technological revolution that is affecting all social spaces, with the educational field being one of them [28–31].

Interpreting the different creations, access, and participation within ICTs allows us to understand the meanings they generate, regardless of how they are expressed, either from a news item, video, commentary, or image. From the perspective of higher education, if the digital character is going to be merged in the formative processes, knowing the interests and habits of students is of vital importance to promote correct media literacy [32].

2. Background

Since the emergence and massive extension of the Internet, it has been configured as an exceptional space for access to information from anywhere in the world and any time of day, favoring immediacy in all processes. Due to the transformation of society in the new millennium, the traditional concept of the global village now characterizes the life of humans in our era [33]. By age, young people around the world are increasingly using the Internet as their preferred means of accessing information [34,35]. Despite this, Internet access and consumption is reaching more age groups, narrowing the digital divide that existed a few years ago [36].

Inspecting Internet usage data, we see the following statistics: (a) a mobile device is used to perform more than half of the searches made on Google (61%); (b) mobile applications take up 90% of the time spent on these devices; (c) 2.5 billion people currently shop online; (d) social media today has 3.8 billion users; (e) the average time consumers use apps, messaging, and social media is 2 h and 24 min a day; (f) almost 100% of people aged 18–29 today use mobile apps [37]. Internet consumption is very varied, but some activities concentrate on the highest use. According to Lidefer [38], the most daily habits related to websites are as follows: (1) Information search, (2) Instant communication, (3) Contact with social networks, (4) Research, and (5) Education.

Young people are the age group that use the Internet the most, and in turn, the one that does so from a more heterogeneous perspective, from entertainment to the search for information including video games, social networks, and academic training [39,40]. Despite the possibilities offered by ICTs in the academic field, young people today use the Internet basically to establish social relationships, entertainment, and for different hobbies, far beyond the search for information [41]. The extension of the Internet to the entire population, besides reducing the digital divide among age groups, is also reaching disadvantaged environments where social conditions are a barrier to equal participation in digital platforms, although not at a pace that would be desirable, especially in certain countries [42].

We cannot ignore the role of family and social origin in the use of web browsing, which continues to be a determining factor in the reproduction of social inequalities [43]. This is a

phenomenon that has become especially clear in the current health crisis resulting from COVID-19 [44], despite being in the research and educational agenda for decades [45–48].

Websites and apps oriented to the improvement of learning are increasing all over the world, especially in higher education through different tools such as support videoconferences, self-assessment tests, forums, and shared workspaces. Certain studies show how the use of emerging ICTs, such as augmented and/or virtual reality apps, are part of the new teaching methodologies; however, issues related to student support, safety, equity, or privacy need to be addressed further [49,50]. These are complex problems that sometimes require the study of multiple variables, in which many emerging technologies are present that combine within the teaching–learning processes [51].

ICTs are making their way into higher education by providing services, adapting content, and generating alternatives to different student contexts. This situation is especially visible in the cases of nontraditional teachings, such as adult schools or universities, whose preferred students are usually adults who combine work and study [52,53]. We have already stressed that the COVID-19 pandemic has highlighted the importance of ICTs in sustaining minimum quality standards in educational institutions, maintaining teacher–student interaction, and generating new learning methodologies [54–58]. It is necessary to integrate them efficiently and effectively.

This is because on the Internet, not everything is positive. Without going any further, the daily use of social networks by young people can have harmful effects, such as addictions to social networks, as some research shows [59–61]. This is a serious problem that is being addressed by educational institutions due to the potential health implications for individuals [62–64].

All the potential dangers on the Internet are contributing to an increase in the rejection of this form of information and communication, especially in some areas such as social networks and online shopping due to the insecurity it can present for users [65]. The same applies to the feeling of vulnerability both in terms of personal data protection and computer equipment [66–68].

The same goes for the quality of the information and content present on the network itself, which is extremely uneven. Any Internet user can access high-quality information, but they may also discover other information that lacks quality or validity completely; therein lies the problem that it is sometimes difficult to discern. Sometimes, the information offered is dangerous, despite apparently being presented as useful or relevant. Hence, the importance of digital literacy is referred to.

Without going into all the problems generated today by fake news and disinformation, in all fields (economic, social, political, etc.), we can take as an example the field of health care and personal welfare. Many websites focus on this aspect whose contents may not be rigorous. There are many cases of some aimed at weight loss, calorie control, etc. [69]. The problem is even greater in the case of people suffering from serious diseases. On many occasions, they tend to access the Internet to obtain information and even make decisions about their treatments, which can have serious repercussions for their health [70,71].

