e-ISSN 2014-5039

OBRA DIGITAL
revista de comunicación

Communication and culture

UVIC
UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL
DE CATALUNYA

UNIVERSIDAD
DEL AZUAY

No. 18
February - August
2020

OBRA
revista de comunicación
DIGITAL

ISSN 2462-6384
e-ISSN 2014-5039

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

Documentalista / Documentalist

Diseño Gráfico / Graphic Design

Corrector de gramática y estilo / Grammar and style checker

Traductor / Translator

E

EDITORIAL

More than Communication, Culture

Más que Comunicación, Cultura

Mais que Comunicação, Cultura

Cecilia Ugalde

Faculty of Communication
University of Azuay

cugalde@uazuay.edu.ec
orcid.org/0000-0001-7716-6023

Abstract:
Communication goes beyond media and messages, it helps us to shape the social relationships through which we give meaning to our reality and culture. We try to give space to creativity and diverse areas of communication and culture, including subjects and voices frequently delayed.

KEYWORDS

Communication, Culture, Creativity, Reality.

Resumen:
La comunicación va más allá de los medios y mensajes, nos ayuda a dar forma a las relaciones sociales a través de las cuales damos sentido a nuestra realidad y cultura. Intentamos dar espacio a la creatividad y a áreas diversas de la comunicación y la cultura, incluyendo en la temática espacios y voces con frecuencia postergados.

PALABRAS CLAVE

Comunicación, Cultura, Creatividad, Realidad.

Resumo:
A comunicação vai além da mídia e das mensagens, nos ajuda a moldar as relações sociais através das quais damos sentido à nossa realidade e cultura. Tentamos dar espaço à criatividade e diversas áreas de comunicação e cultura, incluindo espaços e vozes frequentemente atrasados no assunto.

PALAVRAS-CHAVE

Comunicação, Cultura, Criatividade, Realidade.

Just over three decades ago, Jesús Martín Barbero (1989) spoke of the need to shift the concept of communication to the concept of culture. He talked about moving from a concept of communication caught in the problem of media, channels and messages, to a concept of culture in a more anthropological sense that allows us to think about the new processes of socialization. Processes through which society is reproduced with its codes of perception, assessment and symbolic production of reality. These allow us to think about communication processes from the problems and operations of social exchange, from their identity matrices and from conflicts that articulate culture (Martín-Barbero, 1989), a culture seen as a driving force of society and the economy. For its part, Bustamante (2008) leads us to seek an expansion of communication and culture:

> (...) that carries with it a cultural and informative democratization not only of the consumer's ability to choose (on different merchandise), but also of authentic citizen pluralism, which is necessarily based on maximum diversity of creative voices and expressions of social life values (ideology) accessible to the whole society. (p. 24)

Meanwhile, Carey (2008) argues that communication is not merely the transmission of information, but broadens its definition by including the ability to unite people by remembering the link between communication and community, which is culture. Thus, communication cannot be reduced solely to symbolic exchange because it also includes the material, emotional and affective dimensions that shape how meaning is shared and transformed over time and space. In summary, culture is not an epiphenomenon of values and norms that shape human behavior, but is entangled and represented through different moods, beliefs, desires and practices through which order is imposed upon chaos and uncertainty (Blue, 2019).

This monographic number 18 of Obra Digital clearly shows that the displacement that Martín-Barbero (1989) refers to has happened and that we think of culture with its processes of socialization and codes in a broader sense, far from being trapped in communication as a purely media problem. Our first article takes as its main theme the educational digital games, about which Sánchez i Peris (2015) commented:

> The use of game methodologies for "serious work" is an excellent way to increase concentration, effort and motivation based on recognition, achievement, competence, collaboration, self-expression and all educational potentials shared by ludic activities. (p. 13)

Within these "serious works" for which the methodology of the game is used, we present an analysis on gender, technology and video games. On the other hand, the article we publish on culture, heritage and tourism as fields of study for communication presents us a systematic review of recent Hispanic literature. This allows us to observe the increase in research and publication of topics on this area. Literature is also present in the article with the representation of women as a cultural historical subject in two literary works: No me agarran viva by Claribel Alegría and Darwin J. Flakoll; and La mujer habitada by Gioconda Belli. On the other hand, the oral tradition of some groups of the Amazon in this era of globalization is addressed in an article that comes to us from the Czech Republic, highlighting the dangers they are in and the importance of their conservation as a fundamental part of a cultural wealth that belongs to the planet.

The creativity put at the service of the most vulnerable is shown in the article: Innovation conceived as resistance in design: a twist in the concept in contrast to the guidelines of the Oslo Manual. This article presents a design case of a type of adjustable size sandal designed for children living in extreme poverty. Finally, our miscellaneous section presents two articles that we invite you to read. The first is about the university fact checking of the presidential debate in Chile 2017 and the second is about a characterization of the master's program degrees in mathematics in Brazil.

Thus, this monograph on "Communication and Culture", corresponding to the months of February - August 2020, presents eight articles sent from five countries (Portugal, Czech Republic, United States, Brazil and Chile) and published in its original versions in Portuguese, Spanish and English. In addition, they are presented in a full version in English for greater reach and dissemination. It is a small window to everything that communication and culture, as intimately linked issues, present to us today. We hope you enjoy them.

References

Blue, G. (2019). Science communication is culture: foregrounding ritual in the public communication of science. *Science Communication*, 41(2), 243-253. doi: 10.1177/1075547018816456

Bustamante, E. (2008). *Comunicación y cultura en la era digital: industrias, mercados y diversidad en España* (Vol. 24). Editorial Gedisa.

Carey, J. W. (2008). *Communication as culture, revised edition: Essays on media and society*. Routledge.

Martín Barbero, J. (1989). Comunicación y cultura. *Telos*, 19, 21-26.

Sánchez i Peris, F. J. (2015). Gamificación. *Education in the Knowledge Society*, 16(2), 13-15.

Communication and culture

Comunicación y cultura

Comunicação e cultura

I

INTRODUCTION

Ruth S. Contreras Espinosa

Universitat de Vic-Universitat Central de Catalunya
Professor of the Department of Communication. Editor of the Obra Digital magazine.

ruth.contreras@uvic.cat
orcid.org/0000-0002-9699-9087

Abstract:
Communication is a symbolic and impersonal, expressive and personal language. In both cases, communication works to achieve an understanding between individuals that are the most basic part of the culture. Its function is to achieve and maintain an understanding among individuals who live in society. Everything complements each other, since communication functions as a socializing "whole" or as an integrating element that operates in two dimensions.

KEYWORDS

Communication, Culture, Research, Society.

Resumen:
La comunicación es un lenguaje simbólico e impersonal, expresivo y personal. En ambos casos, la comunicación trabaja para lograr un entendimiento entre los individuos que son la parte más básica de la cultura. Su función es lograr y mantener la comprensión entre los individuos que viven en sociedad y fomentar. Todo se complementa entre sí, ya que la comunicación funciona como un "todo" socializador o como un elemento integrador que opera en dos dimensiones.

PALABRAS CLAVE

Comunicación, Cultura, Investigación, Sociedad.

Resumo:

A comunicação é uma linguagem simbólica e impessoal, expressiva e pessoal. Nos dois casos, a comunicação trabalha para alcançar um entendimento entre os indivíduos que são a parte mais básica da cultura. Sua função é alcançar e manter a compreensão entre os indivíduos que vivem na sociedade. Tudo se complementa, pois, a comunicação funciona como um "todo" socializante ou como um elemento integrador que opera em duas dimensões.

PALAVRAS-CHAVE

Comunicação, Cultura, Pesquisa, Sociedade.

The eighteenth issue of the Obra Digital magazine provides the reader with different views on communication and culture. Communication is a symbolic and impersonal language, for example, hieroglyphics. It is expressive and personal like art. In both cases, these forms of communication work to achieve an understanding between individuals that are the most basic part of the culture. Its social function seems to be to achieve and maintain understanding among those individuals who live in a society and foster cultural solidarity between them. It could be said that this social function contrasts with the competition that seeks to achieve an orderly distribution and division of labor among individuals in a society. Everything complements each other, since communication functions as a socializing "whole" or as an integrating element that operates in two dimensions. On the one hand, it serves to provide cultural features and expand its cultural area within which social relationships can exist.

On the other hand, communication focuses on bringing common understanding and dispersing new ideas that inevitably arise in the acculturation process. The diffusion and acculturation processes seem to take place in the conditions that arise and spread the news. It is characteristic of news to circulate until the message is understood or that the disseminated images create an effect on local cultures.

To a large extent, the authors of the articles presented here seek to reflect on communication and culture and put their reflections to the readers' consideration.

The monograph consists of eight articles. In the first text entitled *Educational Digital Games: Tensioning the Production Process*, the authors William de Souza Santos and Lynn Rosalina Gama Alves, present an investigation with an exploratory character that seeks to discuss what elements should be contemplated in digital educational games, as well as its levels of importance. The results of this research revealed the dichotomy between developers, teachers and players of what should be a digital educational game and what characteristics should be prioritized.

Athena Alchazidu, presents an interesting reflection on *Globalization and oral traditions: Some Remarks on Indigenous Orality in the Amazon*. Indigenous orality represents an important part in the daily life of the Amerindian communities in the Ecuadorian Amazon region. It is important to see in this phenomenon a symptom of serious threats that can lead to the extinction of these indigenous languages. According to recent research, several languages spoken in the communities of Ecuador are considered to be in danger of extinction. Effective prevention can be promoted by academic projects focused on encouraging indigenous speakers of all generations to use the language regularly in ordinary situations and promoting indigenous languages to become the language of instruction used in official educational institutions.

Culture, heritage and tourism as study fields for communication: a systematic review of recent Hispanic literature is the text presented by Valeriano Piñeiro-Naval and Ricardo Morais. Communication research is interdisciplinary in nature, with very diverse thematic interests and has grown exponentially. The purpose of this study is, therefore, to observe what space they occupy and how the fields of culture, heritage and tourism are addressed in various articles published in Hispanic communication magazines during the period from 2013-2017. Methodologically, the techniques of bibliometry and meta-research were combined to address aspects such as authorship or financing of works and identify the objects of study, theories or methodologies used in the 120 manuscripts that formed the sample of this work.

The author Karen Julissa Barahona Posada presents us, *The representation of women as a cultural historical subject in two literary works: "No me agarran viva" by Claribel Alegría and Darwin J. Flakoll and "La mujer habitada" by Gioconda Belli*. In Nicaragua and El Salvador, the revolutions of the 1970s and 1980s ended the era of military dictatorships and women redefined their political identity through revolutionary participation. Gioconda Belli reflected the Sandinismo in her works and in La mujer habitada, which marks the role of the Nicaraguan during the revolution. In the same way, Claribel Alegría represented the Salvadoran revolutionary woman in her testimonial novel No me agarran viva. The purpose of this work is to demonstrate how the works rewrite history to vindicate women as a historical subject in Nicaragua and El Salvador.

The text entitled *Notes on gender, technology and videogames*, seeks to investigate the digital gaps generated by gender hierarchies that affect the way women develop, disseminate and appropriate technologies. To do this, it shows some relationships between gender and technology to get closer to the universe of games. In addition, it includes the concept "videogame" as a boys thing, to show how technologies have gradually distanced themselves from the world of girls. Today, the reverse path is being taken by a new generation of women who create initiatives and projects related to videogames not only in Brazil but throughout the world. This article is presented by Renata Jéssica Galdino and Tarcisio Torres Silva.

Finally, in the monographic part, *Innovation conceived as resistance in Design: a twist in the concept in contrast to the guidelines of the Oslo Manual*, aims to explore the concept of innovation through the design case of The Shoe that Grows, a type of sandal of adjustable size designed to adapt to children living in extreme poverty. The case attracts attention because it meets a human need and uses design and business strategies to democratize access to footwear. Through a review of the literature, taking the Oslo manual as its main contribution, it presents a shift in the concept of innovation that can be understood as a criticism. Its authors are Cecília Oliveira Boanova and Raquel Paiva Godinho.

I do not want to close this text without inviting our readers to consult the two miscellaneous articles that make up our eighteen issue. The author Enrique Nuñez-Mussa presents *How to verify without experts and reach the big leagues: University fact checking of the presidential debate of Chile in 2017*. The article presents the teaching methodology applied in a fact checking project to verify the presidential campaign and televised debate of the 2017 elections in Chile during a journalism undergraduate course. The design and development of this project is explained. Its journalistic and learning results are analyzed, among which is been shortlisted in a professional excellence award. It exposes the assessment made by the students of their learning when verifying the public discourse of the authorities and their contribution to democracy in the role of watchdog.

In *Master's degree programs in Mathematics in Brazil: an application of networks to characterize their titles*, the authors Inácio de Sousa Fadigas, Trazíbulo Henrique, Marcos Grilo and Hernane Borges de Barros Pereira, present a network analysis of the titles of various master's degree projects in mathematics of Brazil. The analysis uses semantic networks of degrees (SND) characterized qualitatively and quantitatively. For this, 41 training courses were selected and a click network approach was used, in which the words of the links are connected. Louvain's method (algorithm) was applied to detect communities of words. The networks were characterized and grouped by region and geographic area, which led to inferences from regions based on regularity or not of word groups.

We believe this publication will be beneficial for professionals and students. I hope you find in each of the articles a new motivation to expand knowledge about communication and culture, whatever your context and area of action.

Digital Educational Games: Tensioning the Production Process

Juegos digitales educativos: tensionar el proceso de producción

Jogos Digitais Educacionais: Tensionamentos no Processo de Produção

1

ARTICLE

William de Souza Santos

Federal Institute of Paraíba

Postdoctor - Postgraduate Program in Teaching, Philosophy and History of Sciences - UFBa. Doctor and Master in Computational Modeling of Cognitive Systems - Senai / Cimatec. Specialist in Education, Communication and Technologies in Digital Interfaces. Specialist in Mathematics Teaching Methodology. He has a degree in Mathematics. Creator of the Virtual Mathematics Reinforcement website. www.reforcovirtualdematematica.com.br. Pedagogical Consultant in the Mathematics Area in the creation of digital games. His area of interest is Mathematics Education and Technologies.

william_tenor@yahoo.com.br
orcid.org/0000-0002-8598-9756

Lynn Rosalina Gama Alves

Federal University of Bahia

Fellow of Productivity Technological Development and Innovative Extension of CNPq - Level 2, she has a degree in Pedagogy from the Faculty of Education of Bahia (1985), Master degree (1998) and Doctorate (2004) in Education from the Federal University of Bahia. Her postdoctoral fellow was in the area of electronic games and learning at the Università degli Studi di Torino in Italy. She is currently a professor and researcher at the Institute of Humanities, Arts and Science - IHAC - UFBA. She has experience in the area of Education and Digital Games. She has conducted research on the digital universe and its interfaces, especially on the following topics: electronic games, interactivity, mobility and education. She has also investigated the television serial narratives. Coordinator of research and development in digital games projects such as: Triad (FINEP / FAPESB / UNEB), Buzios: Echoes of Freedom (FAPESB), Forest Guardians (CNPq, FAPESB, Proforte), Brazil 2014: Towards Hexa (SEC- Ba), Insitu (SEC-Ba), Industriali (SEC-Ba), Games studies (FAPESB), DOM (SEC-Ba), Janus (SEC-Ba) and Gamebook (CAPES / FAPESB). For eleven years, she has been organizing and coordinating the Seminar on Electronic Games, Education and Communication - building new trails. Research group productions are available at the URL: www.comunidadesvirtuais.pro.br

lynnalves@gmail.com
orcid.org/0000-0003-3688-3506

RECEIVED: December 17, 2019 / ACCEPTED: January 19, 2020

Abstract

In 2018, the Gamer Census conducted in Brazil recorded that the production of digital educational games surpassed entertainment games, showing a growing interest in the production of this type of learning oriented games. This research has an exploratory character and seeks to discuss which elements should be contemplated in digital educational games, as well as their levels of importance. The results of this research revealed the dichotomy between developers, teachers and players of what should be a digital educational game and what features should be prioritized.

KEYWORDS

Digital games, Game development, Digital educational games.

Resumen

En 2018, el Censo de jugadores realizado en Brasil informó que la producción de juegos digitales educativos superó a la de los juegos de entretenimiento, lo que indica un creciente interés en la producción de este tipo de juegos orientados al aprendizaje. La investigación presentada aquí tiene un carácter exploratorio y busca discutir qué elementos deben contemplarse en los juegos digitales educativos, así como sus niveles de importancia. Los resultados de esta investigación revelaron la dicotomía entre desarrolladores, maestros y jugadores acerca de lo que debería ser un juego digital educativo y qué características deberían priorizarse

PALABRAS CLAVE

Juegos digitales, Desarrollo de juegos, Juegos digitales educativos.

Resumo

No ano de 2018, o Censo Gamer realizado no Brasil registrou que a produção de jogos digitais educacionais superou a dos jogos de entretenimento, sinalizando um crescimento do interesse na produção desse tipo de jogo voltado para a aprendizagem. A pesquisa aqui apresentada possui um caráter exploratório, e busca discutir quais elementos devem ser contemplados nos jogos digitais educacionais, como também seus níveis de importância. Os resultados dessa pesquisa revelaram a dicotomia entre desenvolvedores, professores e jogadores do que deve vir a ser um jogo digital educacional e quais características devem ser priorizadas por eles.

PALAVRAS-CHAVE

Jogos digitais, Desenvolvimento de jogos, Jogos digitais educacionais.

1. INTRODUCTION

Globally, digital games have been used for various purposes besides entertainment. An example of this are educational games, whose purpose is to mediate learning, allow the construction of school knowledge and stimulate motor, affective or cognitive skills.

Studies by researchers such as Boyle, Connolly and Hainey (2011) sug-gest that teaching based on digital games can provide effective learning experiences. Authors such as Petry, Contreras Espinosa and Eguia Gómez share the same point of view. Their articles are organized in the book written by Alves and Coutinho (2016) and indicate that research conducted in Europe through focus groups, observations, case studies and content analysis, show that games can effectively contribute to learning.

This is one of the reasons why the digital games industry, especially the Brazilian one, has invested in the production of educational games. The 2nd Brazilian Gamer Census of 2018, ABRAGAMES (2018), showed that the production of these interactive educational environments exceeded the production of commercial games (entertainment). According to the overall census, 874 games were educational and 785 games were for entertainment purposes only, out of the total of 1,718 games produced in Brazil. However, it is important to note that this production is not significantly reflected in the pedagogical practices with games in public and private schools. There have only been occasional experiences such as the Virtual Communities Group, Joy Street productions, among others.

The lack of infrastructure in schools or the quality of games can generate a difficult environment, which may be related to the lack of teacher interaction with educational games. This article aims to discuss how to develop digital educational games that motivate teachers and students, along with the evaluation of what characteristics these games should have.

2. HOW EDUCATIONAL GAMES ARE AND HOW THEY SHOULD BE?

According to Domingues (2018),

> ...os serious games pretendem que, por meio de sua aplicação, os seus usuários "sintam" um impulso de fazer uma tarefa que de outro modo não estariam tão atraídos em realizar. Ou seja, o que se pretende é que os seus usuários se sintam motivados a executar uma atividade sem grandes dificuldades, algo que os jogos normalmente fazem muito bem. (p. 12)

Despite this perspective, digital educational games do not have to stimulate their players to immerse themselves in narratives, stay motivated and entertain themselves. According to Resnick (2004), entertainment in digital games is a reward after fulfilling missions around school content that need to be learned. That is, the player needs to learn the content before having fun.

As Costa (2009) cites, educational games in general are not fun, while entertainment games have good learning outcomes and are fun. Considering what Costa says, it can be deduced that there is something that does not work with educational games. Perhaps they focus more on content or exercises, when they could learn from games created for entertainment that allow players to experiment joy, entertainment and fun (it emphasizes some exceptions where games such as Assassin's Creed are also being used in school spaces).

For Costa (2009), the development of educational games should be based on the assumption that an educational game must be an entertainment game created from the structure of the knowledge object and not an adapted entertainment game.

This fact was considered by Santos (2014) in the game development process of DOM[1]. According to the author, this game was born from the perspective of articulating the content of quadratic functions with the entertainment and fun features of a game created solely for entertainment purposes. Within an interesting and immersive narrative, the player has direct and

1 Available at: http://comunidadesvirtuais.pro.br/cv/games/#4

indirect access to the content without breaking the dynamics of the adventure.

Despite these experiences, such attractive educational games are not evident in most cases. Most educational games are memory games and other casual games that are often confused with virtualized exercises. In addition, the educational "stamp" presented on the name of the games causes a distance from the students, since their immersion in the school universe is characterized as an obligation and not as a recreational space. In this way, an educational game is related to uninteresting situations for users.

Trying to reverse this stigma, there have been attempts to develop educational games that are closer to the characteristics of entertainment games and that can also directly or indirectly fulfill pedagogical purposes.

To deepen the study, the founding elements present in educational games were characterized by the research detailed in the next section.

3. MATERIALS AND METHODS

To identify how educational digital games are characterized, a review was performed with the literature database (Thomson Reuters, Educational Resources Information Center (ERIC)), the CAPES Thesis Database and the records of the main gaming events from Brazil: The Brazilian Symposium on Games and Digital Entertainment (SBGAMES) and the Seminar on Electronic Games, Education and Communication (SJEEC).

This research conducted in 2018, looked for productions in the Portuguese or English languages with the descriptors of digital games and evaluation produced between 2012 and 2017. When analyzing the productions that evidenced the application of digital games in educational contexts, some elements considered important for digital educational games were identified (it is observed that the emphasis is instrumental, that is, games are present in the school context for a particular purpose: to help learn a concept). The analyzed productions showed the following aspects: immediate and constructive feedback, clear and well-defined educational objectives, challenges in levels, levels of interactivity, concept integration, narrative, transmedia, learning curve and collaborative practices.

After classifying these aspects, an investigation was carried out with a sample of 86 students, professionals and academics from the areas of games and digital technologies. The study was conducted through social networks (Facebook and WhatsApp) and mailing lists (with an online questionnaire available on Google). It was evaluated which of the aspects presented above must be present in a digital game developed for educational purposes.

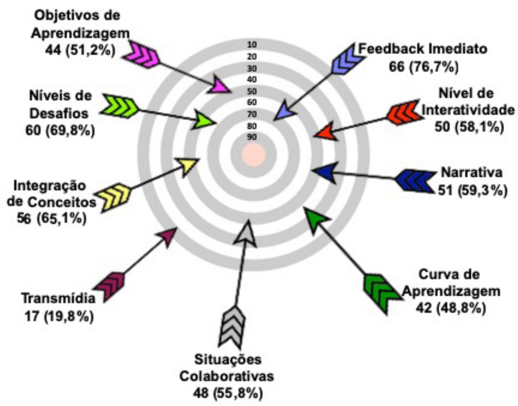

Figure 1. Selected elements

From this survey, it was shown that eight of the nine elements presented similar values. The deleted element (less chosen) was "transmedia". It is considered that research participants cannot yet relate the transmedia extensions that occur for different narratives as an important possibility in the learning scenario. Our hypothesis is that games produced for education are often mini games or casual games that do not start from a narrative that allows the construction and expansion of a transmedia universe, such as games produced by Ubisoft.

The Analytical Hierarchy Process Method – AHP[2], is a decision making technique that establishes the relative importance between several criteria, comparing and placing them in a general classification of alternatives. This was the method that was used to establish the level of importance of each of the elements indicated above.

In this stage, 66 responses were obtained and the subjects involved in the research were classified according to their training and their level of experience in digital games, as can be seen in Table 01.

Experience / Training	High	Medium	Low	Total
Graduates / Students	2	7	2	11
Specialists	7	2	3	12
Masters	10	12	2	24
Doctors	11	4	4	19
Total	**30**	**25**	**11**	**66**

Table 1. Training and Experience

According to the training of the participants, this division allowed to establish relations between the educational level and the generational stages in which they were, paying attention to their level of experience or knowledge in the area of digital games.

2 The full application of this method can be found in the thesis of one of the authors at the link: https://12c3b48d-162b-3b3a-fc8a-2606b9d4af6e.filesusr.com/ugd/5d4133_778e405012704102b37c134417d2ca81.pdf

4. RESULTS

After applying the AHP Method, the elements could be compared within the level of importance recorded from their positions, as can be seen in Figure 2.

Analyzing these data based on the training of the participants, it can be evidenced that the graduates/students think that digital educational games must prioritize the levels of interactivity, increase the levels of challenge and the integration of concepts. In order to identify the motivators of this selection, it must be remembered that the graduates/students were part of Generación Z which, according to McGonigal (2011), is composed of young people with an average of 21 years of age who have spent over ten thousand hours with digital games and have invested only three thousand hours reading books in their life.

The integration of concepts, objectives of learning and feedback were the aspects of the composition of digital educational games that drew the attention of people with more specialization. For those with a master's degree, the most important elements are interactivity, integration of concepts and learning objectives. For those who have completed a doctorate, priority is given to learning objectives, feedback and concept integration.