Although there is gradually a greater awareness of the role that certain websites and applications play in personal well-being, and governments exercise greater control over what type of information is offered from the Internet [72], there is still much progress to be made in this area. It is one area in which digital literacy of the population is most needed [73,74], with the due control and supervision of competent entities.

As we see, the ways that users access the Internet and the characteristics of their consumption are determining factors in deciding in the social, economic, educational areas, etc. Therefore, it is essential to investigate these factors in higher education students. This information can be decisive for educational policies to be undertaken. In our research, we carried out an investigation in the Latin American sociocultural space. Due to their cultural and idiosyncratic characteristics, it is crucial to know the interests and rejection that this group shows when they use the Internet, to determine which are the themes that most attract them, and which are those that do not awaken their interest or even reject them.

This information is useful to face a decisive digital literacy in higher education, and in a world like the present one in which the processes of virtualization and digitalization of teaching are more and more necessary.

3. Materials and Methods

3.1. Objectives

The approach to the habits, uses, and consumption of ICT is vital to know the interests of the subjects who access the Internet. This research aims to get a general description of these interests to establish didactic proposals, adapt contents, facilitate the connection with students, etc., through the educational institutions. Further, information is offered in a wide temporal space, which practically occupies a decade, so that the interests of consumption and use of the Internet and its evolution can be determined precisely.

In this sense, we have two major objectives: (GO1) to know which are the topics of greater interest and consumption for Latin American university students; (GO2) determine the topics that students reject or will not dedicate their time to while surfing the Internet. All this is within the knowledge's context of consumption and habits that this group presents and, also, its implications in the educational and formative processes present in the university world.

3.2. Study Design

3.2.1. Instrument and Sample

The present study shows the results corresponding to the research questions "What topics are you interested in seeing and consuming on the Internet?" and "What topics would you not waste your time consuming on the Internet?" analyzed by annual time cohorts and based on text mining analysis.

Descriptive and exploratory analyses based on text mining are offered to evaluate variation in the topics of interest or rejection when surfing the web, based on the open responses of the interviewees in the framework of a survey carried out during the period of 2012–2019 in Latin American countries.

The instrument used was the questionnaire COBADI® (Digital Basic Competencies 2.0 of University Students), registered trademark in Spain with number 2970648. This questionnaire was created, tested, and validated by researchers of the research group EduInnovagogía® (HUM-971), including the authors of this research, then implemented and applied through an online access platform. This questionnaire is composed of 23 items that are distributed in three categories: (i) "Skills for the search and treatment of information through the use of ICT"; (ii) "Interpersonal skills in using ICT in university settings"; and (iii) "Tools of social and virtual communication of the University". This last category includes questions about students' use of the Internet, including topics of greater or lesser interest in their web browsing, which is the object of our study.

The COBADI® instrument was created in the framework of a project in which researchers from the University of Alicante, the University of Valencia, and the University Pablo Olavide of Seville participated. The fundamental objective of its design was to take advantage of and optimize the digital resources in the classroom based on the knowledge of the level of digital competence of the students [75]. It followed a similar approach to a previous instrument called INCOTIC [76], with issues related to the general use of the Internet and ICT for communication, collaboration, search and handling of information, as well as including specific sections on the role played by ICT in the university. This instrument was used for the first time in 2012 to carry out a study with students from the University of Alicante [77].

The reliability of the questionnaire was determined (Cronbach's $\alpha = 0.90$, $\omega = 0.75$), which, according to the George and Mallery scale [78], implies a high score. It is, therefore, a very consistent instrument from a scientific perspective. In terms of validity and reliability, the results have always been excellent, both in Spain [75] and its adaptations in different Latin American countries [79–81]. In this context, it has been widely used in

multiple studies for different objectives, all of them in relation to the competence, use, and consumption of ICT by students in higher education [82–85].

Therefore, this article presents the data analyzed on this topic in one third of the referred categories. A questionnaire was distributed, through digital means, in several Latin American countries over seven academic years (specifically from 2012/2013 to 2018/2019). We had the collaboration of university professors who offered their students the link to the instrument (COBADI®), with which they could easily access and the answer the questions asked. The two questions analyzed were "What topics are you interested in seeing and consuming on the Internet?" and "What topics would you not waste your time consuming on the Internet?". These are open-ended questions where respondents include the topics of greatest interest or rejection when they web surfing.