As a result of observing these four profiles, the learning objectives stand out as one of the three elements that experts and people with fourth level education consider most important for digital educational games. Here appears the first disagreement on the conception of digital educational games. Expectations for students/graduates are different from those who intend to use these resources with educational purposes, that is, their teachers. Taking into account

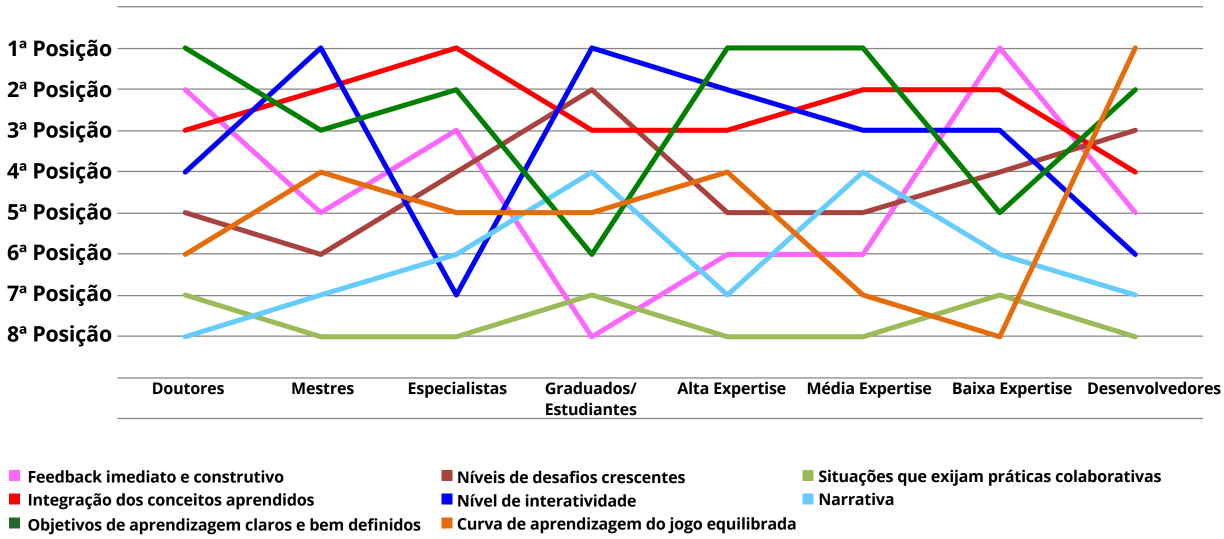

Figure 2. Comparative Chart

that most of them are consumers of digital games for entertainment.

Here are the main problems in the development of digital games for school learning scenarios: neglecting entertainment and forgetting that games have to be fun. This is what the study seeks to find, the idea that it is possible to have fun and learn, as is evidenced in Minecraft.

In the conception of teachers, the resources used in the school must seek the learning of contents. This criterion becomes a priority. As quoted by Pretto (2013), teachers have an instrumental perspective of technologies, but they consider them as simple animators of classes without building a view that can identify them as elements that enhance pedagogical prac-tices. Therefore, when thinking about digital games as animated electronic books, basic characteristics of these artifacts are neglected: entertain or allow to distance from real life, for example (Huizinga, 2000).

This dichotomy of views has sparked a discussion about entertainment and educational games, which are not so fun. For this reason, students and players are not interested in interacting with this type of game.

An issue that is shown in the comparative graph (figure 02) is the low score in "situations that require collaborative practice". In spite of the fact that collaboration could be one of the important factors for success in multiplayer games, this potential for educational games is not perceived. This is a major contradiction, considering that educational practices must prioritize collaboration and cooperation over competition and individual learning.

A possible reason for this is that the skills related to social interaction and collaboration in problem solving are not always evident in schools. Usually, the students think that group work has to be done individually to be later integrated; they do their part instead of looking for collaborative work. Therefore, these skills are also not considered for digital games. This information is based on the experience of the authors of this article, who have been working on basic and higher education during more than twenty years.

Another point that can be observed is the place occupied by the narrative for interviewees who are farther from the students. For graduates/students, the narrative is an element of intermediate importance, while it is the penultimate item for people with fourth level education. According to Alves, Martins and Neves (2009):

> [...] One of the factors that attracts more players to the narratives offered by the games is the possibility of choosing a path that often goes beyond the common linear logic of conventional narrative formats. Another important factor is that the narrative of games is not simply understood and interpreted by the players, but experienced and defined through the transformation of players into characters. (p.10)

For this reason, the narrative is an important element for the player to be transported to the fictional world of the game and have a greater immersive experience. This fact is also evidenced by game developers who have invested heavily in digital game narratives, as noted in the Assassin's Creed and God of War games. On the other hand, educational games have not yet presented good narratives, becoming boring games that do not attract. They often become virtualized exercises without a context or story that connects them to the logic of the game. Usually, "mini games" have no relation to the main theme of the game. However, the opening of courses and book publications that discuss the participation of the narrative in education is emphasized at the market level. The culture is marked by narratives that seduce, involve and motivate humans.

A similar behavior was found with the “increasing challenge of levels” item whose importance decreased with the increase in the level of education. It is common for players that the challenges grow at each stage of the game, since the player needs to establish new strategies using previously acquired knowledge for each new challenge in order to win.

> One of the most important points in the games is the conflict because each player seeks appropriate challenges, thereby solving the problem of game balance. This is why mechanisms must be created to adequately challenge the player, avoiding boring him with trivial tasks or frustrating him with impossible tasks. (Andrade et al., 2005, p.13)

For this reason, authors such as Gee (2005) point out that the school needs to learn from game designers how to propose a balance in activities and challenges for students, offering rewards and learning compatible with their experiences in the game. Therefore, paying attention to the learning curve present in the "gameplay" is essential.

Analyzing the obtained data and taking into account the level of experience of the subjects, it is observed that the responses of those who consider themselves with little experience in the field of digital games, the three most important elements were: feedback, integration of concepts and “interactivity”. For those who consider themselves of medium expertise, the three priorities were "clear and well defined learning objectives", "integration of concepts learned " and "level of interactivity".

A similar event occurred with those who consider themselves very skilled in digital games, who maintained these same elements as priorities. However, "clear and well defined learning objectives" remained first, "level of interactivity" ranked second and "integration of concepts learned" ranked third.

Analyzing the comparative chart (Figure 02), it was possible to identify that the integration of concepts learned is an element that remains in the first positions, regardless of the level of experience. This highlights the importance of the application of concepts and their feedback in a digital educational game.

This fact is corroborated in the discourse of Botelho (2004) when he states that:

> digital games can be used for operational skills training, awareness and motivation reinforcement, knowledge and perception development, communication and cooperation training, integration and practical application of the concepts learned, and even the evaluation. (p.12)

The level of interactivity is also among the most important elements. According to Prensky (2012), interactivity is present in digital games through practice and feedback. That is, the player learns through tests and errors. The player must be free to act guided by objectives, discover-ies, tasks and questions in order to have a better immersion in the activity.

There is also an increase in the importance of the item “clear and well defined learning objectives” for those with a higher level of expertise, which shows the concern that educational games need to define this item well as a way to better mediate learning.

Corroborating this thought, Lemos (2016) indicates that:

> To be used for educational purposes, games must have well defined learning objectives, teach the content of the subjects or promote the development of important strategies or skills to increase the cognitive and intellectual capacity of students. (p. 11)

According to the author, it is possible to note that she relates the learning objectives to content teaching. Which indicates that if the game aims to teach certain content, there is a need to define learning objectives. On the other hand, if the game seeks to promote the development of other skills, defining them would not be necessary.

A controversial element in the comparisons was the feedback, which decreased in importance as the level of experience increased. This fact is contrary to the perspective of authors such as Rhodes et al. (2017), Freitas Araújo and Almondes (2015), Tonéis (2015), Sung, Chang and Liu (2016), who defend the importance of this element as one of the main items to be considered in educational digital games.

Looking at the perspective of the developers, it can be seen that digital games for educational purposes should include a "balanced learning curve", followed by "clear and well defined learning objects" and "increasing challenge of levels." Considering these data, it is important to keep in mind that, as developers, these professionals seek to produce a game whose design attracts their consumers and provides a better immersion and flow experience. Attention to the learning curve is key for this to happen, as it motivates players to interact continuously and maintains their persistence and tolerance towards "mistakes" and losses.

According to Trois and Silva (2012), a game must have a well balanced learning curve. If it is very flat, active perception, fun and learning are less intense. If the curve is too high, it will make the player find the game difficult and lose interest in it.

5. CONCLUSIONS

Digital Game Based Learning (DGBL) is gaining importance on the world stage as the production of these technologies increases.

The data presented confirm the premise that games for educational purposes are not fun like entertainment games (commercial games). The latter, ironically, end up being more effective than educational games when used for pedagogical purposes.

Through the analysis of the data presented in this research, it was observed that the generational differences impact on the understanding of how a digital educational game should be. Students, people with third and fourth level education and developers understand digital educational games from completely different points of view and this has a strong impact on the final product that is developed and used in schools.

What most interests players is to immerse themselves in the fictional environment created by digital games and for this reason they prefer interactivity and challenges. People with more training, masters or doctorates, often focus on preparation through continuous evaluations and seek to address the integration of concepts and learning objectives.

Taking these results into account, it becomes increasingly necessary to discuss the participation of entertainment games in education, the differences between them and the games produced for educational purposes. The best way is to listen to students and learn about their experiences and interests around the digital universe and, especially, digital games. In this way, games can be produced in tune with the desires and interests of the users, but considering the school concepts that must be presented and stimulated. At the same time, the specificity of digital games as a product and as a language with its limits and possibilities must be respected.

We believe that the findings and confirmations of previous studies evidenced in this article can support the development of new digital educational games and support what teachers and game designers should consider in the production of these media in order to make them more effective in school learning.

BIBLIOGRAPHY

ABRAGAMES - Associação Brasileira das Empresas Desenvolvedoras de Jogos Digitais. (2018). Dados sobre o Mercado de Games do Brasil. Retrieved from: http://www.abragames.org/o-que-estamos-fazendo

Alves, L., and Coutinho, I. (2016). Games e educação: Nas trilhas da avaliação baseada em evidências. In: Alves, L., Coutinho, I. (Org.). *Jogos digitais e aprendizagem: Fundamentos para uma prática baseada em evidências* (pp. 9–15). Campinas-SP: Papirus.

Alves, L., Martins, J., and Neves, I. (2009). A crescente presença da narrativa nos jogos eletrônicos. In: *VIII Brazilian Symposium on Games and Digital Entertainment*. PUC. Rio de Janeiro. Rio de Janeiro: [s.n.]. Retrieved from: http://www.sbgames.org/papers/sbgames09/culture/full/cult2_09.pdf

Andrade, G., Ramalho, G., Santana H., and Corruble, V. (2005). Challenge-sensitive action selection: an application to game balancing. In: *IEEE. Intelligent agent technology*, ieee/wic/acm international conference (pp. 194–200). France: Compiegne. Retrieved from: http://repositorio.roca.utfpr.edu.br/jspui/bitstream/1/8329/1/PG_COCIC_2017_2_09.pdf

Boyle, E., Connolly, T. M., and Hainey, T. (2011). The role of psychology in understanding the impact of computer games. *Entertainment Computing,* 2(2), 69–74. Retrieved from: https://www.sciencedirect.com/science/article/pii/S1875952110000200

Botelho, L. (2004). Jogos educacionais aplicados ao e-learning. São Paulo. Retrieved from http://www.elearningbrasil.com.br/news/artigos/artigo_48.asp

Costa, L. D. (2009). O que os jogos de entretenimento têm que os jogos educativos não têm. *In VIII Brazilian Symposium on Games and Digital Entertainment: 8-10 de outubro de 2009* (pp. 8-10). Rio de Janeiro.

Domingues, D. (2018). O sentido da Gamificação. In: *Gamificação em debate* / Organização de Lucia Santaella, Sérgio Nesteriuk, Fabricio Fava. – São Paulo: Blucher.

Freitas-Araújo, D. de, *and* Almondes, K. M. de. (2015). Evaluation of intervention with electronic games upon cognitive processes of elementary school students in a Brazilian state-run school: the role of sleep. B*iological rhythm research*, 46(3), 389 – 401. doi:10.1080/09291016.2015.1015234

Gee, P. (2005). Learning by design: Good video games as learning machines. *E-Learning and Digital Media*, 2(1), 5–16. doi:10.2304/elea.2005.2.1.5

Huizinga, J. (2000). *Homo ludens*. Trad. João Paulo Monteiro.

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: NYU press. Retrieved from: https://www.hse.ru/data/2016/03/15/1127638366/Henry%20Jenkins%20Convergence%20culture%20where%20old%20and%20new%20media%20collide%20%202006.pdf

Lemos, R. da F. (2016). *O uso dos jogos digitais como atividades didáticas no 2° ano do ensino fundamental*. 26 f. Monografia Especialização — Universidade Federal de Santa Catarina. Retrieved from: https://repositorio.ufsc.br/bitstream/handle/123456789/168860/TCC_Lemos.pdf?squence=1&isAllowed=y

McGonigal, J. (2011). *Reality is broken: Why games make us better and how they can change the world*. New York: Penguin.

Prensky, M. (2012). *Aprendizagem baseada em jogos digitais*. SENAC, São Paulo, p. 575.

Pretto, N. de L. (2013). *Uma escola com/sem futuro: Educação e multimídia.* EDUFBA, Salvador.

Resnick, M. (2004). Edutainment? No thanks. I prefer playful learning. *Associazione Civita Report on Edutainment*, MIT Media Laboratory, 14, 1-4.

Rhodes, R. E. *et al*. (2017) Teaching decision making with serious games: An independent evaluation. *Games and Culture*, 12(3), 233–251. doi:10.1177/1555412016686642

Santos, W. S. (2014). *DOM: um modelo de game para a aprendizagem das funções quadráticas no ensino médio*. Dissertação. Programa de Pós-Graduação em Modelagem Computacional e Tecnologia Industrial - Centro Universitário Senai Cimatec, Salvador/BA.

Santos, W. S. (2018). *PAJED: um modelo de avaliação para jogos digitais educacionais.* Retrieved from: https://12c3b48d-162b-3b3a-fc8a-2606b9d4af6e.filesusr.com/ugd/5d4133_778e405012704102b37c134417d2ca81.pdf

Sung, Y-T., Chang, K-E., and Liu, T-C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta- analysis and research synthesis. *Computers & Education*, 94, 252–275. Retrieved from: https://www.sciencedirect.com/science/article/pii/S0360131515300804

Tonéis, C. N. (2015). *A Experiência Matemática no Universo dos Jogos Digitais: O processo do jogar e o raciocínio lógico e matemático.* 160 f. Tese (Doutorado em Educação Matemática) — Universidade Anhanguera de São Paulo–UNIAN/SP, São Paulo. Retrieved from: https://www.capes.gov.br/images/stories/download/pct/2016/Teses-Premiadas/Ensino-Cristiano-Natal-Toneis.PDF

Trois, S., and Silva, R.P. da (2012). Desafiando para ensinar: estudo comparativo entre níveis de dificuldade em games educacional e comercial. In: *Brazilian Symposium on Computer Games and Digital Entertainment*, XIX. (pp. 93–99). Brasília: Sbgames. Retrieved from http://sbgames.org/sbgames2012/proceedings/papers/artedesign/AD_Full12.pdf

OBRA
revista de comunicación
DIGITAL

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

Globalization and Oral traditions: Some Remarks on Indigenous Orality in the Amazon

Globalización y tradiciones orales: algunos apuntes sobre la oralidad indígena de la Amazonía

Globalização e tradições orais: algumas observações sobre a oralidade indígena na Amazônia

2

ARTICLE

Athena Alchazidu

Masaryk University, Brno

Since 1992, she has worked as a Spanish Literature Teacher at the Department of Romance Languages and Literature at the Faculty of Arts of Masaryk University (Brno, Czech Republic). Her specialization is primarily on Spanish Contemporary Literature. She teaches Seminars and Lecture series mainly in Spanish, some of them in Czech or in English. Her research activities are focused on the following issues: Post-War Literary Tendencies in Literature; Tremendism; Contemporary Spanish Novelists: Generation X; New tendencies in Contemporary Narrative, Identity Issues reflected in Literature, etc.

athena@phil.muni.cz
orcid.org/0000-0002-3033-7398

RECEIVED: January 13, 2020 / ACCEPTED: January 20, 2020

Abstract

Indigenous orality represents an important part in the everyday life of the Ameriandian communities from the Ecuadorian Amazon region. It is important to see a symptom of serious threats in this phenomenon that can lead to the extinction of these indigenous languages. According to recent research, several languages spoken in the communities of Ecuador are considered to be in danger of extinction. Effective prevention can be promoted by academic projects focused on encouraging indigenous speakers of all generations to use the language regularly in ordinary situations. In this way, indigenous languages can become the language of instruction used in official educational institutions.

KEYWORDS

Indigenous orality, Oral traditions, Intangible cultural heritage, Indigenous communities, Amazon region.

Resumen

La oralidad indígena representa una parte importante en la vida cotidiana de las comunidades ameriandinas en la región amazónica ecuatoriana. Es importante ver en este fenómeno un síntoma de amenazas graves, que pueden conducir a la extinción de esas lenguas indígenas. Según *investigaciones recientes, se considera que varios idiomas que se hablan en las comunidades de Ecuador están en peligro de extinción. La prevención efectiva puede ser promovida por proyectos académicos enfocados en alentar a los hablantes indígenas de todas las generaciones a usar el idioma regularmente en situaciones ordinarias y los idiomas indígenas pueden convertirse en el idioma de instrucción utilizado en las instituciones educativas oficiales.*

PALABRAS CLAVE:
Oralidad indígena, Tradiciones orales, Patrimonio cultural inmaterial, Comunidades indígenas, Región amazónica.

Resumo
A oralidade indígena representa uma parte importante na vida cotidiana das comunidades ameriandinas na região da Amazônia equatoriana. É importante ver neste fenômeno um sintoma de sérias ameaças, que podem levar à extinção dessas línguas indígenas. Segundo pesquisas recentes, várias línguas faladas em comunidades no Equador são consideradas em risco de extinção. A prevenção efetiva pode ser promovida por projetos acadêmicos focados em incentivar falantes nativos de todas as gerações a usar o idioma regularmente em situações comuns e os idiomas indígenas podem se tornar o idioma de instrução usado nas instituições educacionais oficiais.

PALAVRAS-CHAVE:
Oralidade indígena, Tradições orais, Patrimônio cultural imaterial, Comunidades indígenas, Região amazônica.

1. GLOBALIZATION AND ORAL TRADITIONS: SOME REMARKS ON INDIGENOUS ORALITY IN THE AMAZON

Among the native ethnic groups that live in the Ecuadorian Amazon regions, orality keeps representing an important element that plays an irreplaceable role in the daily life of their members.

Thanks to the efforts of researchers, anthropologists, ethnographers and linguists who publish their works that comprise all genres of authentic indigenous oral traditions, there is a guaranteed and a reliable access to a wide range of plausible examples of living oral expressions and traditions that document the immense cultural diversity in the Amazon. This effort is not only important because of the results motivated by proper research objectives, but it is also very valuable seen from other, more general, perspectives related to the current situations in indigenous communities from the Amazonian regions.

As numerous recent surveys and researches show, there is a great number of indigenous languages that are in danger of extinction (Stewart, 2019), it is symptomatic that many of them are from Latin America. The alarming situation is quite obvious if we consult the Atlas of Endangered languages (UNESCO, 2017). Languages that are spoken in different parts of the world and find themselves in danger of extinction, are traced on interactive maps with all sort of relevant data. The explicatory notes include a division of those languages into six fundamental categories. The first one is defined as a safe status, while the last one is the category reserved for extinct languages. This division characterizes the safety of a language based on particular criteria: those languages that are considered endangered are divided according to the extent of the danger, which corresponds to a five-degree scale. Each degree is differentiated with one symbolic color. The first degree of danger is related to a white color and it comprises the category denominated Vulnerable. It is followed by the category of Definitely endangered languages, which is represented by a yellow color. The next degree is called Severely endangered and its color is orange. The following degree includes Critically endangered languages and is marked in red, as can be expected. The last category lists extinct languages, and that is why its color is black (ibid).

While looking at the map that documents the situation in Ecuador, we can assume that the current state is quite worrying. The registered results speak for themselves. One language is categorized as vulnerable. It is the case of Waotededo, whose speakers live in the heart of the Amazonian region. There are two cases of critically endangered languages. The first of them is Zaparo and is spoken by communities in the North of the country. The second is Sia Pedee, whose speakers live in the areas located deep in the West of the Ecuadorian Amazon region, close to the Peruvian border.

Five languages are recorded as critically endangered. Some of them are linked to communities that live in the Amazon region, as is the case of Awapit, Siona/Secoya or Shiwiar. These can serve as examples to illustrate the alarming situation related to critically endangered indigenous languages spoken on the territory of the above mentioned South American country (UNESCO, 2017). The majority of languages presented in the map are considered to be severely endangered. To be more specific, there are nine of such cases. As typical examples can be mentioned three of those languages: A´ingae/Cofan, Achuar and Shuar chicham (ibid).

In this context, it is crucial to point out the important role of Universities that try by all means to prevent the extinction of endangered languages. University academics and researchers, mainly from the Humanities fields, often combine specific research goals of projects with the struggle for conservation and preservation of indigenous languages. It is common that a language can be registered in the category with a safe status only if it is spoken by all members in the community which it is linked to, and by the youngest generations. It is not a coincidence that the criteria for considering a language as critically endangered are based on the fact that: "the youngest speakers are grandparents and older, and they speak the language partially and infrequently." (UNESCO ATLAS, 2017). As Victoria Tauli-Corpuz points out "Safeguarding living heritage is very crucial for indigenous peoples because their heritage is the basis of their identity, the basis of their cultures and, of course, it is the continuous transmission of this heritage that is going to strengthen indigenous peoples' identities and cultures" (UNESCO, ICH, 2019, p. 2).

An inherent part of the indigenous cultural heritage is represented by the diverse oral traditions that constitute one of the basic pillars of the social life in many Amerindian communities in Ecuador. The academia is aware of the dangers that jeopardize the future of the vulnerable indigenous languages, that is why there is an increasing number of projects that aim to prevent the extinction of endangered languages. The University of Azuay can be mentioned as an example worthy of imitation. From among all the university projects related to the indigenous culture, there are some focused precisely on indigenous oral expressions and traditions, where UDA professors and their students have collected examples of living oral tradition. One of such projects worth mentioning has been carried out under the supervision of Narcisa Ullauri (Torres Jara, G., Ullauri, N., and Llangui, J, 2018), senior professor who is engaged in the issues of indigenous cultural heritage. Among the outputs of this project, we can find collections of Shuar oral tradition that inspire students to pay attention to the Shuar community when preparing their thesis or academic projects.

There is another important fact that needs to be pointed out. If such collections are published, they constitute an important source of authentic material that can be studied from different perspectives and diverse disciplines. Moreover, if they are available in Spanish or English translations, the circle of potential researchers or just readers can grow. Thanks to the meticulous effort of those who take an active part in such projects, there is a plausible source with authentic study material for all those who wish to get familiarized with the particular samples of the cultural legacy of the Amerindian peoples from the Ecuadorian Amazon.

According to Carneiro da Cunha:

> There is always a double dimension in culture. One is what could be termed an internal dimension, that is its living practice, the practice of its producers and is related to its creativity. Then there is something like an external but equally fundamental dimension, which has to do with the assertion of identity of a group vis à vis other groups. (2001)

The indigenous oral traditions are important in the life of Amerindian communities not only because of its cultural dimension and identity significance, but also due to its agglutinating role in the life of the community. In this connection it should not be forgotten that the great variety of particular manifestations of indigenous orality represent an element that plays an important role in the life of the community, since the oral expressions are performed mostly as collective acts. This fact is crucial because the public performance contributes to underlining the important identity components of the community. Moreover, it is frequently repeated in order to strengthen the ties among its members. In this sense, the oral tradition not only represents the core of the indigenous culture, but a key factor with relevant social importance.

The importance attributed to the identity as one of the crucial elements in indigenous communities is also underlined in the definition of the concept of the intangible cultural heritage provided by UNESCO, where it is presented as a kind of 'living heritage' and as such it is considered "important because it offers communities and individuals a sense of identity and continuity. It can promote social cohesion, respect for cultural diversity and human creativity, as well as help communities and individuals to connect with each other." (UNESCO, ICH, 2019).

Amerindian communities from the Amazon keep their ancestral cultural heritage alive by passing it conscientiously from one generation to another. For long centuries, they have tried to conserve their knowledge in oral traditions and performances that, along with their ceremonies, rites and rituals, constitute the base of their intangible cultural heritage.

Thanks to various external factors over the past two decades, awareness and recognition of indigenous cultures in Latin America has grown slightly. This fact has contributed to an increasing appreciation of indigenous languages. Their presence at a national level is being more visible in comparison with the situation 30 years ago, due to their changing role in the society. Though the situation is far from being ideal, nowadays at schools and colleges of all education levels, from elementary schools to universities, students can get in touch with indigenous languages more frequently. It is due to the fact that in many Latin American countries there is a progressive tendency to enhance the integration processes concerning the use of indigenous languages. Therefore, they cease to be only objects of study and become representations of instructional languages. As Fajardo Salinas (2011) presents it, the notion of interculturality emerges in this context thanks to changes in the way of understanding the cultural diversity. This includes situations when indigenous languages pass from being considered a problem to being looked upon as a resource, which is complemented by the bilingualism of maintenance and development, with the proposal of a dialogic relationship between the two languages and two cultures they represent.

There is one more important aspect that should be mentioned when speaking about the possible concepts of the orality. Some scholars define orality as a pattern that:

> describes cultures or populations whose worldviews, rhetorical principles, and mental constructs develop in the absence of widespread, systematic, and habitual literacy and also refers to the coexistent or residual presence of orality in habitually literate cultures. Therefore, it is necessary to distinguish between primary orality and secondary orality. Primary orality (and thus primary oral cultures) describes cultures that privilege the spoken word as the only means of social and interpersonal communication, often lacking even a basic orthography. Secondary orality describes the presence of oral and/or pseudo-oral elements in habitually literate cultures. (Jacobsen, 2007)

In relation to the distinction of primary and secondary orality defined by Walter Ong (1996), Daniel Murillo observes an essential paradox which is related to the primary orality. On one hand, it allows memory to be activated and permits consultation of what he calls corpuses; i.e. the set of knowledge, habits, traditions, representations, symbolisms, meanings and language in a given social group (Murillo, 1999). As the author points out, it makes possible the query to an unwritten, but permanent file. On the other hand, once the words leave the mouth and are said, they also cease to exist in their acoustic form as sounds, even if the range of possibilities towards the meaning is opened. Orality is, according to Murillo, transience and permanence (ibid). It is the conjunction between the immediate and the mediate, between ancestral memory and non-memory. This double phenomenon has allowed orality to debate between the world of written culture and transform. Oral cultures exist because they have a common history, common values, a corpus and a culture; but the so-called written cultures would seem to suffer from it. It is believed that by being in books, traditions are not lost, memory is not fleeting and the corpus can be fed in different ways (Murillo, 1999).

As Juan Goytisolo (2001) states, when speaking about the antiquity of the oral heritage of Humankind, it is equally significant to pay attention to several factors that help us understand the interaction between oral traditions, written expressions and the growing imbalance that characterizes it. According to the Spanish author, only seventy-eight languages out of the three thousand languages spoken today in the world, have a living literature founded on one of the one hundred and six alphabets created throughout history. In other words, Goytisolo (2001) points out the fact that there are hundreds of languages currently used on our planet which lack writing. Consequently, the communication of their speakers is exclusively oral (Goytisolo, 2001).

Due to the impact of different factors in the contemporary globalized world, the indigenous orality is subject to permanent changes that leave a considerable mark. As a consequence, the traditional ways of oral expression pass through a process of smaller or bigger changes. Margarita Zires refers to the observations of Paul Zumthor (1987) about the tradition that is understood as an open series, indefinitely extensive in space and time, of the variable manifestations of a particular archetype. But this archetype is not conceived as a static model, since it designates a set of pre-existing virtualities that precede all textual production (cfr. Zumthor in Zires, 1999).

In this context, Gabriel Poratti (2010, pp. 99-100) points out to another effect of globalization that is reflected in the fluid cultural exchange. This process is greatly enhanced by the advent of new communication technologies, such as telephone, TV or Internet. As Poratti perceives it, the main contributions of the Internet are represented by the facts that different forms of communication have accelerated. One of the most significant consequences of such speed has been reflected in the feeling that the world has become smaller and we have reached the point where information or people are found at a simple "click" away. (Poratti, 2010, p.100)

In the long history of the humankind, there were many historical eras when the society was exposed to various radical changes. Nevertheless, none can be compared with this period in which we live with regard to the extent, depth and impacts of such changes.

"Like other forms of intangible cultural heritage, oral traditions are threatened by rapid urbanization, large-scale migration, industrialization and environmental change. Books, newspapers, magazines, radio, television and the Internet can have an especially damaging effect on oral traditions and expressions. Modern mass media may significantly alter or replace traditional forms of oral expression." (UCH, 2006)

In relation with various impacts on the oral traditions, there is another aspect worth mentioning. As Juan Goytisolo (2001) states, all cultures are based on the language, that is, on a set of spoken and heard sounds. This oral communication, which also includes numerous kinesthetic or physical elements, has experienced a series of changes over the centuries. These modifications depend on the extent of contacts with other forms of communication, transmitted at the beginning due to the existence of the writing. Knowledge of writing has gradually influenced the mentality of the rhapsody or the narrator. According to the Spanish writer, it is difficult to find depositories of an oral tradition absolutely "uncontaminated" by writing and its technological and visual support in today's world of mass media. (Goytisolo, 2001)

In the struggle for the conservation of indigenous orality as an inherent part of the intangible cultural heritage of the Amerindian people, it is vital to promote indigenous culture and encourage native speakers to use their languages actively in everyday situations. The natural and frequent use of vulnerable indigenous languages spoken by all generations in a particular community is the only effective prevention of the danger of their extinction. In this uneasy process, the academia can contribute with its own means. On one hand by encouraging the native speakers to use their language and on the other hand by making the indigenous cultural heritage accessible to the majority of society. This is the first step that can help to increase the respect and appreciation for indigenous languages and cultures.

BIBLIOGRAPHY

Carneiro da Cunha, M. (2001). *Notions of Intangible Cultural Heritage: towards a UNESCO working definition.* UNESCO.ORG. Retrieved January 6 2020 from: https://ich.unesco.org/doc/src/05357-EN.pdf

Fajardo Salinas, D. M. (2011). Educación intercultural bilingüe en Latinoamérica: un breve estado de la cuestión. *LiminaR* 9(2), 15-29. San Cristóbal de las Casas dic. 2011. Retrieved January 6, 2020 from: http://bit.ly/2sgEIGF

Goytisolo J. (2001). *Escritura y Oralidad*. International Round Table.UNESCO.ORG. Retrieved from: https://ich.unesco.org/doc/src/05360-ES.pdf

Jacobsen, M. M. (2007). Orality. *The Blackwell Encyclopedia of Sociology*. Retrieved from: http://bit.ly/2ThKeUl

Murillo, D. (1999). Especie de prefacio a comunicación y oralidad. *Razón y palabra,* 4, 15. Retrieved from: http://bit.ly/35ISY8F

Poratti, G. G. (2010). *El shock del siglo XXI. ¿Por qué el mundo va hacia una crisis? ¿Cómo haremos para salir de ella?* Buenos Aires, Editorial Red Universitaria.

Stewart, K. (2019). Indigenous Languages Are in Danger of Going Extinct. *World Politics Review.* Retrieved January 6, 2020 from: http://bit.ly/35HzVeY

Torres Jara, G., Ullauri, N., and Llangui, J. (2018) Las celebraciones andinas y fiestas populares como identidad ancestral del Ecuador. *Universidad y sociedad*, 10(2), 294-303.

United Nations Educational, Scientific and Cultural Organization, (UNESCO, 2017). Atlas of Endangered languages. UNESCO.ORG. Retrieved January 6 2020 from: http://www.unesco.org/languages-atlas/

United Nations Educational, Scientific and Cultural Organization, Intangible Cultural Heritage (UNESCO, ICH, 2019). Living Heritage and Indigenous Peoples. the convention for the safeguarding of the intangible cultural heritage. UNESCO.ORG. Retrieved January 6 2020 from: http://bit.ly/36YMwvy

United Nations Educational, Scientific and Cultural Organization, Intangible Cultural Heritage (ICH,2006). Oral traditions and expressions including language as a vehicle of the intangible cultural heritage. UNESCO.ORG. Retrieved January 6 2020 from: https://ich.unesco.org/en/oral-traditions-and-expressions-00053

Zires, M. (1999). De la voz, la letra y los signos audiovisuales en la tradición oral contemporánea en América Latina: algunas consideraciones sobre la dimensión significante de la comunicación oral. *Razón y palabra* 4(5). Retrieved from: http://bit.ly/30kAY3p

OBRA
revista de comunicación
DIGITAL

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

Culture, heritage and tourism as study fields for communication: a systematic review of recent Hispanic literature

Cultura, patrimonio y turismo como campos de estudio para la comunicación: una revisión sistemática de la literatura hispánica reciente

Cultura, patrimônio e turismo como campos de estudo da comunicação: uma revisão sistemática da literatura hispânica recente

3

ARTICLE

Valeriano Piñeiro-Naval

University of Beira Interior

Valeriano Piñeiro-Naval is an Europeus Doctor in Audiovisual Communication by the University of Salamanca. Currently, he is part of the *LabCom – Communication and Arts* of the University of Beira Interior, where he uses a national postdoctoral grant from the *Foundation for Science and Technology* (Ref. SFRH/BPD/122402/2016) of Portugal.

vale.naval@labcom.ubi.pt
orcid.org/0000-0001-9521-3364

Ricardo Morais

University of Beira Interior

Ricardo Morais is a Doctor in Communication Sciences and Master in Journalism from the University of Beira Interior, where he works as an assistant professor in the Faculty of Arts and Letters teaching the subjects of radio and television journalism. He is also an integrated member of the *LabCom – Communication and Arts*.

ricardo.morais@labcom.ubi.pt
orcid.org/0000-0001-8827-0299

RECEIVED: December 26, 2019 / ACCEPTED: January 15, 2020

Abstract

Interdisciplinary communication research with very diverse thematic interests has grown exponentially. The purpose of this study is to observe the space they occupy and how the fields of culture, heritage and tourism are addressed in the articles published in the main Hispanic communication journals during the 2013-2017 period. Methodologically, the techniques of bibliometry and meta-research were combined to address aspects such as authorship or financing of studies and identify the objects of study, theories or methodologies used in the 120 manuscripts that formed the sample.

KEYWORDS

Culture, Heritage, Tourism, Research, Communication.

Resumen

La investigación en comunicación, de naturaleza interdisciplinar y con intereses temáticos muy diversos, ha crecido exponencialmente. El propósito del estudio radica, pues, en observar qué espacio ocupan y cómo son abordados los campos de la cultura, el patrimonio y el turismo en los artículos publicados en las principales revistas hispánicas de comunicación durante el quinquenio 2013-2017. Metodológicamente, se combinaron las técnicas de la bibliometría y la meta-investigación para abordar, así, aspectos como la autoría o la financiación de los trabajos, e identificar los objetos de estudio, las teorías o las metodologías empleadas en los 120 manuscritos que conformaron la muestra.

PALABRAS CLAVE

Cultura, Patrimonio, Turismo, Investigación, Comunicación.

Resumo

A pesquisa em comunicação, de natureza interdisciplinar e com interesses temáticos muito diversos, cresceu exponencialmente. O objetivo do estudo é, portanto, observar que espaço eles ocupam e como os campos da cultura, patrimônio e turismo são abordados nos artigos publicados nas principais revistas de comunicação hispânicas durante o período de cinco anos 2013-2017. Metodologicamente, as técnicas de bibliometria e meta-pesquisa foram combinadas para abordar, também, aspectos como autoria ou financiamento de obras e identificar os objetos de estudo, teorias ou metodologias utilizadas nos 120 manuscritos que formaram a amostra.

PALARAS-CHAVE

Cultura, Patrimônio, Turismo, Pesquisa, Comunicação.

1. INTRODUCTION

In recent decades, it is possible to affirm that research in the area of communication has experienced high growth (Fernández-Quijada and Masip, 2013), especially if it is compared with other disciplines belonging to the field of social and human sciences. This development has taken place in parallel with that of the "network society" (Castells, 2006), increasingly conditioned by the "Internet galaxy" (Castells, 2001) and by the use of the Information and Communication Technologies – hereinafter, ICT – that have become the leading agents of the 21st century. In the opinion of Marinho and Vicente-Mariño (2018), the continuous and accelerated social and technological transformations have moved communication studies to a prominent place in the scientific aspect worldwide.

Another reason that motivates this circumstance lies in its interdisciplinary nature, resulting from a permanent intersection and feedback with other academic disciplines such as anthropology, economic sciences, political sciences, psychology or sociology (Pfau, 2008). In addition to highlighting its intrinsic interdisciplinary nature, it is analyzed by experts both from the perspective of integration (Wallerstein, 2005; de-la-Peza, 2013) and fragmentation (Craig, 2008; Calhoun, 2011). It is necessary to underline another very attractive characteristic that studies in this area bring together: their particular multidisciplinarity, since the potential they exhibit to be articulated with other epistemological domains is practically unlimited.

If it is true that this double nature - interdisciplinary and multidisciplinary - helps to understand the importance that scientific literature in communication has acquired, it also allows us to notice the many challenges it faces, since it can and should contribute both to the analysis and to the understanding and reflection of some of the central issues of today's society. It is in this complex scenario where this initiative is located, whose main purpose is to observe what space it occupies and how the fields of culture, heritage and tourism are addressed in the articles published in the main communication journals at the Hispanic level.

1.1 STATE OF THE ART

Although the number of studies where the association between these three fields and communication has increased, we cannot ignore the fact that this approach is, as a general rule, recent and of uneven origin. Before continuing with this brief review of the state of the art, it is clear that we do not consider delving into an exhaustive characterization of its domains. However, it is necessary to clarify that, as far as culture is concerned, it is conceived as "a set of ideas – values, attitudes, and beliefs –, practices – of cultural production – and artifacts – cultural products, texts –" (Hanitzsch, 2007, p. 369). In this context, the notion of culture has always been closer to communicative research, especially if we consider a specific sense of the term: one that explores the creation, dissemination and interpretation of messages with certain cultural meanings.

Both heritage and tourism are closely related to each other and represent newer niches for informational studies. Probably, the pioneers in watching the encounter between communication and tourism were Boyer and Viallon (1994), who pointed out the multiple labels that the tourist phenomenon presented at that time at the multidisciplinary level; among them: "idle behavior" from psychology, "consumerism" from economics, "elitism" from anthropology or sociology, "evolution of post-industrial society" from history, or "migratory phenomenon" from geography. Along these same lines, Marujo (2012) affirms that the complexity of tourism from a cultural, economic, political and social point of view exceeds the borders of a single field of knowledge, highlighting the need to deepen its communicational aspect.

It is convenient to emphasize that when we refer to any of these realities, we are referring to complex and multidimensional concepts, that is, "constructs". Regarding tourism, Osorio (2016) recalls that "types of tourism respond to different and diverse activities with respect to relationships with the environment and people (...) This makes approaching tourism as a discipline requires different methodological and theoretical tools" (p. 288). As for heritage, it allows us to discuss the links between the past and the present, providing us with historical depth in a changing world (Bessière, 1998). At the typological level, "it can be natural - relating to an environmental ecosystem -, or cultural -

pertaining to the social and human context -, and cultural heritage in turn can be tangible or intangible" (Piñeiro-Naval, Igartua and Rodríguez-de-Dios, 2018, p. 2).

This heterogeneous dimension of the notions of culture, heritage and tourism contributed to the development of academic initiatives where all three are connected. As Marujo (2015) argues, during the 1990s there was a great emergence in the observation of synergies and dysfunctions between them. This current of research materialized in the creation of specialized scientific journals, which generated "a wide bibliographic production that includes epistemological analyzes, case studies, theoretical approaches and a great critical mass that provide the basis for initiating a scientific dialogue on the relationship between tourism, culture and nature" (Osorio, 2016, p. 286).

Together, these academic coordinates allow us to warn the emergence and profusion of multiple scientific documents that deal with the interrelation between culture, heritage and tourism in the current information society. As Carvalho (2018) expresses, "the advent of new information and communication technologies expanded not only interest, mediation and dissemination of heritage, but also boosted the growth and transformation of tourism activity" (p. 28) and, we might add, cultural.

2. OBJECTIVES AND METHODOLOGY

Academic production on a subject is considered to act as a reliable symptom of the attractiveness it generates in the scientific community (Pérez-Montoro, 2016). Consequently, the goal of this project was to document the research related to the fields of culture, heritage and tourism, published during the 2013-2017 period in the main Hispanic communication journals. Based on the main purpose, the following specific objectives were raised:

- O_1: describe the production from the bibliometric point of view.
- O_2: iidentify the elements that organize this work at a theoretical and methodological level.
- O_3: compare the fields of Spanish and Latin American publication.

Two techniques such as bibliometry and meta-research were combined, "a quantitative descriptive method linked to the techniques of content analysis, specially designed to investigate how the "format" of a scientific article is organized as a means of communication and dissemination among specialized audiences" (Saperas and Carrasco-Campos, 2019, p. 222). This methodological triangulation (Denzin, 2012, 2015) allowed addressing aspects such as authorship or financing of articles – bibliometric items – and identifying the objects of study, theories or methodologies used in the publications of the sample. With what criteria was this sample designed? It was designed according to a multi-stage plan (Neuendorf, 2016) organized in different phases.

Initially, Spanish and Latin American journals with the highest impact index in 2017 were selected, these were present in the international database of *Scimago Journal & Country Rank* in the communication category[1]. It was stipulated that the journals had to appear in the first two quartiles to be considered of impact, which generated a total of 7 headers: *Comunicar, El Profesional de la Información,* Communication & Society, *Revista Latina de Comunicación Social,*

1 For more information, access the following link: http://bit.ly/2rc6ELb.

Cuadernos.info, *Comunicación y Sociedad* and, finally, *Palabra Clave*. Likewise, a five-year period was reversed until 2013 to make a cross-section with a certain chronological perspective.

Once the journals that acted as data collection units were identified, the next step consisted of downloading and storing all the documents available on the journals' websites, except for editorials and reviews. This procedure generated a total of: *N* = 1548 articles (Piñeiro-Naval and Morais, 2019). After their exhaustive examination, *n* = 120 publications were mentioned and referred to any of these fields: culture, heritage and/or tourism. A data that constituted 7.75% of the total.

2.1. ANALYSIS AND PROCEDURE VARIABLES

To undertake the objectives, an analysis procedure was designed inspired by similar empirical initiatives (Caffarel-Serra, Ortega-Mohedano and Gaitán-Moya, 2017; Goyanes, Rodríguez-Gómez and Rosique-Cedillo, 2018; López-Bonilla, Granados-Perea and López-Bonilla, 2018; Martínez-Nicolás, Saperas and Carrasco-Campos, 2019; Piñeiro-Naval and Mangana, 2018, 2019; Walter, Cody and Ball-Rokeach, 2018). The following variables were contemplated:

A total of 17 items were treated: 4 basic identification items, 5 bibliometric items and 8 analytical-operational items, whose response options will be detailed in the results section. Note that the values of items 3 and 4 were extracted as independent variables from the *Scimago Journal & Country Rank* repository, which facilitated their subsequent crossing with the data obtained here.

Finally, it should be clarified that a team of two analysts participated in the coding process, precisely the authors of this manuscript. After

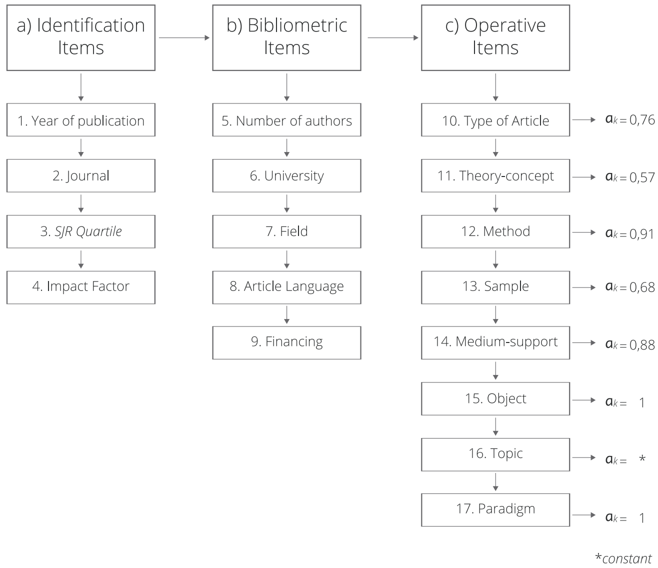

Figure 1. Scheme of the analysis items.

this process, a random subsample of 10% of the cases (*n* = 12) that both coders analyzed were selected to check the reliability of their work. The parameter used to calculate the reliability was the "Krippendorff's Alpha" (Krippendorff, 2004, 2011, 2017), found using the "macro Kalpha" (Hayes and Krippendorff, 2007) for SPSS, version 24. The average reliability of the 8 operating variables were satisfactory: $M(\alpha_k)$ = 0.83 (*SD* = 0.16), see Figure 1.

3. RESULTS

First, the timeline shown in Figure 2 reflects the annual evolution of both the average of published articles and their impact factor:

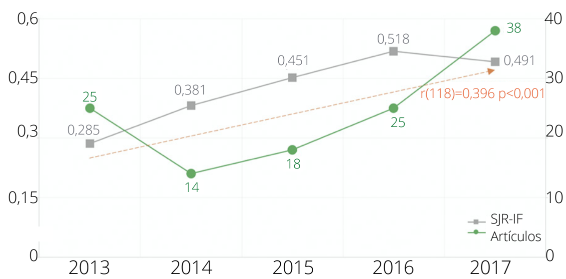

Figure 2. Timeline with the annual evaluation of the articles and their impact.

As of 2014, there is a constant increase in the number of manuscripts published annually, whose average amounts to: $M_{articles}$ = 24 (*SD* = 8.17); as well as its impact factor ($M_{SJR\text{-}IF}$ = 0.435, *SD* = 0.201). In 2017, there was a slight decrease compared to the previous year. Similarly, the correlation that occurs between both parameters is statistically significant [r (118) = 0.396, p <0.001], which shows that the more publications, the more impact academic production gets. It should also be said that this production is usually indexed in the first quartiles of the SJR ranking: 9.2% of the articles in the first quartile, 76.7% in the second, 7.5% in the third and 2.5% in the fourth. Finally, only 4.2% of the publications were not indexed in that year. The sample of 120 publications is distributed as follows according to the identified journals:

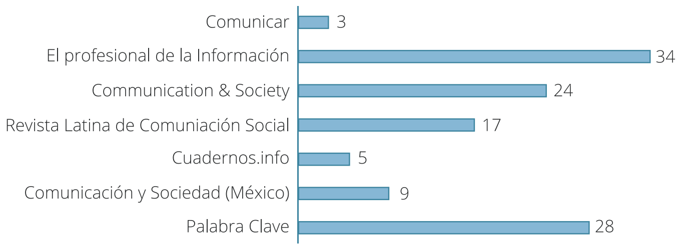

Figure 3. Number of documents according to the selected journals (frequencies).

The most active headers in the dissemination of manuscripts related to culture, heritage and tourism in the Hispanic sphere are *El Profesional de la Información* from Spain and *Palabra Clave* at the Latin American level. As regards the universities of the authors, a total of 71 were identified, among which the following stand out:

Universities	Articles
Universidad Pompeu Fabra	6
Universidad Complutense de Madrid	5
Universidad Carlos III de Madrid	4
Universidad de Santiago de Compostela	4
Universidad Rovira i Virgili	4
Universidad de Chile	3
Universidad de Navarra	3
Universidad del País Vasco	3
Universidad Internacional de La Rioja	3
Total	35

Table 1. Most prolific universities.

These 9 institutions, all of them Spanish except for one Chilean, represent only 12% of the total number of universities identified but account for 29% of the publications. If we continue to profile authorship, we find that their average amounts to: $M_{authors}$ = 1.8 (*SD* = 0.93). This data correlates with the impact factor [r (118) = 0.158, p = 0.085], although only tendentially. For this reason, it could not be asserted that a greater number of authors necessarily leads to a greater impact of the works. The field[2] to which they usually subscribe is communication (60%), followed by library and documentation (9.2%) and language and literature (8.3%). However, a lot of interdisciplinarity is perceived, as can be seen in the following table:

2 The authors' field, when not explicit, was inferred from the affiliation data to a specific department or faculty.

Field	%	Field	%
Communication	60[3]	Interdisciplinary[1]	3,3
Library and Documentation	9,2	Geography and History	2,5
Language and literature	8,3	Marketing	1,7
Advertising and Public Relations	5	Psychology	1,7
Art and Design	4,2	Education and Pedagogy	0,8
Journalism	3,3	**Total**	**100**

Table 2. Disciplines to which the authors belong

The languages in which the articles are written have the following distribution: 41.7% in Spanish, 30% in Spanish and English and 25% in English only. These data show the clear will of editors and authors to internationalize the academic production, since 55% of publications in Hispanic impact journals are available in English. From the bibliometric point of view, the latest data has to do with the extra funding of the research, present in only 33.3% of the documents. On the other hand, there is a statistically significant correlation between having extra financing and the impact factor [r (118) = 0.203, p = 0.026], this will increase as researchers have more resources for projects.

At the analytical-operational level, the publications are usually empirical (75.8%) or theoretical-essayist (20%). Proposals that focus on the explanation of a methodology barely reach 4.2%. Table 3 includes both theories and concepts and the methods used:

Theories / Concepts	%	Methods	%
Narrative-cinematic theories	14,2	Case study	25,8
Cultural Studies	9,2	Discourse Analysis	10
SCR / Branding	5	Content Analysis	6,7
Transmedia	4,2	Survey	5
Web Design Concepts	3,3	Heuristic Analysis	5
Web 2.0	3,3	Methodological Triangulation	5
Social Identity Theories	1,7	Economic analysis	4,2
Media Literacy	1,7	Bibliometric Analysis	3,3
Infotainment / Politainment	1,7	Interview	2,5
Theory of Uses and Gratifications	0,8	Automated Content Analysis	1,7
Media Ecology	0,8	Experiment	0,8
Engagement	0,8	Delphi method	0,8
Others	1,6	Others	5
Does not use theoretical framework	51,7	It is not an empirical work	24,2
Total	**100**	**Total**	**100**

Table 3. Theories, concepts and methods used (%).

3 The "interdisciplinary" category addresses cases in which there are several authors and all of them belong to fields clearly differentiated from each other.