The analyses were conducted on a comparative basis by year to assess the change in the most named words by respondents over time. A dataset containing the full number of observations made in this large set of countries was used, allowing for a large sample (n = 2482) over time. The dataset contains complete responses for both COBADI® survey variables for all respondents. The database was filtered to include in the analysis only countries that included more than 80 respondents, leaving the following countries: Spain, Mexico, Guatemala, Ecuador, Chile, Peru, and Venezuela. To deepen the search for information and the application of tests, such as the search for trends over time, the countries with larger samples were selected, in our case, Mexico, Venezuela, and Spain.

The requirements of the university ethics committees were followed at all times in the application of the questionnaire and throughout the research process. The Codes of Good Practices for Human Research were signed, and participants were provided informed consent in accordance with the Declaration of Helsinki. The research team registered and signed the project according to all the fulfilled requirements.

3.2.2. Methodological Process of Data Mining

The dataset contained the complete responses for the variables/object of our study (Topics of Interest/Topics of Rejection) of all respondents of the COBADI survey (n = 2482). Therefore, the first step was to filter the database to keep in the analysis only countries that collected more than 80 respondents.

```
# Libraries used for the execution of the analyses
library(tidyverse)
library(lubridate)
library(gplots)
library(tidytext)
```

The analysis was performed separately for each of the variables (Topics of Interest or Topics of Rejection). The *tidytext* package was used to separate each respondent's answers by words or by pairs of words that represented an interesting term to count (a process called *tokenization*). The tokenization had several phases, which were developed as follows:

A. First phase, responses of the respondents were taken and separated into individual words, always identified with the country of the corresponding respondent. A filter was applied to eliminate words in the Spanish language that are of little interest for this type of analysis; for example, connectives and generic terms such as "something" or "some" (called *stop words*).

B. Second phase, a count of bigrams was made in the same context as in the first phase, i.e., pairs of words. Most of the bigrams are not necessarily interesting. Only 5 bigrams of particular interest were selected for our analysis.

```
bigrams <- c("social networks", "celebrity journalism", "match making", "social issues", "virtual classroom")
```

C. Third phase, the data tables were joined with the tokens by word and by bigram grouped by country.

D. Fourth phase, new stop words that did not offer relevant information were eliminated, and words that are now only being considered within bigrams were removed. For example, "networks" and "social" ceased to exist as separate tokens and now only exist as the term (token) "social networks".

```
nowords <- c("make", "theme", "topics", "any", "some", "yellow", "search", "networks", "social",
"watch", "programs", "online", "related")
```

E. Fifth phase, there was a homogenization of terms that were varying because of regionalisms or variations in expression, but that finally referred to a particular concept. The idea is to quantify only the concept to which the respondent refers and not necessarily the exact words he or she used. For example, the term "celebrity journalism" was chosen to replace any similar terms such as "yellow press", "show business", and "gossip". The term "celebrity journalism" was selected in this sense, given that this term is the most common.

```
# Code exemplifying the substitutions made. I end to the right of '<-' substitutes those that appear
within the parenthesis.
term <- as.character(vector())
term [c("yellow press", "bluff", "gossip", "showbiz", "celebrities")] <- "celebrity journalism"
term [c("play", "video game", "video games", "games")] <- "games"
term [c("academy", "scholar", "academic")] <- "academy
term [c("work", "jobs")] <- "work"
term [c("university", "college", "campus")] <- "university"
term [c("facebook", "twitter", "instagram", "tuenti", "tumblr", "social networks")] <- "social
networks"
term [c("wagons", "bicycles", "cars", "vehicles")] <- "vehicles"
term [c("sport", "basket", "football", "soccer")] <- "sports"
term [c("movies", "films", "pictures")] <- "films"
term [c("chat", "chats")] <- "chat"
term [c("entertainment", "entertaining")] <- "entertainment"
term [c("tele", "tv", "series", "novels")] <- "tv"
term [c("youtube", "youtubers", "video", "videos")] <- "videos"
```

F. Sixth phase, we grouped by year and country and counted the number of times a token was expressed by respondents, both by year and by country. This was done to make comparisons in the variation of interests over time for each country selected in the analysis. Transformations were made to express this frequency in percentages.

For the whole process we used the R software, a very flexible programming environment, and formed by a set of tools that, through packages, libraries, or defining the functions, can be adapted to the needs of virtually any statistical analysis required. It has the advantage of being a free software environment (GNU GPL license) and interpreted programming language. In short, it allows great versatility, both in analysis and data visualization capabilities.

4. Results

4.1. Terms of Interest or Rejection Per Year

The following are the results, and their corresponding graphs to make them more accessible, representing the 10 most common terms expressed in the survey for each of the years of the study. The first graph (Figure 1) represents the activities of interest, while the second graph (Figure 2) represents the activities that respondents reject.