As can be seen, the most used theories have to do with the construction of cinematographic narration (14.2%) and cultural studies (9.2%). Although it is striking that more than half of the manuscripts (51.6%) do not appeal to any kind of conceptual apparatus. On the other hand, the most recurrent methods are the case study (25.8%) and the discourse analysis (10%). If we divide them into qualitative (62.6%) and quantitative (37.4%), we immediately notice the prevalence of the first versus the second. The type of sample used in those empirical items (remember, 75.8% of the total) is commonly non-probabilistic (65.8%) versus probabilistic (10%). The main media are shown in figure 4:

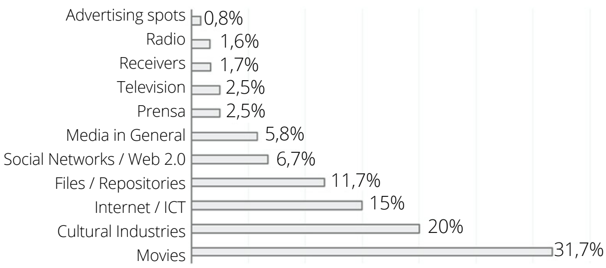

Figure 4. Media protagonists of the investigation (%)

Movies and series, as well as the rest of the cultural industries, are the most recurring media. Their total represented more than half of the documents (51.7%). The objects of study, in their broadest sense, serve the following percentage distribution:

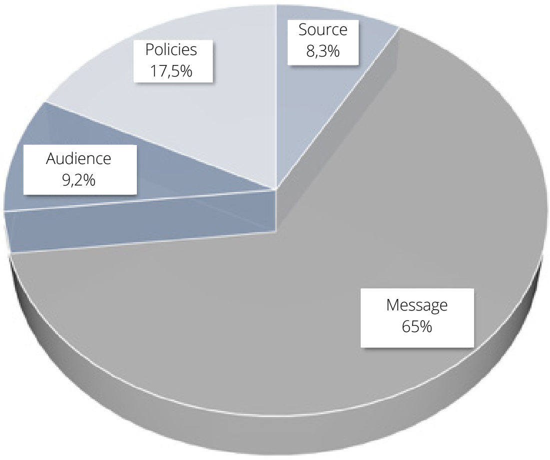

Figure 5. Study objects addressed in the publications (%)

The message (65%) is, without discussion, the protagonist of academic production versed in culture, heritage and tourism. It is followed very far by the policies (17.5%) of the communication linked to these areas. In what proportion each one of the subjects is attended? The following table shows the percentages related to these thematic domains, together with the epistemological paradigms to which the 120 publications observed adhere:

General topics	%	Paradigms	%
Culture	55	Positivist	34,2
Heritage	22,5	Cultural	33,3
Tourism	9,2	Rhetorical	24,2
Interrelation	13,3	Critical	8,3
Total	**100**	**Total**	**100**

Table 4. General topics and epistemological paradigms (%)

Culture is the subject that attracts the most attention from researchers (55%), while the positivist (34.2%) and cultural paradigm (33.3%) are practically tied. Finally, it is of great interest to outline the type of publications that are disseminated in both Spanish and Latin American journals:

Comparative Parameters	% Total	Origin of the Journals	
		Spain	Latin America
Type of publication:			
Empirical	75,8	82,1+	64,3–
Theoretical-essayists	20	12,8–	33,3+
Methodological	4,2	5,1	2,4
Theoretical-conceptual support:			
Does not have	51,7	53,8	47,6
Does have	48,3	46,2	52,4
Research Methods:[4]			
Quantitative	37,4	46,9+	14,8–
Qualitative	62,6	53,1–	85,2+
General topics:			
Culture	55	42,3–	78,6+
Heritage	22,5	32,1+	4,8–
Tourism	9,2	11,5	4,8
Interrelation	13,3	14,1	11,9
Epistemological paradigms:			
Positivist	34,2	44,9+	14,3–
Cultural	33,3	32,1	35,7
Critical	8,3	7,7	9,5
Rhetorical	24,2	15,4–	40,5+
Publication Financing:			
No financing	66,7	60,3–	78,6+
With financing	33,3	39,7+	21,4–
N	**120**	**78**	**42**

Table 5. Comparison of headers based on their geographical origin (% per column).

Note: – Statistically lower value (analysis of corrected standardized residue) + Statistically higher value (analysis of corrected standardized residue)

4 To create the "research methods" comparison variable, governed by a nominal scale where: 1 = quantitative and 2 = qualitative, the original "methods" variable that was initially governed by a multi-categorical nominal scale had to be recoded, see Table 3.

Based on the data reflected in Table 5, Spanish journals are the ones that publish the most empirical works compared to Latin Americans, most represented by theoretical-essayist proposals [χ^2 (2, N = 120) = 7.37, p = 0.025, v = 0.248]. From the point of view of the conceptual substrate, there are no statistically significant differences between the articles of some headers and others [χ^2 (1, N = 120) = 0.424, p = 0.515, v = 0.059]. At a methodological level, there is a greater use of quantitative methods in publications from Spanish journals and qualitative methods in Latin American journals [χ^2 (1, N = 120) = 8.34, p = 0.004, v = 0.303]. In turn, they usually contain a smaller proportion of studies with extra funding compared to their Spanish counterparts [χ^2 (1, N = 120) = 4.12, p = 0.042, v = 0.185]. Regarding the topics, Spanish publications generate greater production around heritage, while Latin Americans focus more on cultural issues. [χ^2 (3, N = 120) = 17.03, p < 0.001, v = 0.377]. Finally, the paradigms also show remarkable contrasts. Positivist paradigms prevail in Spanish journals and in rhetoric are more common on Latin American journals [χ^2 (3, N = 120) = 14.80, p = 0.002, v = 0.351].

Finally, the average impact factor also indicates statistically significant differences [t (118) = 9.06, p < 0.001, d = 1.78], since the 4 headers of Spain ($M_{SJR\text{-}IF}$ = 0.53, *SD* = 0.16) surpass in this aspect the 3 Latin American ($M_{SJR\text{-}IF}$ = 0.26, *SD* = 0.13); and they do it through a "high" effect size (Cohen, 1988; Johnson *et al*., 2008).

4. DISCUSSION AND CONCLUSIONS

To be more clearly interpretable, the main ideas that emerge from the data collected are described below.

At the bibliometric level, the total number of documents identified about culture, heritage and tourism amounted to 120, that is, around 8% of the total publications included in the magazines of the sample in the five years analyzed. This means a corpus that is not negligible if we stick to the multidisciplinary nature of scientific literature in communication, which causes a great thematic dispersion. The trajectory of this production is ascending, which confirms an increasing interest on the part of the academic community. This interest also translates into a high impact, although it is true that it experiences a slight setback in the last year analyzed: 2017. These considerations should be interpreted with caution because the present analysis is not longitudinal but transverse, so it would be necessary to observe a longer time period to indicate evolutionary trends more reliably. On the other hand, the universities to which the most prolific authors belong are located in Madrid and Barcelona, the two academic poles of reference at the national level. The co-authorship does not reach on average the two authors, although it is true that there is a very remarkable interdisciplinarity. According to Table 2, a dozen areas of belonging and a fairly high internationalization were identified through the use of English. There is also a lack of extra funding for these types of initiatives, an absolutely negligible aspect if we take into account the association between resources and impact: the more the first increases, the more the second will do.

From an analytical point of view, it is worth mentioning that there are many empirical works about cinema and other cultural industries, where the message is the object of the main study. The most recurrent theories have to do, precisely, with the construction and analysis of cinematographic narratives and the tradition of cultural studies. It is necessary to verify that no specific conceptual apparatus is used in more than half of the articles, which constitutes a weakness that should be corrected. The case study and discourse analysis prevail with regard to methods, that is, qualitative techniques. This causes that the samples also tend to lack probabilistic criteria for their design, since they conform more to a convenience model. Although the positivist paradigm is predominant, both cultural and rhetorical are very close to it. Likewise, culture as a general theme is reaffirmed in its position of primacy with respect to heritage and tourism. Recall that in this sense, it was already anticipated in the section of the state of the art that culture has always been closer to communicative research than the other two domains.

In addition to outlining a global portrait of scientific production, another objective was to establish comparisons. Spanish magazines, among which *El Profesional de la Información* stands out, publish more manuscripts on audiovisual heritage, museum archives and digital humanities. They are mostly empirical and positivist, where quantitative methods prevail. These investigations that exhibit a high impact index also tend to have extra funding with greater assiduity. Latin American magazines, among which *Palabra Clave* stands out, refer more to issues related to cultural industries and multicultural movements. They rely on the rhetorical or the qualitative empirical paradigm for the approach to publications of a theoretical-essayist profile. These documents have a lower impact index compared to their Spanish counterparts and a lower trend of additional financing.

Finally, it is necessary to insist on the inter and multidisciplinary nature of communication research. The variety of approaches and thematic richness are, without doubt, two strengths of this type of publications. However, it would be convenient for them to appeal to more robust theories or concepts. At the methodological level, it would be interesting to explore quantitative techniques, especially if we look at the particularities that digital society entails from the perspective of (hyper) abundance of data. These can be studied thanks to techniques such as automated content analysis or network analysis. It would also be important to analyze the capital role that users play in the current media world, whose peculiarities are observable thanks to surveys or experiments. This would cause the message and the receiver to share the protagonism in a more balanced way and, consequently, that diversity remains the predominant note in the field of communication, intimately related to culture, heritage and tourism. de la comunicación, íntimamente relacionado con la cultura, el patrimonio y el turismo.

ACKNOWLEDGMENTS

This work is part of a project funded by the *Foundation for Science and Technology* (Ref. nº: SFRH/BPD/122402/2016) of Portugal.

REFERENCES

Bessière, J. (1998). Local development and heritage: traditional food and cuisine as tourist attractions in rural areas. *Sociologia Ruralis*, 38(1), 21-34. doi:10.1111/1467-9523.00061

Boyer, M., and Viallon, P. (1994). *La communication touristique*. Paris: Presses universitaires de France.

Caffarel-Serra, C., Ortega-Mohedano, F., and Gaitán-Moya, J. A. (2017). Investigación en Comunicación en la universidad española en el periodo 2007-2014. *El Profesional de la Información*, 26(2), 218-227. doi:10.3145/epi.2017.mar.08

Carvalho, P. (2018). Património, Turismo e Sociedade Digital: Teoria e Aplicação. In V. Piñeiro-Naval & P. Serra (Eds.), *Cultura, Património e Turismo na Sociedade Digital: Uma perspetiva ibérica* (pp. 21-48). Covilhã: Editora LabCom.IFP.

Castells, M. (2001). La *Galaxia Internet.* Barcelona: Areté.

Castells, M. (2006). Informacionalismo, redes y sociedad red: una propuesta teórica. In M. Castells (Ed.), *La Sociedad Red: una visión global* (pp. 27-75). Madrid: Alianza Editorial.

Calhoun, C. (2011). Communication as social science (and more). *International Journal of Communication*, 5, pp. 1479-1496.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed.). Hillsdale, New Jersey: Lawrence Earlbaum.

Craig, R. T. (2008). Communication as a field and discipline. In W. Donsbach (Ed.), *The International Encyclopedia of Communication* (pp. 675-688). Nueva York: Blackwell. doi:10.1002/9781405186407.wbiecc074

de-la-Peza, M. C. (2013). Los estudios de comunicación: disciplina o indisciplina. *Comunicación y Sociedad*, 20, pp. 11-32.

Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research,* 6(2), 80-88. doi:10.1177/1558689812437186

Denzin, N. K. (2015). Triangulation. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology*. Wiley & Sons. doi:10.1002/9781405165518.wbeost050.pub2

Fernández-Quijada, D., and Masip, P. (2013). Tres décadas de investigación española en comunicación: hacia la mayoría de edad. *Comunicar*, 21(41), pp. 15-24. doi:10.3916/C41-2013-01

Goyanes, M., Rodríguez-Gómez, E. F., and Rosique-Cedillo, G. (2018). Investigación en comunicación en revistas científicas en España (2005-2015): De disquisiciones teóricas a investigación basada en evidencias. *El Profesional de la Información,* 27(6), 1281-1291. doi:10.3145/epi.2018.nov.11

Hanitzsch, T. (2007). Deconstructing Journalism Culture: Toward a Universal Theory. *Communication Theory*, 17(4), pp. 367-385. doi:10.1111/j.1468-2885.2007.00303.x

Hayes, A. F., and Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures,* 1(1), 77-89. doi:10.1080/19312450709336664

Johnson, B. T., Scott-Sheldon, L. A. J., Snyder, L. B., Noar, S. M., and Huedo-Medina, T. B. (2008). Contemporary approaches to meta-analysis in communication research. In A. F. Hayes, M. D. Slater, & L. B. Snyder (Eds.), *The SAGE Sourcebook of Advanced Data Analysis Methods for Communication Research* (pp. 311-347). Thousand Oaks, California: Sage.

Krippendorff, K. (2004). Reliability in content analysis. Some common misconceptions and recommendations. *Human Communication Research,* 30(3), 411-433. doi:10.1111/j.1468-2958.2004.tb00738.x

Krippendorff, K. (2011). Agreement and information in the reliability of coding. *Communication Methods and Measures*, 5(2), 93-112. doi:10.1080/19312458.2011.568376

Krippendorff, K. (2017). Reliability. In J. Matthes, C.S. Davis y R.F. Potter (Eds.), *The International Encyclopedia of Communication Research Methods.* Wiley & Sons. doi:10.1002/9781118901731.iecrm0210

López-Bonilla, J. M., Granados-Perea, C., and López-Bonilla, L. M. (2018). Autores prolíficos líderes en la investigación turística española. *Transinformação*, 30(1), pp. 39-50. doi:10.1590/2318-08892018000100004

Marinho, S., and Vicente-Mariño, M. (2018). Uma paisagem da Epistemologia e Metodologia em Comunicação. *Comunicação e Sociedade*, 33, pp. 7-14. doi:10.17231/comsoc.33(2018).2903

Martínez-Nicolás, M., Saperas, E., and Carrasco-Campos, Á. (2019). La investigación sobre comunicación en España en los últimos 25 años (1990-2014). Objetos de estudio y métodos aplicados en los trabajos publicados en revistas españolas especializadas. *Empiria*, 42, 37-69. doi:10.5944/empiria.42.2019.23250

Marujo, N. (2012). Comunicação, Destinos Turísticos e Formação Superior. En S. Sebastião y R. Ribeiro (Eds.), Portugal: Destino a Comunicar. *A Comunicação no Turismo Português* (pp. 74-88). Lisboa: ISCSP-CAPP.

Marujo, N. (2015). O Estudo Académico do Turismo Cultural. TURyDES, *Revista de Turismo e Desarrollo Local*, 8(18), pp. 1-18.

Neuendorf, K. A. (2016). *The content analysis guidebook* (2nd Ed.). Thousand Oaks, California: Sage.

Osorio, J. (2016). La aventura del turismo: resinificando la cultura a través del turismo y el patrimonio. *International Journal of Scientific Management Tourism,* 2(2), 285-295.

Pérez-Montoro, M. (2016). Gestión del conocimiento: orígenes y evolución. *El Profesional de la Información*, 25(4), 526-534. doi:10.3145/epi.2016.jul.02

Pfau, M. (2008). Epistemological and Disciplinary Intersections. *Journal of Communication,* 58(4), pp. 597-602. doi:10.1111/j.1460-2466.2008.00414.x

Piñeiro-Naval, V., Igartua, J. J., and Rodríguez-de-Dios, I. (2018). Implicaciones identitarias en la divulgación del patrimonio cultural a través de Internet: un estudio desde la Teoría del Framing. *Communication & Society*, 31(1), 1-21. doi:10.15581/003.31.1.1-21

Piñeiro-Naval, V., and Mangana, R. (2018). Teoría del encuadre: Panorámica conceptual y estado del arte en el contexto hispano. *Estudios sobre el Mensaje Periodístico*, 24(2), 1541-1557. doi:10.5209/ESMP.62233

Piñeiro-Naval, V., and Mangana, R. (2019). La presencia del framing en los artículos publicados en revistas hispanoamericanas de comunicación indexadas en Scopus. *Palabra Clave,* 22(1), e2216. doi:10.5294/pacla.2019.22.1.6

Piñeiro-Naval, V., and Morais, R. (2019). Estudio de la producción académica sobre comunicación en España e Hispanoamérica. *Comunicar,* 27(61), 113-123. doi:10.3916/C61-2019-10

Saperas, E., and Carrasco-Campos, Á. (2019). ¿Cómo investigamos la comunicación? La meta-investigación como método para el estudio de las prácticas de investigación en los artículos publicados en revistas científicas. In F. Sierra Caballero & J. Alberich Pascual (Eds.), *Epistemología de la comunicación y cultura digital: retos emergentes* (pp. 217-230). Granada: Editorial Universidad de Granada.

Wallerstein, I. (2005). *Las incertidumbres del saber.* Barcelona: Gedisa Editorial.

Walter, N., Cody, M. J., y Ball-Rokeach, S. J. (2018). The Ebb and Flow of Communication Research: Seven Decades of Publication Trends and Research Priorities. *Journal of Communication,* 68(2), 424-440. doi:10.1093/joc/jqx015

The representation of women as a cultural historical subject in two literary works: *No me agarran viva* by Claribel Alegría and Darwin J. Flakoll and *La mujer habitada* by Gioconda Belli

La representación de la mujer como sujeto histórico cultural en dos obras literarias: No me agarran viva, de Claribel Alegría y Darwin J. Flakoll; y La mujer habitada, de Gioconda Belli

A representação da mulher como sujeito histórico cultural em duas obras literárias: No me agarran viva, de Claribel Alegría e Darwin J. Flakoll; e La mujer habitada, de Gioconda Belli

4

ARTICLE

Karen Julissa Barahona Posada

Baldwin Wallace University

Karen Barahona is an Assistant Professor of Spanish at Baldwin Wallace University. Her area of expertise is Latin American literature of the 20th-21st centuries with a focus on studies of testimony, gender, identity, memory and revolution in women's fiction. Whether in the classroom or directing research projects, Karen's work is infused with her goal of promoting the experiences of unheard and non-dominant individuals and groups in Latin America. She is the recipient of the 2017-2018 Baldwin Wallace Excellence in Community Engagement Faculty Award and the 2019 *Comunidad Oscar Arnulfo Romero* Peace Mission Saint Romero Solidarity Award.

kbarahon@bw.edu
orcid.org/0000-0001-7955-5540

RECEIVED: January 11, 2020 / ACCEPTED: January 19, 2020

Abstract

The revolutions of the 1970s and 1980s in Nicaragua and El Salvador put an end to the era of military dictatorships. Consequently, women redefined their political identity through revolutionary participation. Gioconda Belli reflected the Sandinismo in her works and marks the role of Nicaraguan women during the revolution in *La mujer habitada* (1998). In the same way, Claribel Alegría represented the Salvadoran revolutionary woman in her testimonial novel *No me agarran viva* (1983). The purpose of this work is to demonstrate how the literary works rewrite history to vindicate women as historical subjects in Nicaragua and El Salvador.

KEYWORDS

Political identity, Subjectivity, Sandinista revolution.

Resumen

En Nicaragua y El Salvador las revoluciones de los años setenta y ochenta pusieron fin a la era de dictaduras militares, la mujer redefine su identidad política mediante la participación revolucionaria.

Gioconda Belli reflejó el sandinismo en sus obras, y en La mujer habitada (1998) marca el papel de la nicaragüense durante la revolución. De la misma manera, Claribel Alegría representó la mujer revolucionaria salvadoreña en su novela testimonial No me agarran viva (1983). El propósito de este trabajo es demostrar como las obras reescriben la historia para reivindicar a la mujer como sujeto histórico en Nicaragua y El Salvador.

PALABRAS CLAVE

Identidad política, Subjetividad, Revolución Sandinista.

Resumo

Na Nicarágua e El Salvador, as revoluções das décadas de 1970 e 1980 encerraram a era das ditaduras militares, as mulheres redefinem sua identidade política por meio da participação revolucionária. Gioconda Belli abordou o sandinismo em suas obras e, em La mujer habitada (1998), marca o papel da nicaraguense durante a revolução. Do mesmo modo, Claribel Alegría representou a mulher revolucionária salvadorenha em seu romance No me agarran viva (1983). O objetivo deste trabalho é demonstrar como as obras reescrevem a história para reivindicar as mulheres como sujeitos históricos na Nicarágua e El Salvador.

PALAVRAS-CHAVE

Identidade política, Subjetividade, Revolução Sandinista.

1. INTRODUCTION

Given the Nicaraguan prominence in the revolutionary plight of the seventies, Gioconda Belli and Claribel Alegría dedicated themselves to writing about the Central American revolutionary movements. On one hand, Belli had participated with the FSLN (*Frente Sandinista de Liberación Nacional*) in the overthrow of the Somoza dictatorship and her work had contributed to issues of love, sexuality, politics and revolution. On the other hand, the author Claribel Alegría (from El Salvador) had written about the revolutionary struggle of the FMNL (*Frente Farabundo Martí de Liberación Nacional*).

In the same way, Alegría's literary involvement in the process of seeking subjectivity of Central American women was determined by two sociopolitical factors: political discourses of revolutionary power and patriarchal society. Belli's militancy in the FMNL and Alegría's contributions form a literary trajectory that must be analyzed to fulfill its purpose of remembering the heroic work of men and women who gave their lives for the liberation of Nicaragua and El Salvador (Merril, 1993). This study provides insight into the process of seeking women's identity as a historical subject parallel to national liberation projects and contextualized in the two testimonial literary works: *No me agarran viva* (1983) y *La mujer habitada* (1998).

To explain the contribution of specific functions of testimonial discourses towards the construction of a national and individual identity, this research analyzes the testimonial functions of the denunciation of the categorization of women as "the other" of Linda Craft (1997), the representation of women in the novels of Laura Barbas-Rhoden (2003) and the reconstruction of the narrative by Margaret Randall (1994) in order to demonstrate how the literary works rewrite history to vindicate women as historical subjects for their revolutionary participation.

1.1. THE REPRESENTATION OF WOMEN AS A HISTORICAL AND CULTURAL SUBJECT

Central American authors Gioconda Belli and Claribel Alegría have feminized in their work the revolutionary struggle of the seventies and eighties in Nicaragua and El Salvador based on the testimonial function of the denunciation of the categorization of women as the Other (Bosé y Acosta, 1995). Linda Craft in Novels of Testimony and Resistance from Central America (1997), comments that the primary function of the testimonial discourse is the otherness produced by and for the Others. Central American writers such as Sergio Ramírez, Arturo Arias, Manlio Argueta, Gioconda Belli and Claribel Alegría responded to the political situation of their countries with testimonial novels and testimonies in an effort to rewrite history. Defined by Craft: "the Other in Central America includes women, political prisoners, homosexuals and the poor, as well as indigenous peoples" (1997, p. 52). To explain the contribution of the specific role of otherness in testimonial discourses, this work shows how the literary works *No me agarran viva*: The Salvadoran woman in struggle (1983) by Alegría and *La mujer habitada* (1988) by Belli, rewrite the struggle of guerrilla women to represent their search for historical subjectivity.

In the seventies and eighties of the twentieth century, Central American women went through profound social and political changes, they went from a military dictatorship to socialism and then to Catholic neo-liberalism. These changes led women to explore their subjectivity and set new goals of equality as a citizen in society to define their political identity (Beverley y Zimmerman, 1990). Each government had its own ideology about the role of women in society and implemented it according to their ideology. Therefore, women needed to redefine themselves for each change of government, producing new leaders, forms and understandings in their organizations. Given the situation of socio-political adaptation of women, sociologist Maxime Molyneux in Women's Movements in International Perspective: Latin America and Beyond (2003), points out that:

> This raises an important question about the relationship between socialist revolution and women's emancipation. For if women surrender their specific interests in the universal struggle for a different society, at what point are these interests rehabilitated and responded to by the revolutionary forces or by the new socialist state? (p. 40)

For example, women fought alongside men in Nicaragua for the overthrow of the Somoza dynasty. With the triumph of the Sandinista Revolution, a 36-year dictatorship ended, which gave way to the involvement of women in politics, the workforce and community service. But when the objectives had been achieved and the armed struggle ended, the result was a political destitution (and subsequent disillusionment) of women, they returned to their home, family and maternal activities. Which brings us to the question: how is this problem reflected in Central American literature?

Alegría and Belli react with a narrative of resistance to sociopolitical issues in texts that have continued a revolution "short of armed struggle in which the traditionally disenfranchised can educate, 'conscientize', persuade, and rally in order to cause changes" (Craft, 1997, p. 28). Barbas-Rhoden comments that:

> Like the Boom novels, the narratives, of historical fiction by Alegría and Belli actively engage the turbulent past of Latin America .... Unlike them, they are woman-centered .... They unmask

> the nineteenth-century narratives of liberal progress and paternalistic conservatism and reveal hidden motives in the shaping of modern nations. (2003, p. 14)

As a result, Belli and Alegría's novels confront the official discourse to criticize power discourses and, through fiction, continue the revolutionary struggle of women that was discontinued in the wake of triumph: "Decolonial literature-meaning not only anticolonial writing but that which makes a conscious move away from or out of colonialism -and culture today are attempting to gain the liberation that was never won" (Craft, 1997, p. 28). The two problems in their works are the revolutionary struggle of women and national liberation. The writers take up the history of their countries to reflect conflicts of revolution and question political leadership in Nicaragua with the Sandinista revolution and the civil war of 1981-1992 in El Salvador:

> In the retelling of history Alegría and Belli challenge the accepted order of life in the isthmus. They also question the logic that justifies that order. They expose the politics behind divisions such as elite/popular, and literature/orality, and they bring into focus gendered dichotomies like public/private, passive/active, desired/desiring, which have been inscribed in the story of the past. (Barbas-Rhoden, 2003, p. 2)

Barbas-Rhoden (2003), clarifies that the texts written by women suffered from distribution deficiency, and that the advantage of the testimony was the reprimand caused by the Reagan administration. This administration issued the call of attention for sponsoring funds for the Contras, whose military operations consisted of terrorist attacks on civilian populations and caused abuses that violated the human rights of the inhabitants of those areas due to the destruction of agricultural plantations, health centers, schools, power generating plants and industrial plants (Lancaster, 1992). This problem is reflected in the novels of Belli and Alegría, respectively.

Likewise, the contributions of journalist Margaret Randall have served to contextualize the use of memory in the testimony. She has done several studies, such as *Walking to the edge: essays of resistance* (1991) and *Sandino's Daughters. Testimonies of Nicaraguan Women in Struggle* (1994), in which she compiles and analyzes testimonies of Nicaraguan women who fought in Sandinismo. In addition, she emphasizes the use of memory in testimonial discourse as an important element for women:

> And memory is vital. It occupied a new, almost sacred, place in our writing; in our poetry, prose, essays, journalistic efforts. Even in our images; photography and other visual art forms. We came to understand how a retrieval of our own memory was essential, not simply for the language of our lives, but for the very meaning of that language, the nurturing of life itself. And so, we gave thought to ways in which we might uncover, discover, recreate the memories of those whose voices we passed on. It was not a matter of remembering more. It was a matter of remembering differently, unfettered by what men have deemed worthy of recording, unaltered by male interpretation, uncluttered by the male system of rewards of achievement according to their values. (Randall, 1994, p. 71)

Randall argues about the use of memory as the act of remembering that it occupies an important place in women's writing, since it constructs discourses that challenge and detach themselves from patriarchy and rewrites the history of women as historical subjects. With the emergence of testimony, this element begins to be used as we see in Belli and Alegría, not only to remember but also to recreate the memory of the revolutionary struggle and of what could have been.

In this environment of political changes, the socialist revolution sought the participation of women and entered into relations with interests that differed: on one hand the woman had the interest to emancipate herself and on the other the revolution wanted to consolidate power. Randall's process of "uncover, discover, recreate the memories of those whose voices we passed on" applied to the novels of Belli and Alegría resulted in texts as "memorials to the future" to rewrite the revolutionary participation of women and find out at what point the interests of women in the Sandinista revolution were considered and how they are reflected in the works.

1.2. *NO ME AGARRAN VIVA* (1983)

From the narrative point of view, both works represent "the other" in the guerrilla woman. They sought a political identity to reveal their participation as a historical subject and show the extent to which the Sandinista revolution considered women's interests as a collective. In *No me agarran viva*, the author states in the prologue that the life of Eugenia is "exemplary model of self-denial, sacrifice and revolutionary heroism, is a typical and not exceptional case of many Salvadoran women who have dedicated their efforts and even their lives to fight for the liberation of his people" (Alegría, 1983, p. 7).

The story of the protagonist Eugenia is based on the life of Ana María Castillo Rivas, a commander of the Popular Liberation Forces in El Salvador during the civil war of 1981-1992. In this work, the revolutionary functions and challenges of Eugenia in motherhood and family are portrayed. This work gives voice to many other fallen combatants, who also served in the political-military organizations of El Salvador and defined their identity in the revolutionary leadership.

On the other hand, in *La mujer habitada*, we see the Nicaraguan community of the late sixties and early eighties represented in the triumph of the Sandinista Revolution. Belli portrays the Nicaraguan community preparing to overthrow the Somoza dictatorship and the woman starting in politics, which had been the exclusive terrain of men until that time. The novel reflects the beginning of a woman's involvement in a revolutionary heyday in the country, with hopes based on the promises of the revolution to consider women's interests, to improve the situation of subordination and general injustice to which they were subjected (Preble-Niemi, 2003).

As a result, it can be concluded that the two literary works show a long and slow process of raising women's awareness within a strongly patriarchal society. From their military and political participation, they rewrite history to vindicate women as historical subjects through their revolutionary participation.

In *No me agarran viva*, Alegría recreates the revolutionary history of women through the life of Eugenia not only as a revolutionary combatant, but also as a wife and a mother, combining the two roles of militancy and motherhood (Salgado, 2003).

As for the format of the novel that includes the elements of narrative, testimony and interview, this work provides information about Eugenia that she can no longer give us but her family, friends and companions in the battle testify for her and mark the extent of the struggle of a nation. As Laura Barbas-Rhoden comments in *Writing Women in Central America* (2003), the novel offers "multiple interpretations of the identity of a Eugenia, including commentary by those who knew her as a student, daughter, revolutionary, wife, mother and leader" (2003, p. 36). Like Lavinia, Eugenia exercises the national commitment to the revolutionary struggle but its challenges have to do with being a mother and wife.

Eugenia observes her surroundings, realizes that her country was going through a problem and thinks that she should contribute to solving it: "From the first moment she could clearly see that work had to lead to armed struggle" (Alegría, 1983, p. 41). In one of her missions, she increased her sensitivity due to the injustice and the misery she saw, also accompanied by the entire racial issue in relation to the natives. Lavinia also focuses on the great concern to solve the root problem and wonders:

> Why do our people live in this situation of injustice? Why do our people have to endure exploitation? She begins to think about that contradiction between the rich and the poor, between the exploiters and the exploited, between the oppressors and the oppressed. She begins to realize that no one can solve the problem if it is not the people themselves. (Alegría, 1983, p. 28)

This conflict leads her to think that she must fight first for her country. This process defines her political subjectivity as a desire that is complemented by her main cause: the people.

Regarding the role of women in the revolution, Commander Eugenia considered that "in capitalism the woman was crushed, raped, usurped, and the only expectation she had to become a woman was to join the struggle for a new society, a socialist society. The liberation of women goes along with the socialist triumph" (Alegría, 1983, p. 85). Regarding the Salvadoran revolutionary participation, Eugenia comments that women were given greater support to develop in the struggle:

> From the beginning in the statutes, and not only in the statutes but in practice, the "Popular Liberation Forces" have always advocated the participation of women in the revolution, and specifically in the organization. Not to use women only as a collaborator, but as a combatant, as a leader. (Alegría, 1983, p. 80)

Through the revolutionary participation of women, the Popular Liberation Forces begin to break the existing strong gender barriers by allowing them to hold various positions, some of considerable importance, and resolve the situation of freedom in their country.

Eugenia's first challenge as a revolutionary was found in motherhood, when she becomes pregnant and the doctor recommends a month of rest but her "work spirit and the understanding of her tasks made her look for all possible ways not to abandon them. She said that her pregnancy, despite the dangers, could not remove her from her duties, that she had to combine the problems of pregnancy with the problems of war" (Alegría, 1983, p. 87).

Additionally, Eugenia comments on her role as a mother, her longing in motherhood and her experience with her militant companions. It was a community in which they supported each other with the care of children in case of absence for their revolutionary functions. For example, when Commander Eugenia had her daughter, Ana Patricia, and with the war Eugenia's responsibilities had tripled, she spent less time with her daughter and the farewells were sad (Alegría, 1983, p. 13). It was impossible for her to maintain a daily relationship with her daughter in daily life. Many times her revolutionary activities forced her to ask for help from other partners, generally leaving her in the hands of the "aunts" of the organization, which came to be the title of the companions who lent themselves to care for the children of other women.

The second challenge that Eugenia faced was to serve as commander and wife at the same time. Their marriage relationship was affected, since she did not spend time with Javier, her husband. They were together for seven years, four of living in hiding. The last time Eugenia had seen him, she could only spend two and a half hours with him. Eugenia was also the head of the Services Department of the General Staff of the Front (Alegría, 1983, p. 14), so Javier took care of their daughter when she went on missions. As for motherhood, Eugenia says that:

> It is not contradictory to be a mother. The comrades are formed in such a way that they even say, well, I am going to leave my son in the hands of my comrade while I complete my tasks. There have been cases in which we found a comrade struggling changing diapers, but he considers it as an obligation. We can't sweep machismo overnight, but it's disappearing. (Alegría, 1983, p. 8)

Likewise, we cannot hide the fact that not all men could or were willing to complement their revolutionary activities with the responsibilities of housework, the undesirable domestic tasks that many prefer to ignore. Each case was different, but we will not delve into the issue of machismo here. However, it is interesting to see how Eugenia and others like her faced this challenge by committing their husbands to assume parental responsibilities in order to maintain their marital relationship and political identity.

1.3. *LA MUJER HABITADA* (1988)

La mujer habitada (1988) is Belli's first novel that marks a series of orphan protagonists, outside the patriarchal line and in search of their subjectivity. In Belli's narrative, the protagonists face their lack of cultural or biological antecedents and establish a connection with their indigenous past or with the memory of their mothers. On this, Barbas-Rhoden, in *Writing Women in Central America*, notes that:

> All of Belli's narratives share a concern with coming of age and are stories of limitations, rebellion and a quest for identity and subjectivity. And despite the differences among Belli's fiction, there is one recurring narrative throughout: the confrontation of women of their lack of history and their search for empowerment through a connection with their past. (2003, p. 49)

This process of connection with the past is repeated in the protagonists throughout the novels and is caused by the absence of a cultural or biological background in order to get out of the marginalization crisis.

The novel unfolds the story of Lavinia and Itzá and the parallel of their revolutionary struggles. Itzá inhabits symbolically in the orange tree of the house of Lavinia. When the fruits are born, Lavinia drinks their juice and Itzá enters her. In the context of the novel, Itzá was an indigenous woman who fought and resisted during the Spanish conquest. Once Itzá inhabits Lavinia's veins, it gives her strength and impels her to continue the revolutionary struggle of her ancestors. Both protagonists have abandoned their parents to start an independent life and reject the passivity of women around them. In her union with Itzá, Lavinia begins her identity search process and her revolutionary participation on a Sunday breakfast morning. The story of the Itzá and Yarince couple and their struggles in the Spanish conquest serves Lavinia as an inspiration to fight against every obstacle in her relationship with Felipe. Belli makes Lavinia constitute her political identity remembering a past shared by a collective (the indigenous struggle of the Spanish conquest). To fill her cultural emptiness and have a historical purpose, she seeks to get involved in the revolution (in the same way that Itzá did when she sought the struggle in the conquest).

In *La mujer habitada* we can see the revolutionary participation of women and the start of the process of a revolutionary heyday that begins to erase gender boundaries. Lavinia begins a path in revolutionary participation as a historical commitment and is proud to be an active participant in a national liberation project. To acquire the national commitment to join the revolutionary struggle, she follows certain steps in search of her historical subjectivity, which consist of observing her surroundings, exploring her subjectivity and defining her political identity.

Lavinia is marginalized because of her gender and has to resist against the discourses of power in the labor, political and social aspects. She faces differences with the men around her and this leads her into the dilemma of deciding whether to follow the patriarchal discourse or not. As a first step, Lavinia decides to observe the men around her and imitate them, or see if the differences in particular will help her. In her observation, Lavinia recognizes the areas of affectivity, authority and responsibility and grants the last two to men. This reflects the social belief that men have spent more time practicing them and that women have been raised and trained to be emotional and not exercise authority. With this practice of observing the attitudes of men and the power they exercise, she begins to explore her own subjectivity.

As a second step, Lavinia self-analyzes and explores her subjectivity. She realizes her passive life without historical purpose and decides to change course. Her friend Flor shares her national commitment and giving her brochures of the revolution she says: “Now you will have to learn them by heart - she added - as a school lesson. At first they will sound exaggerated, extreme and strange precautions, but they are essential, not only for your own safety but for everyone's. Today begins your time to replace the "I" with the "we" (Belli, 1998, p. 143). This message from Flor symbolizes the desire of the revolution to join forces and overthrow the dictatorship.

Finally, Lavinia defines her political identity by joining the front. Her life now has revolutionary purpose and every area of her life is oriented and focused to support the national liberation project. As part of this project, Lavinia was assigned to lead a mission to replace her boyfriend Felipe, who dies suddenly. Felipe's death has two important meanings: 1. Demonstrate the need for the participation of women in the revolution, which criticizes the revolutionary agenda governed by men and 2. The beginning of a process of revolutionary participation that Lavinia has been looking for. As a result, Belli reconstructs the participation of women in the revolution in the novel and determines it as a historical subject. Although there is a claim in the novel by granting women their roles in politics, the hierarchy established by the patriarchy remains. This action reflects the revolutionary agenda governed by men and the hierarchy of power between the two, in which he commands. The death of Lavinia at the end of the novel symbolizes the permanence of women in the struggle, represented by the union of the sap of the orange tree where Itzá is and the blood of Lavinia when she is buried at the foot of the tree. By joining these two elements, Lavinia does not die, but survives when her blood is reborn in nature, mixed with the sap.

2. CONCLUSION

Belli and Alegría relate the revolutionary struggle in Nicaragua and El Salvador in the seventies and eighties of the twentieth century. Both reacted with a narrative of resistance to the socio-political problems of their countries. Their works arise as a result of the context of social oppression and revolutionary struggle. In the attempt to share common themes in the works of Belli and Alegría, we can conclude that both confront the discourses of power to continue the revolutionary struggle of women through fiction. The writers take up the history of their countries to reflect the conflicts of women in the revolution and to question the political leadership in Nicaragua with the Sandinista revolution and the civil war of 1981-1992 in El Salvador. The atmosphere of disillusionment and political destitution of women was the backdrop for these writers to criticize the patriarchal revolutionary leadership and raise a dialogue before the challenge of women to participate in the revolution as a national identity project.

The questions that arise from this study that may represent an extension to the analysis of the search for political identity of women and their role in the revolution and society are: What remains the social and political struggle of women who wanted a revolution? How is the process of resistance without violence associated with the revolution in the narrative? What are the struggles of women in Belli's current works? What narrative path has she taken in her recent works?

The search for revolutionary identity of women in Central America has been a process in moments of peace, resistance, violence and death. Literature is a gateway to understand these social and political processes of women in revolutions. The literary analysis of the testimonial function can contribute to the studies of Central American literature with an innovation linked to revolutionary socialist governments, the role of women in them and a critical evaluation of their participation, even in times of disillusionment.

REFERENCES

Alegría, C. (1983). *No me agarran viva: la mujer salvadoreña en lucha*. México, D.F., México: Ediciones Era.

Barbas-Rhoden, L. (2003). *Writing Women in Central America: Gender and the Fictionalization of History.* Athens, OH, United States: Ohio UP.

Belli, G. (1998). *La mujer habitada*. Barcelona, España: Emecé.

Beverley, J. and Zimmerman, M. (1990). *Literature and Politics in the Central American Revolutions*. Austin, United States: University of Texas Press.

Bosé, C. E. and Acosta, E. (1995). *Women in the Latin American Development Process.* Philadelphia, United States: Temple University Press.

Craft, L. J. (1997). *Novels of Testimony and Resistance from Central America.* Gainesville, United States: UP of Florida.

Lancaster, R. (1992). *Life is hard, Machismo, Danger, and the Intimacy of Power in Nicaragua*. Berkeley / Los Angeles / Oxford, United States, Gran Bretaña: University of California Press.

Merrill, T. (1993). *Nicaragua: A Country Study*. Washington, D.C., United States: GPO for the Library of Congress.

Molyneux, M. (2003). *Women's movements in international perspective: Latin America and beyond.* London, Gran Bretaña: Institute of Latin American Studies.

Preble-Niemi, O. (2003). Gioconda Belli. In G. Group, *Dictionary of Literary Biography*.Modern Latin- American Fiction Writers (pp. 26-33). Chapel Hill, United States: Gale Group.

Randall, M. (1994). *Sandino's daughters revisited: feminism in Nicaragua*. New Brunswick, United States: Rutgers University Press.

Salgado, M. A. (2003). Claribel Aleg. In G. Group, *Dictionary of Literary Biography* Modern Spanish American Poets (pp. 10-6). Chapel Hill, United States: Gale Group.

Notes on gender, technology and videogames

Apuntes sobre género, tecnología y videojuegos

Notas sobre gênero, tecnologia e videogames

5

ARTICLE

Renata Jéssica Galdino

Pontifical Catholic University of Campinas (PUC-Campinas)

Master in Languages, Media and Art from the PUC-Campinas. Degree in Advertising and Propaganda from the Paulista University.

rejgaldino@gmail.com
orcid.org/0000-0003-3111-2737

Tarcisio Torres Silva

Pontifical Catholic University of Campinas (PUC-Campinas)

Full-time research professor at PUC-Campinas. Member of the teaching staff of the Master in Languages, Media and Art. Graduated in Social Sciences from the University of São Paulo (2001) and graduated of Social Communication with an emphasis on Advertising and Propaganda at the Superior School of Propaganda and Marketing (1998). He has a Masters in Arts (2008) from the State University of Campinas and a PhD in Visual Arts (2013) from the same university. He completed a PhD internship at the Department of Cultural Studies at Goldsmiths, University of London (2011).

tartorres@gmail.com
orcid.org/0000-0001-9347-7585

RECEIVED: December 18, 2019 / ACCEPTED: January 27, 2020

Abstract

In this article, the digital gaps generated by gender hierarchies that affect the way in which women develop, disseminate and appropriate technologies are investigated. For this, some relationships between gender and technology were shown to bring the universe of games closer. Then comes a redemption of the concept of games as a "boys thing", to show how this technology gradually distanced itself from the world of girls. Today, the reverse path is being taken by a new generation of women who create initiatives for the appropriation of games in Brazil and around the world.

KEYWORDS

Video games, Gender, Technology, Feminism, Woman.

Resumo

Neste trabalho, buscamos investigar as brechas digitais geradas pelas hierarquias de gênero que afetam a maneira como as tecnologias são desenvolvidas, difundidas e apropriadas pelas mulheres. Para tanto, mostramos algumas relações entre gênero e tecnologia a fim de fazermos a aproximação com o universo dos games. Segue então um resgate da concepção dos games como "coisa de menino", de forma a mostrar como essa tecnologia foi aos poucos sendo distanciada do mundo das meninas. Hoje, o caminho inverso vem sendo feito por uma nova geração de mulheres que criam iniciativas para se apropriar dos games no Brasil e no mundo.

PALAVRAS-CHAVE

Videogames, Gênero, Tecnologia, Feminismo, Mulher.

Resumen

En este documento, buscamos investigar las brechas digitales generadas por las jerarquías de género que afectan la forma en que las mujeres desarrollan, difunden y se apropian de las tecnologías. Para hacerlo, mostramos algunas relaciones entre género y tecnología para acercarnos al universo de los juegos. Luego viene una redención del concepto de juegos como "cosa de niños", para mostrar cómo esta tecnología se fue distanciando gradualmente del mundo de las niñas. Hoy, el camino inverso lo está tomando una nueva generación de mujeres que crean iniciativas para juegos apropiados en Brasil y en todo el mundo.

PALABRAS CLAVE

Videojuegos, Género, Tecnología, Feminismo, Mujer.

1. INTRODUCTION

Science and technology boasted a supposed neutrality for a long time, as if their construction and maintenance were not based on the hierarchy of subjects according to their social class, gender, ethnicity, race, etc. The traditional subject of science is the hegemonic subject, subject of colonialism, white, European, heteronormative and belonging to privileged social classes (Freitas *et al*., 2017).

This scenario is gradually changing, motivated by feminist agendas and gender studies, black studies, indigenous studies, among others. These studies seek to show that science and technology are part of a structure of power relations based on an androcentric patriarchal society in addition to not being neutral constructions (Freitas *et al*., 2017).

Historically, the discussion on the "gender" category has involved diverse perspectives and discussions among researchers, which leads to this field of study having different approaches and lines of thought. More than a category based on physiological elements, gender must be understood as a cultural form of classification, part of a relational and hierarchical system that makes distinctions based on symbolic violence. Beyond the dichotomies man/woman, female/male, is an abstract category that aims to "explain and deconstruct differentiations based on social perceptions of sex, body, culture" (Natansohn, 2014, p. 5).

This study is guided by the perspective defended by researcher Linda Nicholson. In her article "Interpreting gender", she leads the reader to think of the biological body as something complex that must be analyzed within a history and a culture, from a variable perspective, not constant. The author warns about the dangers of thinking that gender depends on the biological body, which would contribute to the exclusion of those who differ from normative heterosexuality, based on binary male/female opposition (Nicholson, 2000).

To think about the category of women, it is necessary to abandon the female/male dichotomy, understanding it as a complex network of interlocking characteristics (Nicholson, 2000). The author draws on Ludwig Wittgenstein's ideas about language, to argue that the meaning of the word woman should not be defined by means of a characteristic or set of them, but, based on a complex network of characteristics, with different elements present in different cases.

> Therefore, I suggest thinking of the meaning of "woman" as being able to illustrate the map of similarities and differences that intersect. In this map the body does not disappear, it becomes a historically specific variable whose meaning and importance are recognized as potentially different in changing historical contexts. (Nicholson, 2000, p. 36)

The philosopher and researcher Judith Butler (2018) corroborates what Nicholson mentions, by abandoning the idea of an exact definition for the "women" category, which she says would only reinforce the male/female binarism of a heterosexual matrix. The author, in her book "Gender problems", tests the category of the subject by arguing that it is a performative construction. Therefore, the word woman "in itself is a term in process, a becoming, a construction that cannot legitimately be said to have an origin or an end" (p. 69).

Therefore, "woman" is considered as this complex network of intersecting characteristics, a constant construction with no fixed definition. In other words, the meaning of women is not limited to a specific physical, social or psychological characteristic, nor to a set of them, but to the network of attributes that allow mapping similarities and recognizing differences in these issues.

In this analysis, we seek to understand the games from the perspective of "gender technologies", a term coined by the writer Teresa De Lauretis that refers to the discursive techniques and strategies with which specific gender relations are constructed (De Lauretis, 1994). This perspective resembles that of Pereira (2009). As the author mentions, gender is not a property of bodies, that is, something natural for human beings but a set of effects "produced on bodies, behaviors and social relations" (p. 486).

For the author, the genre is the product of different social technologies such as television, cinema, press, internet and also games. Therefore, gender is not the property of bodies, but a set of effects produced in them.

Throughout this work, the focus will be on gender issues, aimed at the experience of women in the virtual context and especially digital games. It is important to reinforce that gender in this research is not synonymous of women. The central issues addressed throughout this research are identified as women, but in this conception there is a multiplicity of identities created discursively that articulate to reason, geographical origin, social class, cultural context, sexual orientation, among others in addition to gender.

The concept of intersectionality, coined academically by African-American Kimberlé Crenshaw in 1989, allows us to see the overlays of gender, race and class and defines the position of black feminism against the idea of a global white and hegemonic feminism. Although the term became popular in the academic context from the 2000s, its origin is linked to the black feminist movement of the 1970s, known as black feminism. She sought to criticize the hegemony of white, European, heterosexual and middle class feminism. "Intersectionality is seen as one of the ways to combat multiple and interrelated oppression and, therefore, as an instrument of political struggle" (Hirata, 2014, p. 69).

1.1. THE TECHNOLOGICAL GAP OF GENDER

Historically, productive work has been assigned to the male gender, reserving for women the functions of satisfying basic needs and social welfare, essentially linked to the problems of care and reproduction. If in the past they were linked exclusively to functions such as taking care of the house, educating children and engaging in handicraft activities, even today these stereotypes reproduce with the feminine image strongly related to care functions, being mostly linked to areas such as nursing, human resources, communication, education, etc.

> Female exclusion from scientific and technological practice was guided by scientific discourses, which postulated based on biological determinations that women would be less able to produce science and technology. More recent studies point to concerns about this hegemonic, androcentric and sexist universe in science and technology. (Freitas *et al*., 2017, p. 4)

In general terms, gender studies in science and technology indicate that this knowledge was instituted based on male epistemological and philosophical bases. Science was built by men for men. Not by a biological determinism that justifies the elimination of women from these areas, but by a construction designed to maintain male privileges over the androcentric hegemonic context of science.

The concept of supposed biological determinism was strongly used to perpetuate the idea that women have lower capacities than men in certain areas, including science, technology and games. A wrong concept that completely ignores the social context in which the subject is inserted (Nicholson, 2000). The elimination of women from technology is not based on biological factors, but on a technological gender gap.

This gap refers not only to the obstacles women face in accessing Information and Communication Technologies (ICTs), but also involves social dimensions of how gender operates hierarchically in the design, distribution and appropriation of technologies by the female gender (Natansohn, 2013).

If you look at the history of great technological advances, it is possible to identify two factors. First, the technology has been designed, molded and disseminated by white men in the academy and in the military industrial complex. Second, when women somehow manage to close this gap that segregates gender participation in technology, there is a historical and systematic elimination of female performance, such as the fact that Ada Lovelace[1] and Hedy Lamarr[2] are important names in technology and go unnoticed for most people.

> What we learn from the history of the internet is that it was engineered, implemented, programmed, and spread by white men in academia and the military-industrial complex. Despite the fact that the earliest computer programmers were actually women, the creators of ARPANET and the earliest desk-sized computers were educated white men with ties to research institutions and the government, spaces which have historically been associated with white male authority and privilege. (Bezio, 2018)

In the book "Internet in feminine code: theories and practices", author Graciela Natansohn (2013) uses the example of the experience of children in dismantling their toys to illustrate what she calls "binary, hierarchical and highly unfavorable technological habitats for girls" (p. 17).

According to the author, children are encouraged to disarm and (try) to reassemble their toys in an exercise of fundamental creative curiosity in making technology, while girls in the same situation of disarming their dolls are scolded and discouraged, encouraged to show zeal and responsibility for their belongings and pushed to the work of care, social welfare and reproduction.

1 Ada Lovelace (1815-1852), math and English writer, created the first algorithm to be processed by a machine. She is considered the first woman programmer in all history.

2 Hedy Lamarr (1914-2000), actress and inventor, created a communications system for the US Armed Forces which served as the basis for the invention of Wi-Fi and the cell phone.

Cassell and Jenkins present data in the 1998 book "From Barbie to Mortal Kombat: gender in computer games", which corroborate Natansohn's vision. The authors investigate the American context of player culture in the 1990s and discuss gender relations in computer games based on cultural references, values and attributions to games according to the gender of children.

For them, the imaginary that the female gender has no interest in digital games is not due to the supposed biological determinism, but to the fact that men dominate access to the computer, excluding women from the scene.

The authors cite a study conducted with preschoolers in which boys appropriated computers, limiting girls' access. The lower exposure of girls to computers and games was reflected in their lack of interest in them. However, after the mediation of the teachers, guaranteeing equal access for children, both had a similar interest in games (Cassell and Jenkins, 1998).

Several factors directly affect this "technological gender fracture" such as: literacy (after all it is necessary to read and write to use technological resources), computer education, basic knowledge of the English language (as it predominates in software, websites and devices technology), economic resources to buy and pay for access, production and dissemination of useful content for women and opportunities for female insertion in science and technology development contexts (Alonso, 2007 quoted by Natansohn, 2013).

Natansohn (2013) lists three types of digital gender gaps: The ability to access networks, people's use of technology and the place of women in production and technological governance.

By bringing this perspective to the games, the technology gap is quite symptomatic, so it is possible to observe the three types of digital divide:

a) **The ability to access networks:** The data shows that the female gender appropriates mobile games more easily, that is, games for mobile devices such as smartphones and tablets; while men dominate the spectrum of consoles and computers (Sioux Group *et al*, 2019). The figures also indicate that the use of the Internet through mobile devices in Brazil is the same between genders, with 74% of men[3] and 75% of women claiming to have used the Internet on their cell phones in the last three months. In relation to the computer, 63% of men have used a computer, while only 58% of women have used it. One of the explanations for this phenomenon is that the popularization of smartphones and prepaid Internet plans allow greater female access to these devices. Most mobile games can be played offline, they do not necessarily depend on mobile Internet or Wi-Fi to function, which requires fewer financial resources and allows women to access these games.

b) **The use that people give to technology:** Mobile games are considered "casual" games, they are hardly taken to professional level competitions, they have little or no publicity and do not grant their players the status of "gamers". These games are marginalized in the dominant culture of video games, considered less relevant or even as "women" games.

c) **The place of women in production and technological governance:** According to data from the 2018 Census in Brazil, women represent only 20.7% of the workforce among partners and employees of game production companies (Sakuda and Fortim, 2018). If the analysis by area of activity within the industry is observed, this gap is even greater. The female gender is concentrated in marketing, sales and administration activities, representing only 10.8% in areas directly related to technological creation, such as programming and project management.