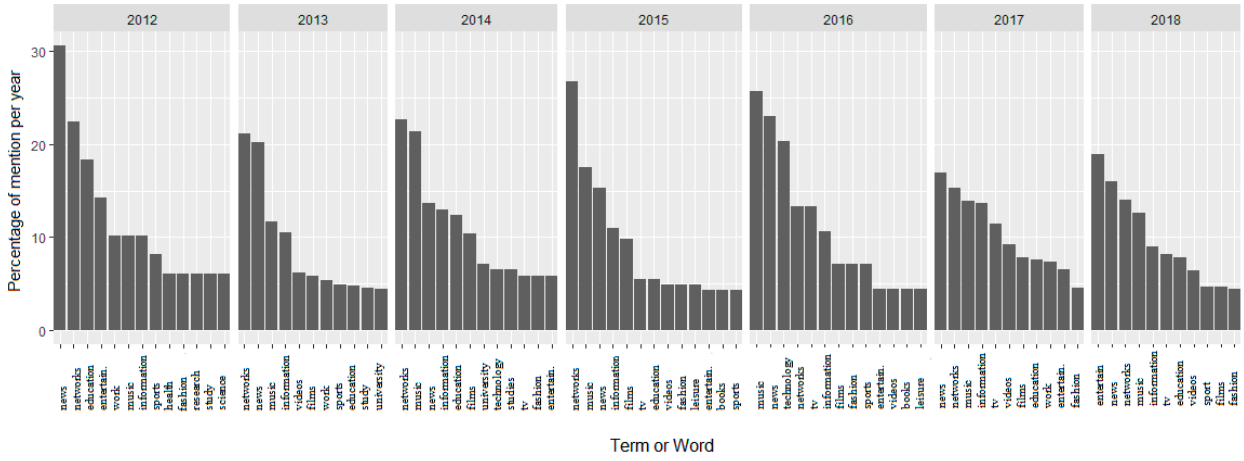

Figure 1. Frequency of mention of the word or related terms (per year) in response to the following question: What topics are you interested in seeing and consuming on the Internet?

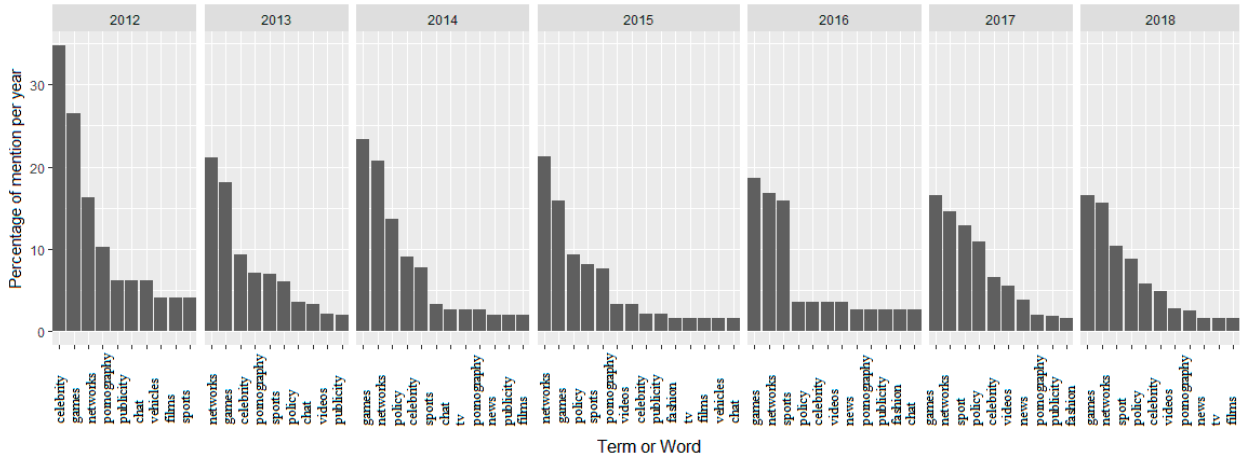

Figure 2. Frequency of mention of the word or related terms (per year) in response to the following question: What topics would not occupy your time in your use and consumption of the Internet?

It is notable that, over the years, the two terms of interest most expressed by respondents refer to the use of social networks and news. Other terms highly represented in the survey over the years refer to "music", "education", "work", "videos", and "movies" as tokens of interest.