The examples above illustrate how the gender digital divide marginalizes the participation of women in the experience of digital games. More than entertainment platforms, games can be considered the first and probably the most attractive way to introduce children to the technological universe.

The experience with digital games opens a door to the interest and appropriation of the technology field since childhood, with direct implications in the way in which power relations based on the gender hierarchy are perpetuated in the field of science and the technology. The way in which this digital divide has been consolidated since the beginning of the gaming industry is what will be discussed next.

1.2. AFTER ALL, ARE VIDEO GAMES A BOY'S THING?

The perception that games are a "boy's thing" is deeply rooted in society, based on the belief in a supposed biological determinism by which the male gender would have more interest and aptitude for digital games. However, if the brief history of video games is observed, it is clear that this masculine hegemony is due to the fact that the scientific structure, technological structure and the base of the gaming industry

3 The 2018 ICT Household Survey does not include gender, only sex.

is based on patriarchal and androcentric power relations.

The first video games emerged in 1952, from the computerized version of *TicTac Toe or Tic Tac Toe*, programmed by Alexander Douglas at the University of Cambridge. In 1958, William Higinbotham produced an oscilloscope version of PingPong at the Brookhaven National Laboratory of the US Department of Energy. And finally in 1962, Spacewar was born, the first computer game that was not a digitized version of another game and was developed by a team of MIT researchers led by Steve Russell (Bezio, 2018).

What the creation of these games has in common is that, like the Internet, their developers (and consequently the players) were highly educated white men who worked in the academy or in the military and industrial complex of England or the United States. As a result, the games created in the 1970s and 1980s, which ended up perpetuating to this day, are in large numbers narratives centered on male figures of soldiers, adventurers, cyborgs and criminals.

Despite this scenario, the 1970s marked the beginning of a period of female ascent to the media and the labor market. Not by chance, the first video game consoles began to be sold as entertainment for the whole family during this period, regardless of age and sex among the public, similar to the strategy used to market devices such as television or radio, for example.

Figure 1 illustrates the strategy used by the Atari company to announce the Atari 2600 console, launched in the United States in 1977 and available in Brazil in 1983. It is noted that the console calls itself "The No.1 enemy of the Brazilian family", referring to a family activity in which the father, mother and children fight together and without distinction with the various villains present in the games.

During the 1980s, the video game industry faced a sharp drop in sales due to the financial crisis in the United States and the strong competition from Japanese companies whose products were beginning to reach the US market. At that time, the Japanese company "Nintendo" chose to reposition video games as male toys. This was a more stable demand sector compared to the appliance market, which in times of crisis was seen by consumers as a superfluous good.

Figure 2 presents a sequence of images taken from the first television commercial[4] made for the Nintendo NES console, launched in 1983 in Japan and available in the United States in 1985. In the video, a boy and a young white man play enthusiastically accompanied by the robot Rob, an element that accompanies the game.

This strategy proved effective for a while and was followed by other companies in the industry. Since then, video games have begun to target young and male audiences (Blanco, 2017). The 1998 data show that the audience of players was 80% male in this period (Bezio, 2018). Another element that can have a great influence on the low female adherence to games is related to recreational machines, game machines available in public spaces or in specialized sales houses.

Arcades were very popular in the United States during the 1980s. They were known as game rooms, operated with coins or tokens and were responsible for popularizing video games among the public that still had no access to domestic consoles. However, these places had a dubious reputation, as they were constantly compared to slot machines controlled largely

4 The full video of the ad can be seen in: https://www.youtube.com/watch?v=IU1-ncmPiJk. Accessed on: Mar 23, 2019.

Figure 1. Ad of the Atari 2600 console. Source: REIS JR., 2019.

by the mafia, which removed the female audience (Donovan, 2010, cited by Blanco, 2017).

The social structure based on misogynistic precepts prevented girls from attending these places, pushing them into occupations such as playing with dolls or doing domestic activities while boys had fun and got used to the challenges of games, which according to several studies, have the potential to contribute to the development of logical reasoning (McGonigal, 2017). "Gaming might help develop confidence and skills in using digital technologies, leading to an increased interest and aptitude for careers in computer science and other fields that heavily rely on such technologies" (Hayes, 2007, p. 23).

Tōru Iwatani, creator of Pac-Man, seems to have noticed this distance of women from recreational rooms and claims to have developed this game with the aim of attracting the female

Figure 2. Television commercial for the launch of the Nintendo NES in 1985 in the USA. Source: adapted from Retro Games Fan, [undated].

audience to these spaces. To create the character, Iwatani would have associated the image of women with food and, inspired by a pizza, ended up creating one of the most emblematic characters of video games (Blanco, 2017).

Despite the great success of Pac-Man, it was only in the early 1990s that the industry identified the opportunity to invest in the female audience, motivated by factors such as market saturation, the introduction of the CD-ROM and discussions on the gender gap in the area of technology (Cassell and Jenkins, 2011). These factors culminated with the launch of the *Barbie Fashion Designer* game, produced by Mattel in 1996. This explored the Barbie doll brand, quite established among the female audience, and had the advantage of being a computer game that was marketed without the user having the need to buy a specific console. This point is very relevant, given the direction of "male products" that the video game industry had given to the consoles during the previous decade.

The Barbie game begins a movement called *Pink Games*, following the stereotype that girls are only interested in clothes, makeup, beauty and activities considered "homelike" (Cassell and Jenkins, 2011).

The so-called *Pink Games* ended up reinforcing the figure of women in objectified and sexist positions. In opposition to this perspective, The *Girls Games Movement* sought to provide joint practices between technology developers, researchers in the field of gender studies and activists of feminist movements in the production of games that gave less emphasis to the aspects of "femininity" of the *Pink Games* and sought to build narratives that valued the experience of women in digital games.

In 1995, Theresa Duncan and Mônica Gesue launched the game *ChopSuey*, an interactive story of two adventurous girls, fans of Chinese food. This game opens an alternative trend to the *Pink Games* with games also aimed at the female audience. It focused on issues of socialization, conflict resolution and reproduction of situations experienced by girls aged 8 to 12 years. These games, which would be known as *Purple Games*, were developed primarily by producer *PurpleMoon* (Blanco, 2017).

Figure 3. Cover of the Barbie Fashion Designer game CD, Mattel, 1996. Source: Barbie, [Undated].

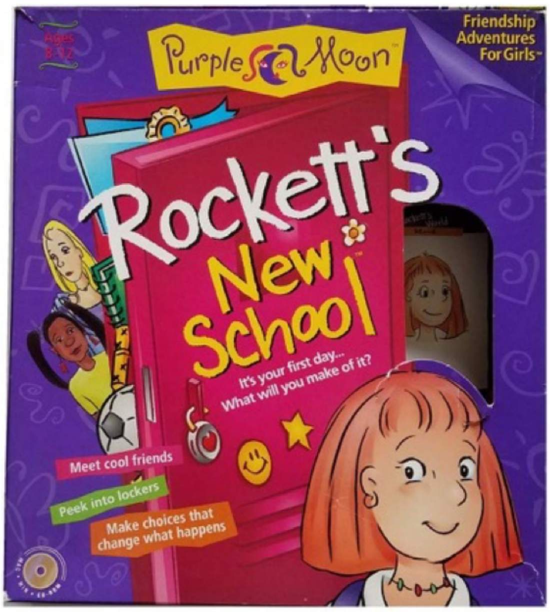

Figure 4. Cover of Rockett's New School by PurpleMoon (1997). Source: Rockett's New School, [Undated].

Despite escaping the femininity stereotype based on clothing, makeup and housework, the *Purple Games* were based on the idea that women would naturally be more sociable and conciliatory than men. Thus, both cases are based on a supposed femininity established on the binary opposition male/female.

The thinking behind the Purple Games is based on a feminist perspective called "differentialist" or even "essentialist", marked by struggles for the affirmation of differences and identity that considered genital sex as a differentiator in relation to men, and therefore, builders of a female identity. This perspective was intensely criticized by authors such as Butler (2018), Nicholson (2000) and Scott (1989), who, among their specificities, approach gender as a social and cultural construction, the effect of discursive representations.

The case study recorded in the article *Gender identities at play: case studies of two women playing Morrowind* by Hayes (2007), corroborates the aforementioned authors in criticizing what she defines as limited conceptions of the nature of gender and its manifestation in the behaviors and self-perception of people in relation to the way in which the market and part of the academy identifies the supposed female preferences in relation to games. For the author, the stereotype that female players prefer casual and collaborative games with a focus on social interactions, while male players opt for competitive and combat games does not reflect the multiple layers by which individuals build their identity, such as class, race, personal history and cultural factors that differ in each other's life.

An example were the *Grrrl Gamers*, women who in the 1990s escaped the stereotyped standard of *Pink Games* and opted for games considered "masculine", which caused their presence and ability to be recognized in that space. These women did not look for their own segment within the games, but instead claimed their representativeness in all types of games, turning virtual arenas into true territories of resistance.

The Girls Games Movement began to lose strength in the late 1990s, but its seed was planted in the fertile ground of games that were going through a rising stage, driven by the advancement of technology in the development of consoles and personal computers (PC) along with the popularization of broadband Internet.

In this context, the female community continued to occupy spaces that represented 46% of the global gaming audience in 2018 (Newzoo, 2019). In Brazil, women represent a majority among those who play digital games in the last three years and in 2018 they represent a majority among the general public of games (Sioux Group *et al*., 2019).

Due to this scenario of rapid female insertion into the universe of gamers, the movements that seek to give greater visibility to women in the scene and protect them from constant attacks against their presence in the games, have been growing and solidifying, which helps in the search for greater gender equity in this environment.

2. CONCLUSIONS

Unlike a certain "naturalization" that can be considered when it comes to gender differences to access games, we try to demonstrate in this work that the imbalance in today's gaming market is a reflection of both the historical context of the induced distance of women's access to technology and the decision of the gaming industry to direct their efforts towards a male audience, from a certain moment.

When looking at the literature, the academy's interest in investigating how female representativeness in games grew in the last decade is evident, as well as the experience of women in the context of electronic games due to the advancement of female participation in the community of gamers and the demand for equal opportunities in the competitive professional scenario of the games.

The struggle of female players for space and recognition is resisted by the community that interprets the emergence of women as an invasion of a space previously reserved for the expression of masculinity anchored in violence and virility. However, this resistance has been fought through women's groups and projects that seek to ensure female appropriation of the game scene.

What we tried to show here was the origin of these fields of tension built from the relations between gender and technology, in which gender operates as a hierarchical element that has negatively influenced women's access to this field of knowledge.

BIBLIOGRAPHY

Bezio, K. Ms. (2018). Ctrl-Alt-Del: GamerGate as a precursor to the rise of the alt-right. *Leadership,* 14(5), 556–566. doi:10.1177/1742715018793744

Blanco, B. (2017). Games para mulheres: do Girls Game Movement ao pós Gamergate. *In Anais do Congresso Intercom - Sociedade Brasileira De Estudos Interdisciplinares Da Comunicação.* Curitiba: Intercom. Retrieved from: http://portalintercom.org.br/anais/nacional2017/resumos/R12-0280-1.pdf

Butler, J. P. (2018). *Problemas de gênero: feminismo e subversão da identidade* (16. ed.). Rio de Janeiro: Civilização Brasileira.

Cassell, J. and Jenkins, H. (2011). From Quake Grrls to Desperate Housewives: A Decade of Gender and Computer Games. In: Kafai, Y. B., Jenkins, H. (Eds.). *Beyond Barbie to Mortal Kombat – New Perspectives on Gender and Gaming.* Cambridge, Massachusetts London: MIT Press.

Cassell, J. and Jenkins, H. (1998). *From Barbie to Mortal Kombat: gender and computer games.* 1. ed. Cambridge, Mass.: MIT Press. Retrieved from: https://archive.org/details/frombarbietomort00cass#maincontent

De Lauretis, T. (1994). A tecnologia do gênero. In: *Tendências e impasses: o feminismo como crítica da cultura*. Rio de Janeiro: Rocco, 206–242.

Freitas, L. B. *et al*. (2017). Gênero, Ciência e Tecnologia: estado da arte a partir de periódicos de gênero. *Cadernos Pagu,* 49. doi:10.1590/18094449201700490008.

Hayes, E. (2007). Gendered Identities at Play: Case Studies of Two Women Playing Morrowind. *Games and Culture*, 2(1), 23–48. doi:10.1177/1555412006294768

Hirata, H. (2014). Gênero, classe e raça Interseccionalidade e consubstancialidade das relações sociais. *Tempo Social,* 26(1), 61–73. doi:10.1590/S0103-20702014000100005

McGonigal, J. (2017). *A realidade em jogo.* Rio de Janeiro: Editora Best Seller.

Natansohn, G. (2014). Mulheres e uso das TIC, algumas reflexões metodológicas. In *Anais do Intercom - Sociedade Brasileira De Estudos Interdisciplinares Da Comunicação.* Foz do Iguaçu: Intercom. Retrieved from: http://gigaufba.net/wp-content/uploads/2014/09/Mulheres-USO-TIC-Intercom2014Natansohn2014.pdf

Natansohn, G. (Ed.) (2013). *Internet em código feminino*. Teorias e práticas. (1. ed.). Buenos Aires: La Crujía. Retrieved from: http://gigaufba.net/internet-em-codigo-feminino/

Newzoo. (2019). *Newzoo's Gamer Segmentation*. Retrieved from: https://resources.newzoo.com/hubfs/Newzoo_Gamer_Segmentation.pdf

Nicholson, L. (2000). Interpretando o gênero. *Revista Estudos Feministas,* 8(2), 9-42. doi:10.1590/%25x

Pereira, P. P. G. (2009). Violence and technologies of gender: time and space in the newspaper. *Revista Estudos Feministas,* 17(2), 485–505.

Sakuda, L. O. and Fortim, I. (Eds.) (2018). *II Censo da Industria Brasileira de Jogos Digitais*. Brasília: Ministério da Cultura. Retrieved from: https://nuvem.cultura.gov.br/index.php/s/mdxtGP2QSYO7VMz#pdfviewer

Scott, J. (1989). Gênero: uma categoria útil de análise histórica. *Gender and the politics of history*, 20(2), 35, 1989.

Sioux Group *et al*. (2019). *Pesquisa Game Brasil 2019*. São Paulo: Sioux Group. Retrieved from: https://www.pesquisagamebrasil.com.br/

IMAGE SOURCES

1. Reis Jr., D. (2019). *Atari Polyvox - 1978 Propagandas Históricas | Propagandas Antigas.* Retrieved from: https://www.propagandashistoricas.com.br/2013/02/atari-polyvox-1978.html

2. *Original Nintendo NES Commercial First TV Ad 1985*. [s.d.]. Direção: RETRO GAMES FAN. Retrieved from: https://www.youtube.com/watch?v=IU1-ncmPiJk

3. *Barbie Fashion Designer* (1996) Windows box cover art. [s.d.]. Retrieved from: https://www.mobygames.com/game/windows/barbie-fashion-designer/cover-art/gameCoverId,87484/

4. *Rockett's New School.* [s.d.]. Retrieved from: https://purplemoon.fandom.com/wiki/Rockett%27s_New_School

OBRA
revista de comunicación
DIGITAL

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

Innovation conceived as resistance in Design: a twist in the concept in contrast to the guidelines of the Oslo Manual

La innovación pensada como resistencia en el diseño: un giro en el concepto en contraste con las directrices del Manual de Oslo

Inovação pensada como resistência no Design: uma torção no conceito em contraste com as diretrizes do Manual de Oslo

6

ARTICLE

Cecilia Oliveira Boanova

IFSUL

Doctor of Education from the Federal University of Pelotas in the doctoral program of Education in the Curriculum, Professionalization and Teaching. Master for the same program in the research line of culture, writing, languages and learning. Graduated in Arts with a degree in Drawing and Graphic Computing. Specialist in digital graphics, all degrees are from the Federal University of Pelotas. She is a professor at the Federal Institute of Education, Science and Technology Sul-rio-grandense in the city of Pelotas-RS in the following courses: Associate degree in Visual Communication, associate degree in Interior Design, Bachelor of Design and the Lato Sensu graduate program in education in the line of teaching and teacher training. Among the topics investigated are: creation, creativity, innovation, sustainable design, graphic design and education with philosophies of difference.

ceciliaboanova@gmail.com
orcid.org/0000-0001-6005-2433

Raquel Paiva Godinho

IFSUL

Dr. Raquel Paiva Godinho is a professor and researcher in the Design Department of the Federal Institute of Education, Science and Technology Sul-rio-grandense (IFSul), Brazil. She is currently a member of the Balmes Foundation team involved in an H2020 project at the University of Vic - Central University of Catalonia (UVic-UCC) of Spain. Her current research interests include design, communities and collaboration.

raquelpg@pelotas.ifsul.edu.br
orcid.org/0000-0003-3968-7519

RECEIVED: January 13, 2020 / ACCEPTED: January 30, 2020

Abstract

This article aims to explore the concept of innovation through a design case, The Shoe that Grows. It is a type of sandal for children of adjustable size designed to adapt to children living in extreme poverty. The case attracts attention because it meets a human need and uses design and business strategies to democratize access to footwear. Through a study of the literature and taking the Oslo manual as its main contribution, there was a shift in the concept of innovation that can be understood as criticism, which leads the concept to expand.

KEYWORDS

Innovation, Education, Design, Oslo Manual, Market.

Resumen

Este artículo tiene como objetivo explorar el concepto de innovación a través de un caso de Diseño, The Shoe that Grows, un tipo de sandalia para niños de tamaño ajustable diseñada para adaptarse a los niños que viven en la pobreza extrema. El caso llama la atención porque primero satisface una necesidad humana y utiliza estrategias de diseño y negocios para democratizar el acceso al calzado. A través de un estudio de la literatura, tomando el manual de Oslo como su principal contribución, presentamos un giro en el concepto de innovación que puede entenderse como una crítica, lo que lleva al concepto a expandirse.

PALABRAS CLAVE

Inovación, Educación, Diseño, Manual de Oslo, Mercado.

Resumo

Este artigo visa explorar o conceito de inovação através de um caso da área do Design, The Shoe that Grows, um tipo de sandália infantil de tamanho ajustável projetado com intuito de calçar crianças vivendo em situação de extrema pobreza. O caso chama atenção por atender primeiro a uma necessidade do humano e usa o Design e as estratégias de negócio para democratizar o acesso à calçados. Por meio de um estudo da literatura, tomando como principal aporte o manual de Oslo, apresentamos uma torção no conceito de inovação que pode ser entendida como uma crítica, que o faça ampliar.

PALAVRAS-CHAVE

Inovação, Educação, Design, Manual de Oslo, Mercado.

---

1. INTRODUCTION

This text arises in the middle of an investigation that aimed to explore the theme of creation and innovation in design education (Boanova, 2019). The latter is seen as the creator of a strategic problem-solving process that drives innovation and is responsible for linking it with technology, research, businesses and customers, while adding new value and a competitive advantage between the economic, social and environmental spheres. Concern for design education that trains innovative professionals joins the judgments that education remains obsolete compared to market models (Melo and Abelheira, 2015). However, it is necessary to carefully consider and understand: What mobilizes education and the market? What are their policies? And who has the greatest resilience in defense of human life beyond the product life cycle?

Therefore, the objective of the study was to understand the concept of innovation from a case of design, The Shoe that Grows. It is a type of adjustable size sandal designed to fit children living in extreme poverty. From this, there was a confrontation with the literature and the guidelines of innovation according to the indications formulated by the OSLO Manual[1] . The confrontation resulted in a conceptual twist that can be understood as a review, whose objective is to allow the expansion and enhancement of the potential of the concept of innovation.

1.1. DESIGN, INNOVATION AND MARKET

Thinking about forms of innovation in design requires attention to explore the complexities of market systems in their engagement with customers, suppliers, consumers, among others. Design is a word with multiple entries, so it becomes relevant to bring the expectations and definitions of two organizations:

> Design is a dynamic and constantly evolving discipline. The professionally trained designer applies to the intention of creating visual, material, spatial and digital environments, aware of the experience and using interdisciplinary and hybrid approaches to design theory and practice. He understands the cultural, ethical, social, economic and ecological impact of his efforts and his ultimate responsibility with people and the planet through commercial and non-commercial spheres. A designer respects the ethics of the design profession (ico-D, 2015). International Council of Design. Ratified by the General Assembly of Icograda 25, Montreal, Canada, October 18, 2013.

The definition of the *International Council of Societies of Industrial Design* (ICSID) uses the term industrial design.

> Industrial design is a strategic problem-solving process that drives innovation, generates business success and leads to a better quality of life through innovative products, systems, services and experiences. Industrial design closes the gap between what exists and what is possible. It is a transdisciplinary profession that leverages creativity to solve problems and co-create solutions with the intention of making a better product, system, service, experience or business. In essence, it provides a more optimistic way of looking to the future by reformulating problems as opportunities. It links innovation, technology, research, companies and customers to provide new value and a competitive advantage across the economic, social and environmental spheres (ICSID, 2013). International Council of Societies of Industrial Design.

In the previous institutional definitions, designers are seen as having strategic, technical and creative capabilities that generate solutions to practical problems, that is, innovators. Among their actions, we have the generation of ideas, the preparation of sketches, the selection of methods, the preparation and conclusion of the project, the monitoring of the production and post-production processes (industrial or not), following the modes of use and consumption, leading and taking care of the disposal and recycling of the product. In addition, these actions are crossed by: the dedication to the creation of strategic solutions for cultural, economic

1 The Oslo Manual provides guidelines for collecting and interpreting data on innovation. It seeks to facilitate international comparability, and provides a platform for research and experimentation on innovation measurement. Its guidelines are principally intended to support national statistical offices and other producers of innovation data in designing, collecting, and publishing measures of innovation to meet a range of research and policy needs. In addition, the guidelines are also designed to be of direct value to users of information on innovation (OCDE / Eurostat, 2018, p. 19).

exchange and the offer of products with vast aesthetic and sustainable potential.

These definitions serve to return to design education and training and to talk about the requirements of those who study it, in order to obtain professionals capable of creating new solutions to old social problems, which is a responsibility of design courses. Taking into account that it is a requirement to understand the conditions of possibility of the intentional training of an innovative professional and, ethically, to know how much innovation is committed to the improvement of human life. All this based on the understanding that innovation is something with which one enters into a relationship (Boanova, 2019) and not something that can be trained to acquire (OECD / Eurostat, 2018). This is why it is significant to critically look at the concept of innovation.

To question the potential of design to escape from rigid structures and its ability to offer some form of innovation that resists social problems, a study was conducted through a case that highlights the client's performance in the social sphere and shows a product that resists and goes beyond competitive and capitalist advantages. The case *The Shoe That Grows* is presented as a plan of possibilities for what it means to innovate in the perspective of what we want to defend in this article, in which the client seeks a new form of expression in the contact with the reality of children in vulnerable conditions, summarized here by the expression, "sick feet of children". The scene is described in the next section to better present the case.

1.2. SCENE– THE SHOE THAT GROWS

During his stay in Nairobi, the capital of Kenya in Africa, Kenton Lee had an inspiring idea while watching children run and play barefoot or wearing broken shoes.

> One day, I was with the children and I saw a girl with shoes that were too small. She had made an opening in the tip of the shoes to leave room for the fingers [see Figure 1]. [...] I saw that her fingers were out, full of pus, dirt and infected wounds [see Figure 2]. Later we discovered that 300 million children in the country did not have adequate shoes or walked barefoot through the streets. Her feet directly touch the floor, with debris, bacteria, trash and broken glass, which leads to a high percentage of injuries and infections. [...] It was then that I had an idea: What would happen if we could create a shoe that would increase in size according to the child's growth? (BBC Brasil, 2015; CBN, 2016).

Lee felt he needed to do something about it. His unexpected and involuntary encounter would lead him to design a sustainable shoe that would satisfy the constant growth of children and somehow accompany them. The rapid growth of children leads their parents, guardians or responsible to constantly invest in the purchase of larger shoes, which is sometimes difficult even for families with good financial conditions. Imagine, then, the difficulties of low-income families in keeping the feet of babies and children warm and protected, both on the African continent and throughout the world. *The Shoe That Grows* product has a lifespan of up to five years, the sandals are equipped with a rubber sole similar to that of tires and the reinforced straps are made of leather. What led the American from the state of Idaho to create shoes that 'grow with children' was the realization that their growth is constant and that the shoes purchased one day, barely fit the feet the following year, making them obsolete. Therefore, Lee met a team of designers who develop sandals that can reach up to five sizes, equipped with adjustable buckles and super-resistant soles. "The creation process was interesting because I am not a designer" Lee told the BBC website. “And I didn't know anything about shoes. I'm just a common guy who had a good idea” (BBC Brazil, 2015). For the implementation of this design, he had the help of a company from the state of Oregon, which allowed him to technically materialize his idea. According to him, the entire design was created for the functionality of the footwear. Although he liked the look of the sandal, Lee says it was never a concern (see Figures 3, 4, 5 and 6). "Our goal was to develop a shoe that would last a long time" (BBC Brazil, 2015). The most interesting thing is that Lee's invention has been sent in an amount of more than 50,000 pairs to more than 70 countries such as South Africa, Kenya, Ghana, Nicaragua and Guatemala (VOA News, 2016). An incalculable reward for its creator.

Images of the creation of Kenton Lee: *The Shoe That Grows as a Child Grows* (BBC Brasil, 2015; CBN, 2016; VOA News, 2016).

Figure 1. Small shoes clipped to fit fingers, which caught Kenton Lee's attention in Nairobi.

Figure 2. Photograph of injured feet of children in Nairobi.

Figure 3. First prototype of the shoe.

Figure 4. Final result with Velcro.

Figure 5. Final result with Velcro and press stud buttons.