Among the issues that respondents express rejection of (when using the Internet), the most recurrent terms over the years refer to "celebrity journalism", "online gaming", "pornography", and "politics". It should not be overlooked that a high percentage of students surveyed also indicate that they would not use their time on the Internet for social networking; in this sense, it can be determined that, as for society in general, there are both supporters and detractors of these new media.

4.2. Variation of the 10 Most Common Terms over Time

The following chart shows the 10 most common terms expressed by respondents as topics of interest when using the Internet (Figure 3). It is remarkable that "news", "social networks", and "music" are the most represented topics. This exploratory analysis does not seem to show a trend of increasing or decreasing use of the Internet for particular purposes over time.

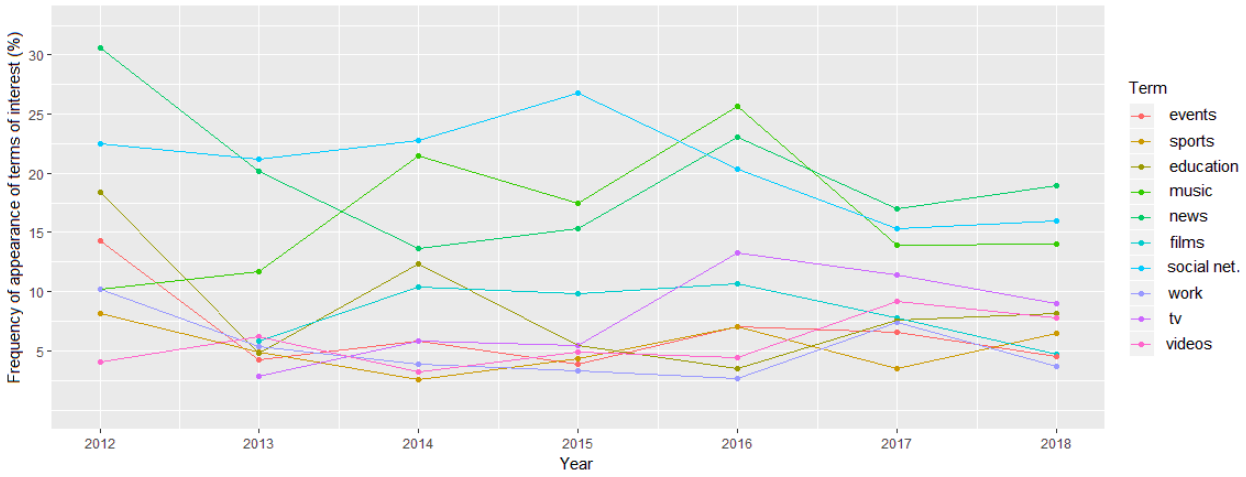

Figure 3. Annual variation of the 10 most common terms named by respondents as topics of interest for web surfing.

The line graph below is shown to evaluate the variation in time of the activities rejected by the respondents (Figure 4). In this case, the two most common terms are "games" and "social networks", indicating that most respondents consider these activities a waste of time on the Internet. However, there seems to be a decrease in rejection rates for these activities in recent years. Sports and politics are also topics that a significant proportion of respondents reject when using the web.

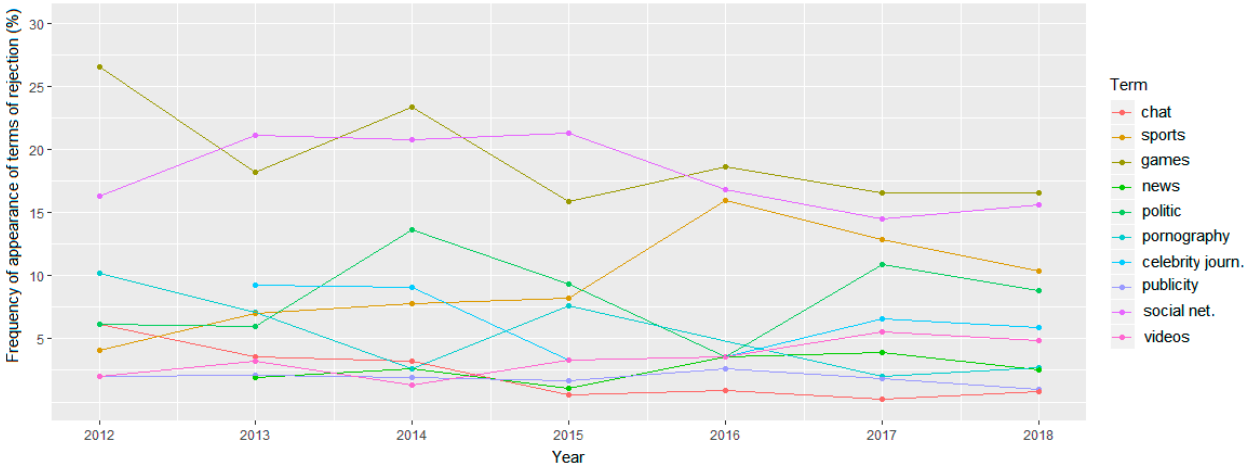

Figure 4. Annual variation of the 10 most common terms named by respondents as topics of rejection for web surfing.