Figure 6. Photographs of shoes in use.

What draws attention to Lee's innovation is that he sought the solution to his need in the design field. His perception centered on the human being took him beyond the protection of the feet, raised the question of time and what can change, what can be adjusted and grow in the product. Protecting the feet is a basic necessity, *The Shoe that Grows* resulted in the implementation of a new product based on a redesign.

This innovation does not mainly meet consumption patterns, economic growth, product repositioning, business plans or competitiveness. The new product satisfies a basic human need that until that moment had not been addressed. Such innovation is close to the way one thinks that can be innovative, within the perspective of creating problems. Through the writings of Deleuze (2006), the creation of thought is the only true creation and is linked to the creation of problems and to thought without base on a previous image, without similarity. Lee reinvents the problem, his encounter with sick feet led him to a solution that did not exist until then. The result of his thinking, which at first had no image, led him to invent a shoe without similarity. What we want to explore is the repeated act as common sense of thinking about solutions and problems as something already known. Lee not only created a product or recreated the shoe, with the expression of the new footwear he showed this dimension inherent in the growing body. Until then, growing up was non-existent or only remembered when buying a new shoe with a larger number. Lee acted as creator when he raised an unexplored problem by the footwear industry, his product fills a gap and talks about growing. Lee's task was that of an artist, he created a *noema* - state that does not exist outside the proposition that expresses it, a new node of meaning and turned it into an artifact (Deleuze, 2015).

2. CONCEPT OF INNOVATION AND CRITICISM TO UNIVERSITIES

Innovation can be seen as a typical business strategy. Companies seek to innovate to generate and capture value. Through operational excellence, they seek to innovate in: process, organization, logistics, product and business model (FAPESP, 2010; Rodríguez *et al*., 2008; Salerno, 2012).

Salerno (2015) defines the differences between discovery, invention and innovation. The discovery is presented as a fact of the physical or scientific world and must be socially validated by their peers. On the other hand, the invention is a construct, a mentally created model that establishes a parallel between an idealized observation and a theory, idea or concept that results from the synthesis of simpler ideas. As an example of the invention, the author cites the 14 bis construct by Santos Dumond. Innovation is something that is linked to the market, it is an economic concept and cites as examples: frozen cheese bread, the clay filter that purifies the water and the container that revolutionized the protection in cargo transport. He adds that innovation is more than high tech, it is not the result of chance, but of systematic work organized and managed with the potential to introduce a new habit.

The concept of innovation that prevails in today's world moves away from Lee's achievement. The concept is specifically dedicated to a business and execution plan, to the client, to the consumer, to the target audience (appropriate name in the sense of who is impacted by something). Melo and Abelheira (2015) said, "We need to put people first. The customer experience is a strategic property of great importance for today's businesses" (p. 177). Let us keep in mind that the act of putting people first is immediately followed by the experience of those who are customers and consumers. If we think of the barefoot children of Kenya, they are not customers or potential consumers worthy of strategic planning of importance to current business models. Perhaps, in this market approach is the fragility of what it means to innovate, which seeks to find the answers to new problems in the midst of what is known.

It is not unusual reports and criticisms arguing that universities, schools and education must adapt to new times of innovation and updated business models. The fact that education is always one step behind the reality of the market is not uncommon. Designers are seen as not so capable compared to professionals trained by business and administration schools, who present themselves as excellent in the execution, in the enterprise and in the administration of what it is to innovate (Melo and Abelheira, 2015).

The criticism to education field, which for some reason mistrusts the market and avoids quick approvals, is based on the understanding that serving the market means reducing production for consumers. This reduction renounces the potential of the creations that will come in the mold, for example, of *The Shoe That Grows*. It finds no echo in the organized systematizations proposed by business schools that do not look at these cases when they seek profitability, competitiveness and growth. The education machine does not easily combine with the market machine when it moves away from the main concern of defending life.

Other fronts subject to criticism are the notes and discussions on the few Brazilian patents, the economic percentage spent on research and development and the goals compared to other countries regarding the innovation rate. They are indicators of little value but widely used and list the percentage of companies that claimed to have carried out some innovation, even if such innovation already existed in the market (Salerno, 2012). Thus, innovation has become a place of theoretical convergence in the economy in which educational actions also become commodities. The realization of economic growth makes it imperative to adopt new technologies and apply more efficient management methods. Faced with this new reality, there is a need to expand human capital, in which work is adjusted through education and training in relation to a set of elements identified as the "true engine of economies" (Rodríguez *et al*., 2008, p. 65).

According to Erber (2012) in his text Innovation as a consensus, the last quarter of the 20th century was a period of technological changes, manifested by the electronic paradigm that became ubiquitous and covered all sectors of the economy: from agriculture to creative industries. The term information and communication technologies (ICT) consolidated the paradigm of biotechnology and the emergence of nanotechnology. "Technologies have inserted the theme of 'technological innovation' in the positive agenda of public and private decision makers, making it a symbol of 'modernity' endowed with prestige and a strong capacity for legitimacy" (p.23). This prestige also creates demands in educational institutions that are seen as cooperative partners in this process. However, we wonder how to build the agenda regarding the care of human life.

Returning to the concept, what can be presented as innovation? Innovation[2] can quickly be seen as the creation of something new, but today the word is directed to the context of ideas and inventions related to economic exploitation and the inventions that reach the market. According to the Organisation for Economic Co-operation and Development (OECD, 2015), innovation is the process that includes technical, design, development and management activities that result in the commercialization of new (or improved) products and processes.

3. APPROACHES ABOUT THE CONCEPT OF INNOVATION IN THE OSLO MANUAL

The first edition of the Oslo Manual (1991), *Guidelines for Collecting, Reporting and Using Data on Innovation*, was edited by the Organisation for Economic Co-operation and Development (OECD) with the objective of guiding and standardizing concepts, methodologies and the construction of statistics and indicators for the development research of industrialized countries. In 2018, the manual reached its fourth version, adding comprehensive updates and more compatible with the implementation challenges in a context of digital transformation facing the economy and society.

The concept of innovation presented in the Oslo Manual (OECD / Eurostat, 2018), establishes that there are uncertainties about the results of innovative activities, about how much time and resources are needed to implement a new production, marketing or production method, or how successful these activities are. It reiterates that innovation implies investment. For Breschi *et al*. (2000), innovation is the substrate for overflows. The benefits of creative innovation are rarely entirely appropriate by the inventor. Companies that innovate can benefit from access to new knowledge or the use of original innovation. For some innovation activities, imitation costs are substantially lower than development costs, so an effective ownership mechanism that offers an incentive to innovate is required. Another noteworthy aspect of the Oslo Manual says that innovation requires the use of new knowledge, a new use or a combination of existing knowledge that is not standard routines.

The commitment to education proposed by the manual is placed as a form of employee training, where design is mentioned. Examples of training as an innovation activity include: a) training staff to use innovations, such as new software logistics systems or new equipment; b) relevant training for the implementation of an innovation, such as instructing employees or customers about the innovation capabilities of a product; c) the training necessary to develop an innovation, such as training in research and development or design.

In Chapter 5 of the Manual, *Measuring Business Capabilities for Innovation*, design is cited as one of the necessary elements to train employees and to develop an innovation. Design skills are listed, divided into three categories defined by their skill sets and purposes: a) Engineering design, including technical specifications, tools and prototype construction; b) Product design that determines the shape, color or pattern of objects, the interface between the software and users or the user experience in the servi-

2 Word derived from the Latin term *innovatio*, which refers to an idea, method or object that is created by breaking with previously known patterns or styles.

ces and c) Design Thinking[3] , which is a systematic methodology to address the design of a good, service or system.

The two studied versions of the OSLO Manual (OECD / Eurostat, 2005, 2018) do not attribute the diversity of meaning to innovation with respect to the scope of its application as a vector of human development and improvement of the quality of life. The nine appearances of the word "life" contained in the 2005 Manual and the five appearances in the 2018 version refer to the product life cycle. Only in Chapter 8, the manual presents a table (8.1 Innovation objectives and outcomes for measurement, by area of influence) in which it exposes an important element: Improving the quality of life or well-being but does not explore how to achieve such improvement. How is that negligence possible? It is not surprising that universities and design courses find difficulties in developing what it means to innovate according to the perspective proposed and dictated academically by the manual. The manual is designed to analyze emerging problems in economic, social and environmental terms, but makes use of a language that serves the market, products and services without focusing on the human aspect.

Will it be possible to distort the meanings according to new agendas and towards different forms of production of the innovation concept?

3 Design Thinking is a systematic methodology for the design process that uses design methods to identify needs, define problems, generate ideas, develop prototypes and test solutions. It can be used for the design of systems, goods and services (Brown, 2008).

4. INNOVATION CONCEIVED AS RESISTANCE: A TWIST IN THE CONCEPT

Let's go back to Lee's wish: he wanted to protect children's feet. Deleuze and Guattari (2011) do not disassociate the desire and the process of a creative escape line, drawn by the mechanisms of desire itself. Due to the demands of the capitalist market, desire separates itself from this process, subordinated to a system of repression-stress that detracts from the desire. Therefore, the clinical and political problem of the Deleuze and Guattari theory is to return to the process what intensifies the desire, allowing the creation of new ways of being in the world.

In this way, desire seeks other forms of expression and production of meanings along with the concept of innovation. It is remarkable that any mechanism of desire is combined with social mechanisms. However, it makes something escape, drain and create a time of fidelity and attention towards desire. These mechanisms respond to the will to deviate and recognize the losses that capital leads us to assume as true about what it is to innovate.

This article seeks to alert the almost exclusive place of theoretical convergence in the economy in which the guidelines for innovation are focused and strictly concerned with the search for economic growth and dedicated only to the application of more efficient management methods. What we want to question is the direction that innovation has taken, especially with respect to the work of universities. In Lee's case, we can see the concern with human development and the improvement of the quality of life, this is the vector that is asleep and forgotten by academic guidelines. Lee's case serves to illustrate another possible and invented path that is transformed but also is political, ethical and aesthetic. This 'asleep' side names what he imagines, contains clues about an innovative way of doing things that could interest university work and was thought of in this article as a space of creation and resistance.

It is important to highlight that this text is not against making management methods more efficient but clarifies that management is the only key to actions that involve innovation, especially those that arise from experimentation in educational environments. The Oslo Manual theory of innovation has taken a straight and unique line with a focus on the consumer, its training, maintenance and management.

Although Salerno (2015) expresses that innovation is not the result of chance, what is pointed out here is that it is the result of an unexpected and involuntary encounter, which does not mean that there is no work. However, only organized and systematic work does not guarantee the success of innovation. The twist also serves to point to clues in the reports and reviews that express that universities, schools and education are always one step behind market agendas.

The approach to the Manual for education raises concern, as it is proposed as a tool with a focus on training human capital to achieve innovation. In this context, the Manual talks about identifying possible forms of experimentation where design is mentioned but does not indicate the paths of creation that promote the quality of life.

Creating something with the sole purpose of consumption, even if it is distant and without considering people's lives, makes the innovative potential extremely reduced. The twist, in this article, values the care of life. This is the key to what we stand for. Lee's excellence in innovation is undeniable, which ended up generating an expanding business plan in a segment that meets the first needs of human life. If we are still not able to take care of the feet of thousands of babies around the world, let's think about the following questions: Are we really innovating? How powerful will the business model be if it does not protect and care for life?

5. FINAL CONSIDERATIONS

Thinking about the concept of innovation without turning it into the universal concept is a political form of resistance. In the expression of innovating, there are other meanings such as: change for the better, give a new look, fix, correct, adapt to new conditions something that has been overcome, inappropriate or obsolete. To twist the concept of innovation is to think about its dimension and focus on the care and conservation of human life, without neglecting ethical, aesthetic and political issues. Therefore, turning or twisting the concept of innovation implies a gesture of constructing another aesthetic of existence that wishes to drive active and creative forces that place subjects in the face of other problems, as in Lee's case.

The case of *The Shoe That Grows* begins with human need and uses design and business strategies to democratize access to footwear, which in this case is an essential element. Financial capital comes as a support for this and not as a priority in an innovation project that seeks to reach a niche not yet served. Innovation comes first through the creation of thought, which in Lee's case, arises from the contact with injured feet.

Returning to Deleuze's writings, the creation of thought is the only true creation and is linked to the reinvention of problems. Lee has an encounter with injured feet, this encounter makes him think while reinventing the problem to be solved with an economically viable and more durable shoe for a particular community. The way to innovate of the Oslo Manual ignores the creation of thought and is based on the anticipation of problems. In addition, innovation agents have the power and responsibility to provoke innovation by training human capital while dealing with content, organizing, preparing, translating and waiting for an immediate exercise of mental faculties. The concept of innovation presented in the manual ignores what is the creation of thought caused by unexpected or spontaneous encounters.

BIBLIOGRAPHY

BBC Brasil. (2015). Americano cria sapato que “cresce” com pé da criança. *BBC News Brasil.* Retrieved from: https://www.bbc.com/portuguese/noticias/2015/04/150427_sapato_que_cresce_mv

Boanova, C. O. (2019). *Invenção e criação: o que pode o Design e seu ensino?* Universidade Federal de Pelotas.

Breschi, S., Lissoni, F., and Breschi, S. (2000). 40 th European Regional Science Association Conference Barcelona. Retrieved from: www.econstor.eu

Brown, T. (2008). Design Thinking. *Harvard Business Review,* 84–92. Retrieved from: https://hbr.org/2008/06/design-thinking

CBN. (2016). *Regent Grad Changing Lives With a Shoe That Grows - YouTube.* Youtube. Retrieved from: https://www.youtube.com/watch?v=DAWB7L-Hw_0o

Deleuze, G. (2006). *Diferença e repetição*. Graal.

Deleuze, G. (2015). *Lógica do sentido* (5th ed.). Perspectiva.

Deleuze, G. and Guattari, F. (2011). *O anti-Édipo.* Imago.

Erber, F. S. (2012). Inovação Como Consenso. *Revista USP,* 93(mar./maio.), 21–32.

FAPESP. (2010). *FAPESP: Indicadores de Ciência, Tecnologia e Inovação em São Paulo 2010.* Retrieved from: http://www.fapesp.br/6479

ico-D. (2015). *Defining the profession* | ico-D. Retrieved from: https://www.ico-d.org/about/index#defining-the-profession

ICSID. (2013). *The International Council of Societies of Industrial design. Definition of design.* Retrieved from: http://www.icsid.org/about/about/articles31

Melo, A. e Abelheira, R. (2015). *Design Thinking & Thinking Design: Metodologia, ferramentas e uma reflexão sobre o tema* (Rubens Prates (ed.)). Retrieved from: https://www.amazon.com.br/Design-Thinking-Metodologia-ferramentas-reflexão-ebook/dp/B0731NNDV7

OECD/Eurostat. (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition, *The Measurement of Scientific and Technological Activities.* OECD. doi:10.1787/9789264013100-en

OECD/Eurostat. (2018). Oslo Manual 2018: Guidelines for Collecting, *Reporting and Using Data on Innovation* (4th ed.). OECD. doi:10.1787/9789264304604-en

OECD. (2015). Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, *The Measurement of Scientific, Technological and Innovation Activities.* OECD. doi:10.1787/9789264239012-en

Rodriguez, A., Dahlman, C., and Salmi, J. (2008). *Conhecimento e Inovação para a Competitividade*. Brasília, Banco Mundial; Confederação Nacional da Indústria (CNI). Retrieved from: file:///Users/raquel/Downloads/Conhecimento_e_inovacao_para_a_competiti.pdf

Salerno, M. S. (2012). Inovação tecnológica e trajetória recente da política industrial. *Revista USP*, 93(Março-Abril), 46–58.

Salerno, M. S. (2015). *O que é inovação: conceitos básicos*. YouTube. Retrieved from: https://www.youtube.com/watch?v=IV8l8ejEfx8

VOA News. (2016). *A Shoe That Grows as a Child Grows - YouTube*. Youtube. Retrieved from: https://www.youtube.com/watch?v=X2uH0VCQxjA&list=PL4cuYpme8PIvPbigLFBwqGo-2rkXLmKF2&index=2&t=0s

OBRA
revista de comunicación
DIGITAL

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

STUDIES AND RESEARCH

How to verify without experts and reach the big leagues: University fact checking of the presidential debate of Chile in 2017

Cómo verificar sin expertos y llegar a las grandes ligas: Fact checking universitario del debate presidencial de Chile en 2017

Verificar sem especialistas e alcançar as grandes ligas: fact checking universitário do debate presidencial do Chile 2017

7

ARTICLE

Enrique Núñez-Mussa

Department of Journalism
Pontifical Catholic University of Chile

Professor of the School of Communications of the Pontifical Catholic University of Chile (PUC). Master in Journalism, Media and Globalization with a specialization in Journalism and Media Across Cultures in a joint degree from the Universities of Aarhus, Denmark; Hamburg, Germany and The Danish School of Media and Journalism. SUSI Scholar in Media and Journalism from the University of Ohio. Degree in Social Communication with the title of Journalist and Minor in Literature from the PUC. Editor in chief of www.factchecking.cl

esnunez@uc.cl
orcid.org/0000-0001-6590-819X

RECEIVED: May 1, 2019 / ACCEPTED: November 06, 2019

Abstract

This article presents the teaching methodology applied in a fact-checking project to verify the presidential campaign and the televised debate of the 2017 elections of Chile in a journalism undergraduate course. The design and development of that project is explained. Their journalistic and learning results are analyzed, among these is to have been shortlisted in a Journalism award of professional excellence. The assessment made by students of their learning when verifying the public discourse of the authorities and their contribution to democracy in a watchdog role are exposed.

KEYWORDS:

Presidential debates, Fact checking, Journalism, Teaching, Verification, Data checking.

Resumen:

El artículo presenta la metodología docente aplicada en un proyecto de fact checking para verificar la campaña presidencial y el debate televisado de las elecciones de 2017 en Chile, en un curso de estudiantes de pregrado de Periodismo. Se explica el diseño y desarrollo de ese proyecto. Se analizan sus resultados periodísticos y de aprendizaje, entre los que está haber sido preseleccionado en un premio de Periodismo de excelencia profesional. Se *expone la valoración que hicieron los estudiantes de su aprendizaje al verificar el discurso público de las autoridades, y de su aporte a la democracia en un rol de perro guardián o watchdog.*

PALABRAS CLAVE:

Debates presidenciales, Fact checking, Periodismo, Docencia, Verificación, Chequeo de datos.

Resumo:
O artigo apresenta a metodologia de ensino aplicada em um projeto de verificação de dados para verificar a campanha presidencial e o debate televisionado das eleições de 2017 no Chile, em um curso de graduação em jornalismo. Se explica o plano e o desenvolvimento deste projeto. Se analisa seus resultados jornalísticos e acadêmicos, dentre os quais ele foi selecionado em um prêmio de Jornalismo por excelência profissional. Se apresenta a avaliação feita pelos estudantes de sua aprendizagem ao verificar o discurso público das autoridades e sua contribuição para a democracia em um papel de cão de guarda ou watchdog.

PALAVRAS-CHAVE:

Debates presidenciais, Fact Checking, Jornalismo, Ensino, Verificação, Verificação de dados

1. INTRODUCTION

During a semester, 26 Journalism students of the School of Communications of the Pontifical Catholic University of Chile, carried out an exercise of fact checking or data verification to the statements issued by the candidates for the presidency of Chile during the election campaign of 2017 in the debate transmitted simultaneously by all the television stations.

It was carried out under the premise of learning by doing, in a constructivist pedagogical approach whose method is that the student assimilates knowledge in the implementation of an activity, in a situation propitiated by the teacher with a social cognitive approach in which learning occurs in the exchange and cooperation with fellows, peer tutors and teachers (Schunk, 2012). It is a method that has been proven effective for the acquisition of journalistic skills (Pain, Masullo Chen, and Campbell, 2016).

2. OBJECTIVES

Objectives were raised in two lines. The first regarding learning, was measured from the reflection that students made of their process and the ability to achieve goals. Journalistic objectives were also raised: having two publications of professional and competitive standards regarding the other fact-checking initiatives that were active in Chile during the election.

3. LITERATURE REVIEW [1]

Fact checking was defined by Lucas Graves (2016, p.25) as: "Any analysis that publicly challenges a rendered account that is in competition." The author raises this definition to defend the thesis that it is a journalistic genre itself, with its own codes.

1. The theoretical framework of this work is part of a project funded by the *Fondo Nacional de Desarrollo Científico y Tecnológico de Chile*, Fondecyt, project N°1170843.

By breaking down the definition to operationalize it in a teaching process, the word analysis represents a reflective work around the data as evidence. The contrast of the information collected by the checker with other data allows to draw a conclusion that confirms or denies the information of the person who delivers an accountability. This analysis is a challenge and competes with the original statement, giving the reader the opportunity to discern his position on the subject.

Bae Brandtzaeg and Følstad (2017) cataloged the different fact checking projects in areas of concern, which resulted in three categories: online rumors and jokes (e.g. Snopes.com, TruthorFiction.com), specific issues or controversy (e.g. StopFake, TruthbeTold) and politics and public affirmations (e.g. Politifact, FactCheck.org).

The latter gained notoriety especially after the 2016 presidential election in the United States (Singal, 2016; Kurtzleben, 2016), with initiatives that have massified verification techniques with an open public methodology such as *Factcheck.org* of the University of Annenberg, the *Politifact* site of the *Tampa Bay* newspaper and The *Washington Post Factchecker*. These three pioneering political projects in the United States have led other media such as the *National Public Radio* and *The New York Times* to join.

The objective of the political *fact checking* is to emphasize the *watchdog* role of Journalism, that oversees the authorities and prevents abuses (Dumitru *et. al*., 2011; Iyengar, 2011; Jamieson and Waldman, 2003) by checking the information issued by people in a situation of power with primary and open sources. The aim of demanding accountability (Jamieson, 1992), is to check if the subject fulfilled promises he proclaimed publicly, the contradictions in his speech and the quality of his sources of information.

The project presented in this article is of political *fact checking*, therefore, the activity of the students was focused on having a coherence between the conceptualization of the role of *watchdog* and its effective performance. In the teaching field, the challenge is to determine if this concept can be transferred pedagogically. That is, if you can teach to exercise a journalistic role through the verification of public discourse.

In the journalistic industry, the role of a *watchdog* is in permanent tension due to two pressures analyzed by Casero-Ripolles, Izquierdo-Castillo and Doménech-Fabregat (2014), the first has to do with the professionalization of political communication and the second is related to the commercial and political pressures of the media.

These two issues are especially sensitive when verification is understood as a journalistic genre, since the methodology involves contacting the original source that issued a statement to verify the data provided, giving room for clarification. This process causes the verifier to deal with the politician's communication advisors, which complicates the process as they are people who seek and have the tools to influence the public agenda of the media.

The second aspect is in tension with the code of international principles established by the Poynter Institute, through its International Fact Checking Network, which includes political balance without expressing partisanship and ensuring transparency in their working methods as well as in their financing (Poynter Institute, 2016). This makes it difficult for media that share a commercial vocation or whose owners are known to have a political agenda, but it represents an opportunity for university and independent projects.

4. THE PRESIDENTIAL CAMPAIGN AND THE 2017 DEBATE

Eight candidates participated in the 2017 presidential election in Chile. Two representatives of the main left and right coalitions, Alejandro Guillier and Sebastián Piñera respectively, a third candidate represented an emerging coalition of the left and five others from independent parties or movements.

The televised presidential debates in Chile became a tradition within the country after the return to democracy in 1989, after 17 years of dictatorship under Augusto Pinochet's regime. By being organized by television stations independently or by the National Television Association (Anatel), journalists have played a key role in being responsible for interviewing candidates (Núñez-Mussa, 2018).

The televised debate is one of the last instances of the campaign and one of the few in which candidates are in a shared space with their contenders, so that the voter can compare (Jamieson and Adasiewicz, 2000). The debate is not only a media event but also a civic event that is part of the democratic process in the development of the election (Schroeder, 2000).

The eight candidates participated in the Anatel 2017 first-round debate that was broadcast simultaneously by all the national free television stations, which are those that belong to the association. The candidates were interviewed by four journalists who represented their television stations. Therefore, they are the ones who have greater control over the triangle of disputed agendas that collide in this instance: the audience, the candidates and the interviewers (Jackson-Beeck and Meadow, 1979).

For the development of this exercise, verifying a debate offers a challenge since these are characterized by having a spontaneity component (Minow and Lamay, 2008) when facing candidates on topics that are not within their usual agenda. Therefore, it requires a strategy to predict some of the themes and statements.

Turcotte (2015) concluded that the debates whose format was guided by journalists, compared to those who had questions asked by citizens, had a more limited thematic range due to a proper conditioning of the commercial logic of the media. Therefore, the preeminence in the participation of journalists, offers a strategic opportunity to approach a prediction of the issues that will appear to be verified, carrying out periodic press reviews before the debate, that show what are the issues to which the Chilean media have given more coverage and have associated more with each candidate; considering the high concentration of media in Chile (Monckeberg, 2009) and the homogeneity of editorial lines as a consequence (Gronemeyer and Porath, 2015).

This led to the decision to follow up the candidates during the campaign and also verify the claims of that period. This would allow students to establish contact with the campaign teams and determine the most relevant sources to verify information in addition to learning the research techniques and the way in which the candidates articulate their discourse. This would give them the tools to address the verification of the claims of the debate, the day after they were issued.

5. METHODOLOGY

26 undergraduate students of Journalism between the third and final year of study worked in the exercise within a minimum course.

The work was guided by a teacher who acted as editor in chief, supported by a team of five teaching assistants who worked as editors, the most experienced assistant was also the team coordinator.

For the US presidential debates between Hillary Clinton and Donald Trump in the 2016 election, media that were not specialized in verification such as the *National Public Radio* (NPR, 2016) and *The New York Times* (Ryan, 2016) performed online checks trough their journalists specialized in the coverage of specific areas, for example, health or education.