To assess whether there are trends by country, three countries were selected that had a representative sample in the survey (Spain, Mexico, and Venezuela). The graphs below show trends in topics of interest (Figure 5) and rejection (Figure 6) when browsing the web by country.

It should be noted that only Spain has a study sample large enough to have the possibility of evaluating the patterns throughout the proposed study time. In this case, the three terms that remain the most mentioned by respondents over time are "news", "music", and "social networks". In Venezuela, there is an increase this year due to the interest in using the Internet for social networks and news.

In terms of rejection issues, the trends in Spain are similar to general trends, with games, politics, and tabloids being the most rejected terms. There is a slight increase in the percentages of rejection in recent years (2017 and 2018) towards the last two terms mentioned.

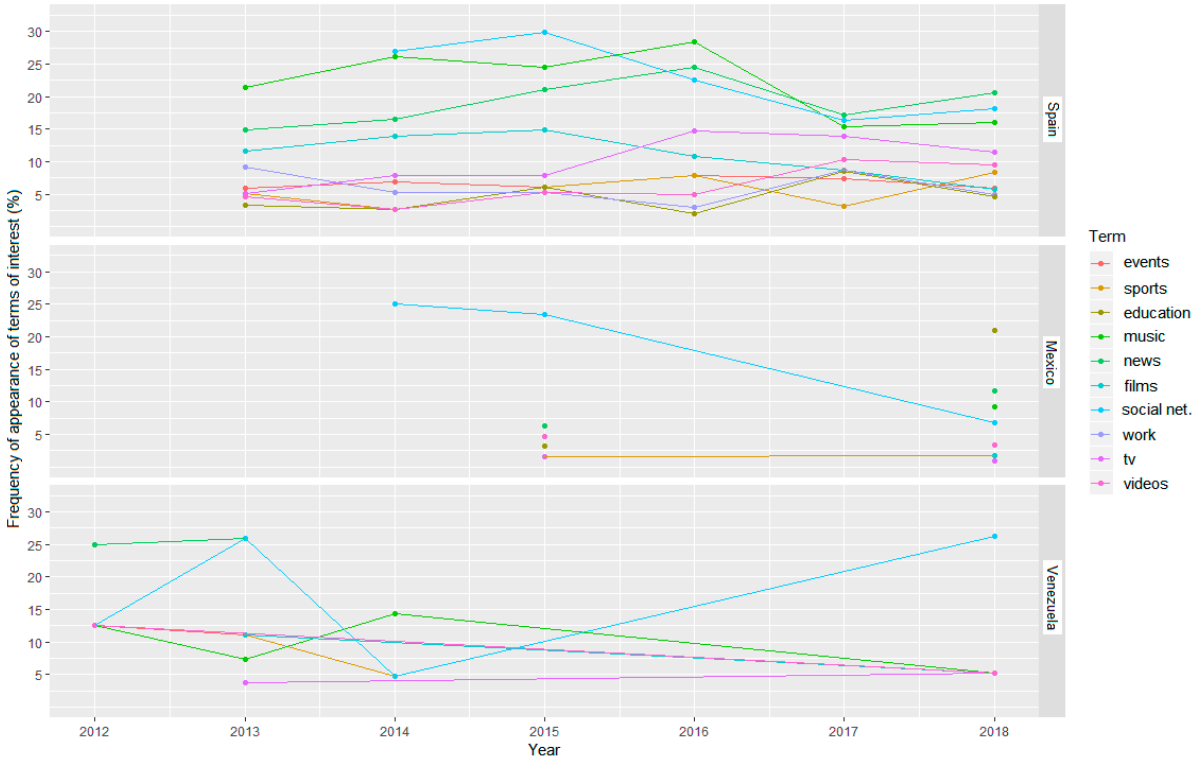

Figure 5. Temporal variation of the 10 most common terms named by respondents as topics of interest for web surfing (comparison of three selected countries).

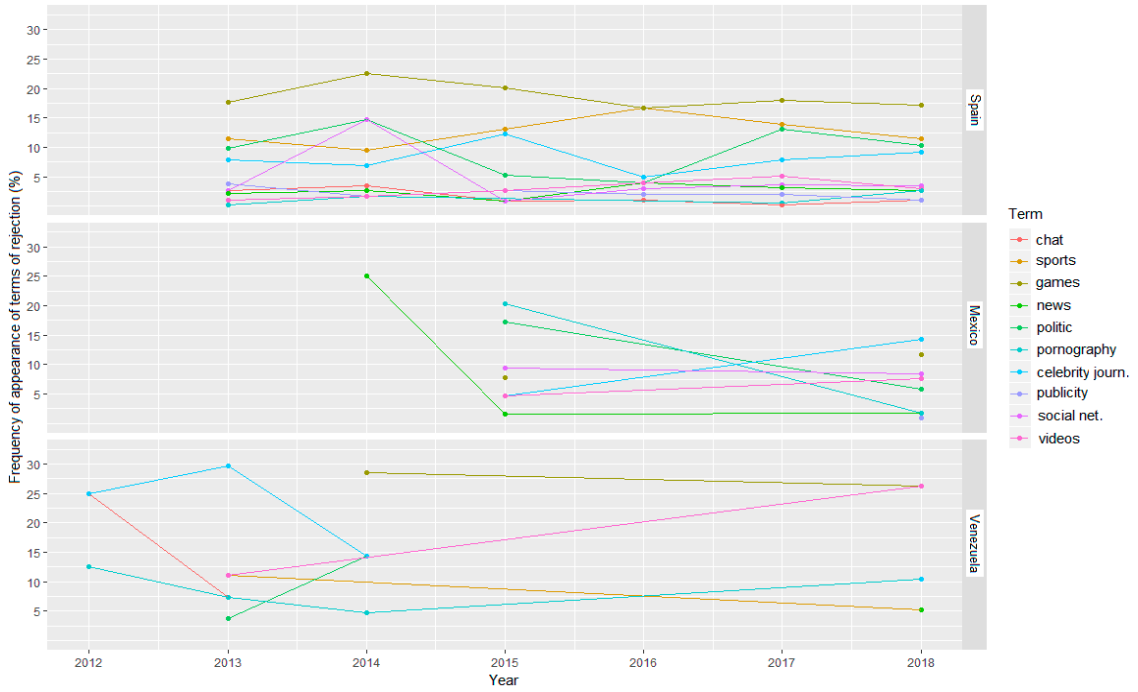

Figure 6. Temporal variation of the 10 most common terms named by respondents as topics of rejection for web surfing (comparison of three selected countries).

5. Discussion

As we have previously stated, the university world is currently immersed in a permanent dialogue with society on the developments of open innovation. This society is

dominated by the processes of digitalization and globalization, which are affecting all its structures, from economic and business to educational and cultural. In this context, the knowledge of the uses, behaviors, and habits in relation to the network society of the members of the university community is fundamental to adequately shape the structural dynamics that the university needs today.

Knowing the information flows and navigation patterns in the network, in this context, is very important. It must be considered that the dynamics of open innovation are structured on multiple levels. Not only do they affect high-tech multinational companies, where we could locate universities and research centers in parallel, but they also occur even in small and medium-sized enterprises (SMEs). As Van de Vrande et al. have shown [86], SMEs are involved in many open innovation practices, addressing various market-related reasons, such as satisfying customer demand or keeping up with competitors, or pursuing challenges related to organizational and cultural issues, such as responding to increased external contacts.

Many studies have determined that, for these and other reasons, open innovation occurs significantly at this scale [87–91], and that it is frequently carried out in collaboration with other companies and universities, especially at the local level [92,93], which promotes the need to get and exchange information and transfer knowledge.

The process that leads from open innovation to a creative business model has become a decisive resource for new entrepreneurs and is integrated into the dynamics of university education, especially in technological and strategic management, because of its great professional interest [94,95]. It is important to highlight that open innovation is one of the most debated topics in current research, approached from a multidisciplinary approach, but as Chiaroni et al. defend [96], it is still necessary to go deeper into various issues of this management paradigm, such as determining the anatomy of the process of organizational change through which a company goes from being a closed innovator to an open one.

This issue is even more important in university institutions, especially in the four organizational dimensions of any company: inter-organizational networks, organizational structures, evaluation processes, and knowledge management systems, along which change could be managed and stimulated [96,97]. We should not forget that, whether they are private or public, universities are organized as business entities focused on training, educational, scientific, and cultural products, and they adopt management structures similar to other corporations [98–100].

The development of business models based on open innovation has been extremely successful in recent years, sometimes with a global impact and in a brief time [101]. As showed by Gambardella and Panico [102], the power of open innovation is under-exploited, and the best results can be achieved by releasing enough power to decide to the assets involved. This is, of course, fundamental with higher education [103], and all of this is within the average balance necessary in the context described [104,105].

In the university environment, therefore, all the dynamics and attitudes that are generated within the organization must be known precisely. Any decision making must be based on this information, especially when open innovation processes are being developed. In all this structure, which is unique compared to other corporations, the figure of the student is decisive. They are the basis and the meaning of everything that constitutes higher education today [106]. It is necessary to obtain in this way, which is the basis of the objective of this research, the greatest possible knowledge about the current use of ICTs and the Internet in its multiple dimensions and while considering its evolution over time [107–110].

In this sense, an aspect of great interest is to determine which are the topics of interest, and which are those of rejection, when students are web surfing. Regarding which topics arouse the greatest interest in young Latin Americans during the years of implementation of the study, these are led by “use of social networks” and “news”, followed by “music”, “education”, “work”, “videos”, and “movies”. Searches for “social networks”

and "news" are two topics that have maintained their interest through the mass internet extension [111–116] and that remain in the top positions of some recent studies [38].

In contrast, and perhaps also linked to the responsible use of the Internet, this medium is not likely to arouse the interest of university students with "celebrity journalism", consumption of "online games" which can be addictive, and "pornography" and "politics", as reflected in recent research [117–121]. In the specific case of "pornography" and "online games", it can lead to addictions and mental disorders, thus being potentially harmful to young people [122–126].

From a transversal perspective, "news", "social networks", and "music" are the topics most used by Latin American students, following a general trend all over the world. Although interests may be heterogeneous, we cannot consider this group as closed and hermetic, as these topics of interest remain the most prominent in recent years. An example of this variety is that in terms of access to the internet for consumption, "social networks" is one of the topics that has been most rejected in recent years, along with "games", and to a lesser extent, "sports" and "politics".

With politics, the existing disenchantment is especially visible. This is especially interesting because of its relationship to fake news [127] and the attempt by the establishment to control or guide the national and international politics of states. A significant case, for example, is the case of Venezuela [128]. It is one country studied in our research. In the information's analysis obtained for this country, an increase in use of the Internet can be observed, compared to the other countries studied, to access "news". This is justified, of course, by the interest and relevance of university students on this issue.

6. Conclusions

Knowledge of the behavior and habits of the members of the university communities in relation to digital technologies and their use is fundamental for the development of the processes of open innovation, in which higher education is currently undergoing a process of transformation. The integration of this traditional institution into the new reality must be carried out in accordance with the most innovative economic, business, and social structures in which this new historical era is unfolding, based on information and communication flows.

Students, as one of the pillars of the university world, are also the future of society. Therefore, knowing their attitudes towards ICTs and how their lifestyle is so involved with them is crucial for the development of educational policies considering digital integration. In this research, we aimed to determine what their preferences and rejections are when they surf the net, centered in a certain social and cultural space.

From 2012 to 2019, for university students in Latin America, the principal topics of interest in Internet consumption were "social networks" and "news". Other highlights include "music", "education", "work", "videos", and "movies". However, no significant evolution was found to indicate that one of these topics has increased in interest exponentially. What is most striking, from an educational perspective, is that there has been no growth in "education", suggesting that there is still a long way to go for complete integration of higher education into the digital paradigm (if this had been the case, it would have been a topic of growing interest).

Likewise, there are constant themes that experience rejection by students: "Celebrity journalism", use of online games, pornography, and politics. These are topics that, regardless of their consumption of them, students consider rejecting and that are contrary to their presence on the Internet. In the group of countries studied in Latin America, there is a certain consensus in this sense.

In terms of trends, and based on the case of Spain, which presents a large sample that allows us to consistently evaluate these patterns, it can be noted that "news", "music", and "social networks" remain constant as the topics of most interest. In terms of rejection, not only do "games", "politics", and "celebrity journalism" appear, but for these last two topics, rejection has increased in recent years by university students.

As significant data, it is worth noting that in the case of Venezuela, there has been a relevant growth in the last year because of the use of the Internet for social networks and to consult news. It may be interpreted that the social and political situation of the country demands this use of the network.

Therefore, it is important to emphasize that the web surfing that Latin American students do on the Internet undoubtedly reflects the social realities in which they live. This can help us outline didactic proposals for the correct integration of ICTs in university contexts, and to lay the foundations for adequate digital literacy.

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