Projects specialized in fact checking used verifiers who had been checking the candidates during the year. For example, *Politifact* (Qiu, 2016) had 10 verifiers in the first debate and *Factcheck.org* (Farley *et al*., 2016) had nine for the last one. Working with university students implies a greater challenge since they are not experts in journalistic coverage or in the campaign and must learn the verification techniques.

To achieve depth and expertise, the 26 students were separated into groups from two to six members per candidate. Each group was in charge of a teaching assistant.

Individually, the students had to fill three forms of 10 verifiable statements, that is, with hard verifiable data that the candidates would have issued in the media. In class, students learned what made a statement verifiable, saw examples and how to check them.

Having no ability to predict which issues would appear in the televised presidential debate, a frequency-based probability strategy was established. If a statement appeared repeated in more than one communication outlet, there was a possibility that the issue would arise in the debate as it was already inserted in the journalistic agenda.

Secondly, its relevance was considered as a topic or statement that could have a direct effect on citizens. This last parameter is the dividing line between a journalistic work that uses tools of the social sciences and a research work of that discipline. As proposed by the creator of *Politifact*, Bill Adair: "We are journalists, not social scientists. We choose statements to check based on our judgment" (Adair, 2013).

The above is related to the discussion that Uscinski and Butler (2013) began regarding the validity of the epistemology of *fact checking*, where they argue that reaching a verdict is arbitrary, because it does not have enough support in the social sciences and criticize the methodology to select sentences from journalists. This essay was refuted by Amazeen (2015) using empirical data that showed the coincidences in the selection of statements and criteria of different verification projects in the United States, which was again questioned by Uscinski (2015), who continued to demand greater methodological transparency.

Even so, the work of Amazeen (2015) coincides with that of Mena (2019), which demonstrates through data that journalists who practice the verification of public discourse coincide in their mission of demanding fair accountability and oppose an activist or biased role. Therefore, we consider it essential to have two explicit criteria shared throughout the newsroom that would guide the selection of sentences.

In order to help the students to make a sweep as complete as possible, different types of media were distributed among them and were rotated for each submission. This way, each student did a press review on three different platforms, among:

- Printed.
- Digital.
- Radio.
- TV.
- Official social networks, programs and websites of the candidate.
- Spaces of alternative content such as videos on YouTube.

The statements were uploaded to one form per candidate that served to transfer the responses to a common form that constituted a database with what was said by the contestants. In addition to writing the statement, the students had to explain the date it was published, the media, mark the segments of the sentence that were verifiable, justify the criteria for that decision and suggest a research strategy to carry out the check. This last aspect should be specific, because it first fulfilled the function of the student repeatedly practicing the intellectual exercise of planning an investigation and serving at a practical level to advance in the subsequent verification stage.

After each delivery of statements, students received feedback from the teaching assistants and the teacher to improve the next submission. Once all three were completed, each editor made a selection based on the frequency and relevance criteria explained. These were discussed in a meeting with the complete team of editors and guided by the teacher. From that selection, the affirmations to be verified were chosen and distributed among the students in the same teams in which they looked for them.

All student investigations should be replicable to consider the check accomplished. That is, any reader can follow the steps that the journalist executed to reach the same verdict. This entails a commitment to transparency in the process of gathering information and in the presentation of it. Therefore, resources such as the off the record or any other method to obtain data that was not through an open source and accessible by every citizen were not allowed.

The second criterion that was used was validity, understood for this exercise as the quality of the chosen source. For that, the strategies of portals such as *Politifact* (Drobnic, 2018) and *Chequeado* (Chequeado, 2018) were used, which first urges in consulting the original source that issued the statement. This contains the ethical component of allowing the issuer to clarify the origin of their data and if there was any error in the phrase. Then, the official source or the entity from which the data emerged or the highest authority in the matter regarding the subject being verified is sought. Once these steps were completed, the students contacted alternative sources, such as NGOs, foundations and experts.

The work with alternative sources was especially supervised for each statement, since these foundations or entities had to be independent, not linked to the candidates or the communities that support them, but with a technical profile.

Regarding the experts, it was a requirement that they have academic publications, teach or be linked to the subject in analysis. The specialists provided the journalist with an understanding of the subject and context, as well as analysis. However, it should always be a technical analysis and not based on opinion.

Before beginning the research process, students had a resource and technical workshop to track public information through websites. Since the Transparency Law came into effect in 2008 in Chile (Law No. 20,285, 2008), public bodies have made databases and documents available to all citizens, whose access requires knowing a series of steps. The students made two submissions of their work, the first only to measure progress in the research process and the second with a written chronicle. In addition to the text to be published, they should detail how they got the information in parallel to each paragraph for each submission.

Prior to the delivery of the second chronicle, the students worked in their articles in classes as if it were a newsroom, so they could clarify doubts, unify the style and establish a collaborative dynamic of teamwork.

A characteristic element of the fact checking portals is the verdict on the affirmation, being also a striking component to attract the attention of the reader. The pioneer is the *Truth-o-meter* of *Politifact*, which assesses the truthfulness of a statement on a six-level scale (Graves, 2016). That example and the Mexican project *El Sabueso* of *Animal Político* (El Sabueso, 2015), which brings the verdicts to the audience through the caricature of a dog, were used as a reference for the creation of our own instrument.

For the above, a six-level scale was generated with an even number to avoid tending to the middle and clearly defined, so that the student knew what verdict to apply with the teacher's final approval. We worked with an illustrator to develop a character that could have continuity for future initiatives of *fact checking* (Figure 1).

By presenting a scale, the verdict shows that the objective is not to harm politicians, but to establish a standard of accountability within the democratic system.

The writing style was defined based on different examples, looking for precision and that the texts were as concise as possible. The premise raised to the students was that each line should be supported by evidence that verifies a fact within the statement.

During the transmission of the debate, the team of editors participated in a joint viewing with a subsequent meeting to discuss the verifiable statements that arose in that instance. In parallel, the students subsequently filled out a document with the identified phrases of the candidates they were following.

The next day, the students worked from 8.30 am to 8 pm. in the verification of their affirmations in the university, as if it were a professional newsroom. The day began with a meeting with its editors to define the final statements to be checked and then carry out the verification. At closing time, everyone submitted their finished articles.

6. RESULTS

6.1. JOURNALISTIC RESULTS

The project had two publications in the politics section of the mainstream portal *T13.cl*, which only acted as a distributor. Both explained the work methodology. The first, as a result of the exercise carried out during the semester, contained the verification of the claims that the candidates made in the campaign and was entitled: *Credible, not credible or creative? We verify the statements of the presidential candidates* (Fact Checking UC, 2017a). This work was among the four most viewed content in the politics section of the portal.

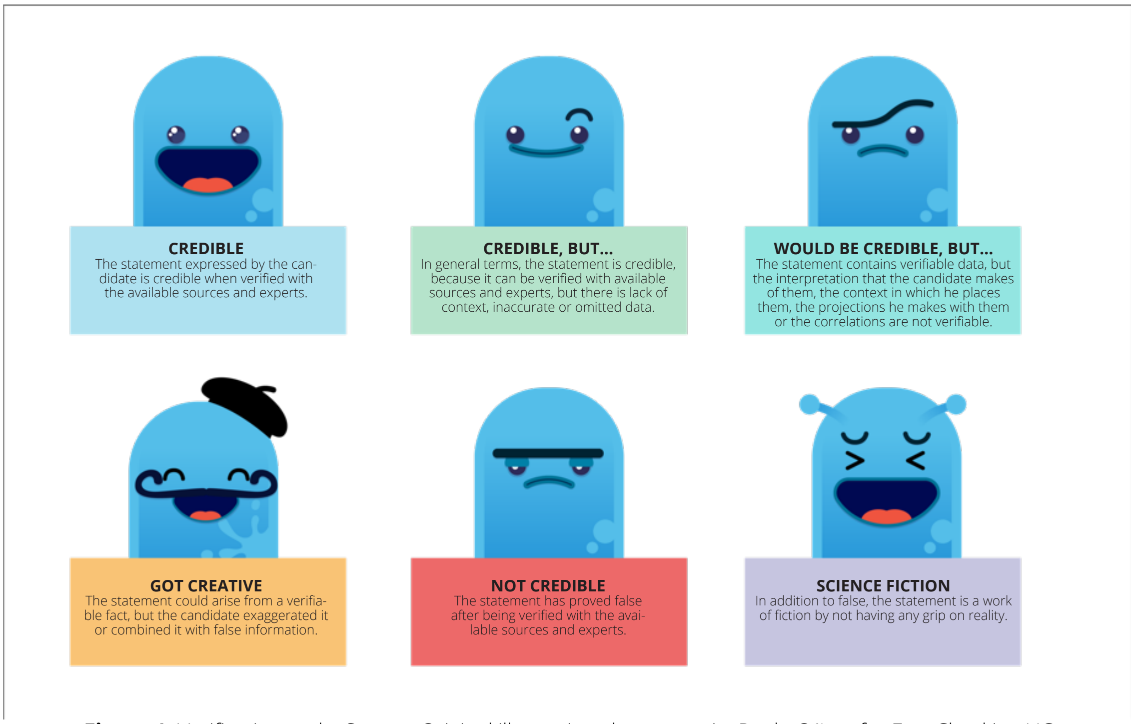

Figure 1. Verification scale. Source: Original illustrations by cartoonist Paulo Oñate for Fact Checking UC.

The second publication consisted of the verification of the candidates' statements in the televised presidential debate and was published the day after the broadcast under the title: *Credible, not credible or creative? Verification of the statements in the Anatel debate* (Fact Checking UC, 2017b).

To confirm that a professional standard was achieved within the framework of an academic exercise, examples are presented in comparison with the two professional journalistic fact checking projects that also addressed the debate, *Chilecheck* (Chilecheck, 2017a) of *CNN Chile* and *El Polígrafo* (El Polígrafo, 2017) of the newspaper *El Mercurio*.

The possibility of having a team of 26 verifiers trained during a semester and a team of six editors, facilitated publishing before the other two media.

While *Chilecheck* focused on the two candidates with the highest percentage in the polls, the university project verified all eight. *El Polígrafo* also included all, but only one statement per candidate, compared to the project checked by students that had an average of three statements per candidate.

Of the three statements of the candidate Sebastián Piñera that were verified, two coincided with that of *Chilecheck* and the only one of *El Polígrafo*. Of the three statements of the candidate Alejandro Guillier that were verified, the project coincided in two with *Chilecheck* and the only one by *El Polígrafo*.

Two examples stand out regarding the content of the verification. In the case of Guillier, the three projects coincided in a correlation proposed by the candidate: "Each peso invested in education saves you 6 or 7 pesos in health" (Anatel, 2017). The project of the students and

Figure 2. The disproportionate graphics that the candidate Sebastián Piñera showed. Source: Capture obtained from the first round of the Anatel Debate in 2017.

Chilecheck got the same response of the candidate's team on the original source of the information that corresponded to two studies, one from the World Health Organization and another from the Pan American Health Organization. On the other hand, *El Polígrafo* did not have that information.

The correlation did not appear in the original source, so the students did a review of the academic literature on the subject and a study of the Nobel Prize in Economics, James Heckman, was found. This data was discovered by a student and was then quoted by *Chilecheck*: "Other media that make public speech verification indicated that the proportion indicated by Guillier is related to the work of the American professor James Heckman" (Chilecheck, 2017b). The exercise of the Catholic University was the only one that was published at the time that *Chilecheck* uploaded its article. *El Polígrafo* also mentioned Heckman's study the next day, without referencing previous publications.

The second example is valuable as a fact checking exercise, because it required a two-level verification. The affirmation of the candidate Sebastián Piñera was:

> The ENUSC survey, available through the INE, shows that during our government the victimization rate fell from 30.7% to 22.8%. A million Chileans stopped being victims of crime thanks to this security advance, which during this Government has increased again by 28%. 700 thousand Chileans have been additional victims of crime, be-

> cause of how security has receded. (Anatel, 2017)

When issuing it, he showed a graph whose scale was altered with a very wide margin of difference between 22.8% and 28% (See Figure 2).

The verification of affirmations during the campaign led to all the figures being previously verified and published. Therefore, the analysis could focus on the interpretation of statistics and their graphic representation. In the other two projects, it was agreed to consult the candidate's team and the documentary sources that support the figures. *Chilecheck* had a specialist in statistics, while *El Polígrafo* interviewed an expert in security and the representative of an NGO against crime. The university project interviewed a professor of statistics, a specialist in citizen security, an academic of graphic design and a professor of sociology who also contributed with a similar case of poor representation of data occurred in Venezuela.

This confirms that the methodology of carrying out a work prior to the event that is going to be verified, not only provides a greater possibility of reacting on time, but increases the amount of perspectives to be included in an article, because it grants more time to contact more sources.

The student project was shortlisted in the digital category of the Journalism of Excellence Award organized in Chile by Alberto Hurtado University (UAH Journalism, 2018), competing with *Chilecheck* and confirming the journalistic quality of this work.

6.2. LEARNING OUTCOMES

A self-assessment survey was applied to understand the impact that the exercise had on students. Written authorization was requested from the 26 students to use their responses anonymously in order to generate publishable research and for improvements in the course. All those presented in this work have such authorization. In this section are the main learning outcomes that appeared through the instrument.

The first learning that could be verified was the perception that students had of working in a journalistic dynamic comparable to what they will face in a future work environment, particularly on the day of the verification of the event in which they worked a full day as a team.

The elements that contributed that sense of reality to the exercise were the pressure to deliver with a closing time and that the final product was published in a mass media of high visibility, as these responses indicate:

“While there are things to learn, the day itself is everything to feel that real weight. All that previous work was reinforced during the debate and other instances of listening to the candidate and knowing that she has said it before. So, it is likely that I could carry out such an exercise, again, if that opportunity occurs.”

"It was like working in a press department, the fact that we were with *T13* also felt that it made people take us more seriously and felt very close to what we will be really doing in a few years."

"Learning research methods is highly valued, in addition to working for a real environment helps to do serious work with pressure to get everything done very well."

“I think it is very important, since it is an approach to the reality of the media. It motivates the journalistic vocation since real results can be seen”.

The event itself is relevant, but the journalistic results show that for this to be significant, prior preparation is essential.

Students were asked to evaluate from 1 to 10 how prepared they felt to address the verification exercise the day after the debate. Figure 3 shows that, of the 26 responses, all were between 7 and 10.

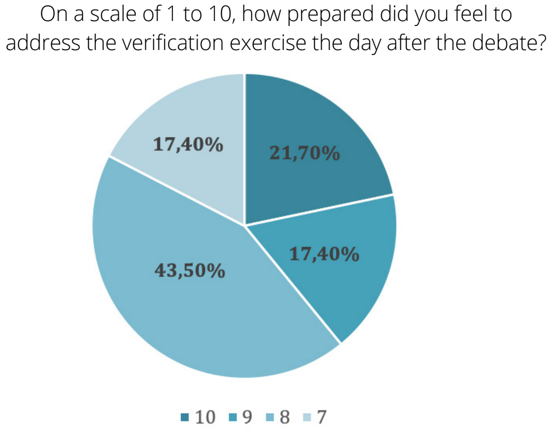

Figure 3. Preparation to face the live verification exercise perceived by students. Source: Own elaboration based on the data provided by the students in the self-assessment survey.

Then, they were asked to measure how prepared they feel to face a new journalistic verification task after completing the exercise. Figure 4 shows that on a scale from 1 to 10, the 26 responses were distributed between 7 and 10.

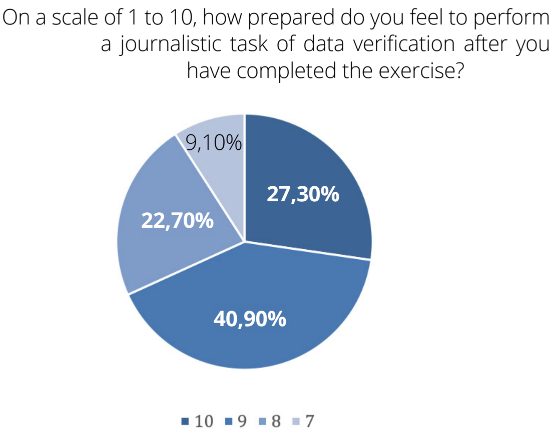

Figure 4. Preparation to face a new verification perceived by students. Source: Own elaboration based on the data provided by the students in the self-assessment survey.

The students' answers to explain this weighting, show the value of the methodological preparation as a situation of transfer of tools in the formative process and applicable to other verification contexts:

"I think it was good to have had previous exercises to verify data. Obviously, after having done two *fact checking* exercises (one before the debate and the other after), confidence increases by practicing."

"I understood the logic of the statement check, which ones are or aren't checkable, and I also used the tools taught to verify if they were true. I understood the logic of source selection and that is why I feel prepared to face this exercise in the future."

"During the semester we discussed what we were going to do, the search for phrases and especially the part of proposing a reporting strategy. I think that helped me a lot to get ready the day after the debate. With a clear idea of what to do and what was important to check and what was verifiable."

"What I rescue most from this exercise is the great amount of knowledge that I acquired in just one semester. I was surprised how we could carry out an investigation in just one day".

Both in the self-assessment and in the final product it is found that the students achieved the learning objective of being able to identify the relevant phrases and sources.

One aspect that showed the self-assessment was that students considered the experience of working with their classmates as a contribution to their learning. In their responses, teamwork is outlined as an essential component for the success of the exercise:

“I think that for us to work as a team, it was very necessary to help each other. Thanks to that we did it. I think that, like the others, I contributed in everything I could to finish a job well done.”

“I think that, like my colleagues, I always had an attitude of cooperation and help when I saw that something was wrong or we should, for example, talk to the candidate’s team. The day of the fact checking we all supported and helped each other”.

This is complemented by the sense of reality that the exercise contributed.

The last aspect that the evaluation showed was that the students became aware of a skeptical attitude towards the speeches of the authorities in a watchdog supervisory role:

"I emphasize mainly the journalistic work of questioning and verifying what many people take for granted, just because an authority says so."

“I learned to distinguish those statements that really matter, to distinguish the phrases of the candidates according to relevance and frequency. I also appreciate that the day of the debate I really saw it with other eyes. More critical and detailed eyes.”

"(I emphasize) Learn to look at the debates according to the specific data they offer and that beautiful words become empty words."

“It helped me to grow journalistically in the face of current events and democratic duty”.

7. DISCUSSION

The theoretical proposal of Lucas Graves (2016), that the *fact checking* is a journalistic genre with its own codes, is reinforced with the results of this project by presenting a product that, from the start, requires following a particular method to reach a result that is determined by an editorial verdict on the claim.

The tension between Social Sciences and Journalism mentioned by Adair (2013), can be seen in the two processes of this exercise that Uscinski (2015) questions, both in the selection of statements and in the final verdict. However, the methodology appears robust, showing a process that privileges the probability of appearance in the debate of the topics addressed by the candidates according to their frequency and supported by a press review that allows to build a broad base of statements where coincidences can be found among journalists of the same team. This was supported by a team editorial discussion about the relevance of these that serves to not benefit specific biases at the time of selection.

Although it could be considered that the exercise is carried out in a privileged space, because it is within the framework of a non-profit university course, that aims to make good Journalism over any other purpose, the results show that, within the political section of the medium that published it, it had high readership, which means that it can also be an attractive product for the audience in a competitive environment.

The coincidences in the selection of affirmations and that one of the investigations was quoted by a commercial medium as *CNN Chile* coinciding with the newspaper *El Mercurio*, is evidence that introducing a university component in the verification ecosystem is a contribution. This is because the number of verifiers working allowed to publish beforehand and thus be a resource for the rest of the community of *fact checkers*, who are not understood as competitors. It is consistent with both the vision of Amazeen (2015) and Mena (2019) where the journalistic criteria and values, supported by a replicable and transparent methodology, keep the arbitrary component that contains an editorial decision under control.

The precariousness of some data used as the original source by the candidates and the relationship that the students established with the campaign teams, evidences the tension exposed by Casero-Ripolles, Izquierdo-Castillo and Doménech-Fabregat (2014), between the political operators and the journalists. In this case, it is even more pronounced because there are no commercial pressures involved or political commitments of any kind. In addition, the advisors of each candidate were not dealing with professionals but with students.

This relationship gives rise to the need to strengthen a culture of political oversight in the campaign period. 2017 was the first year in which there were three projects in parallel verifying the candidates and their teams showed they were not used to being consulted in that way.

The advisors reacted to the students as if they were providing a service and not the opportunity to clarify their sources, which is an alarm for the need to have researchers with greater expertise to develop the technical proposals presented by the candidates for the presidency. In addition, there is a need to maintain these practices in upcoming elections to raise the standard of data with which campaign promises are made.

In the student self-assessment survey, teamwork and the sense of reality emerged spontaneously, confirming that the application of constructivist teaching is functional for a practical long-term and high complexity exercise like this.

The students were able to reflect on their attitude towards the authorities they should cover as journalists, which shows how the watchdog role can effectively be taught and passed through a dynamic of learning by doing, cultivating an attitude of skepticism in future information professionals.

8. CONCLUSION

The main conclusion delivered by this work is that the democratic commitment required by Journalism can be cultivated from the university environment with high standards of work, meeting objectives consistent with the industry in which future communication professionals will perform and making students become aware of the value of establishing a culture of accountability to the authorities.

This becomes especially valuable in countries like Chile, where a culture of accountability is still emerging. The fact that this is part of the academic training of a university student provides a tool that can be systematic to contribute to democracy.

The classroom, understood as a dynamic, collaborative and propelling space for teamwork, serves to design verification processes that the industry cannot afford because of time and resources, from the perspective of the product and learning.

Having a particular event to verify, emerged as an instance valued by students and facilitated to build a methodology with a clear purpose, which closes in the event. This is why it appears as an academic opportunity to start university verification projects.

A future challenge is to innovate in the way of presenting information using graphic and audiovisual resources that can bring the exercise closer to the audience and teach it, articulating that teaching with the one applied in the research methodology.

BILIOGRAPHY

Adair, B. (2013). Responding to a George Mason University press realease about our work. *Politifact*. Retrieved from: http://www.politifact.com/truth-o-meter/blog/2013/may/29/responding-george-mason-university-press-release-a/

Amazeen, M. (2015). Revisiting the Epistemology of Fact-Checking. *Critical Review*, 27(1), 1-22. doi:10.1080/08913811.2014.993890

Anatel. (2017). *Debate presidencial de primera vuelta*. Chile: Anatel.

Bae Brandtzaeg, P. and Følstad, A. (2017). Trust and distrust in online fact-checking services. *Communications of the ACM*, 60(9), 65-71. doi:10.1145/3122803

Casero-Ripollés, A., Izquierdo-Castillo, J. and Doménech-Fabregat, H. (2014). From watchdog to watched dog: Oversight and pressures between journalists and politicians in the context of mediatization. *Trípodos,* 34, 23-40.

Chequeado (2018). Método. *Chequeado*. Retrieved from: http://chequeado.com/metodo/

Chilecheck (2017a). Frases de candidatos. *Chilecheck*. Recuperado de: http://www.chvnoticias.cl/chilecheck/site/tax/port/all/taxport_23___1.html

Chilecheck (2017b). "Cada peso en educación te ahorra 6 o 7 pesos en salud". *Chilecheck*. Retrieved from: http://www.chvnoticias.cl/chilecheck/frases-de-candidatos/alejandro-guiller/cada-peso-en-educacion-te-ahorra-6-o-7-pesos-en-salud/2017-11-07/121308.html

Drobnic, A. (2018). The Principles of the Truth-O-Meter: PolitiFact's methodology for independent fact-checking. *Politifact*. Retrieved from: http://www.politifact.com/truth-o-meter/article/2018/feb/12/principles-truth-o-meter-politifacts-methodology-i/

Dumitru, A., Danciu, B., Plaesu, A., Taranu, A., and Lazaroiu, G. (2011). The role of the media in processes of democratization and consolidation. 2011. *Economics, management, and financial markets*, 6(2), 491-499.

El Sabueso (2015). El sabueso, un proyecto para vigilar el discurso público. *El Sabueso*. Retrieved from: https://www.animalpolitico.com/blogueros-blog-invitado/2015/01/28/el-sabueso-un-proyecto-para-vigilar-el-discurso-publico/

El Polígrafo (2017, 8 de noviembre). "El Polígrafo" chequea las frases de los 8 candidatos durante su último debate. *Diario El Mercurio*. Cuerpo C, p. 3.

Fact Checking UC (2017a). ¿Creíbles, no creíbles o creativos? Verificamos las afirmaciones de los candidatos presidenciales. *T13.cl.* Retrieved from: http://www.t13.cl/noticia/politica/verificacion-afirmaciones-candidatos-presidenciales

Fact Checking UC (2017b). ¿Creíbles, no creíbles o creativos? Verificación de las afirmaciones en el debate Anatel. *T13.cl.* Retrieved from: http://www.t13.cl/noticia/politica/creibles-no-creibles-o-creativos-verificacion-afirmaciones-debate-anatel

Farley, R., Gore, D., Gross, Z., Jackson, B., Kiely E., Robertson, L., Schipani, V., Wallace, C., and Wang, J. (2016). FactChecking the final presidential debate. Factcheck.org. Retrieved from: https://www.factcheck.org/2016/10/factchecking-the-final-presidential-debate-2/

Graves, L. (2016). *Deciding what's true. The rise of political fact-checking in American Journalism*. New York: Columbia University Press.

Gronemeyer, M., and Porath, W. (2015). Un estudio de la homogeneidad entre las posturas editoriales y de las fuentes informativas en la prensa de referencia chilena. *Cuadernos.Info*, 0(36), 139-153. doi:10.7764/cdi.36.567

Iyengar, S. (2011). *Media politics: A citizen's guide* (2nda ed.). New York: Norton.

Jackson-Beeck, M. and Meadow, R. (1979). The triple agenda of presidential debates. *The Public Opinion Quarterly*, 43(2), 173-180. doi:10.1086/268507

Jamieson, K.H. (1992). *Dirty politics. Deception, distraction, and democracy.* New York: Oxford University Press.

Jamieson, K.H. and Adasiewicz, C. (2000). What can voters learn from election debates? En S. Coleman (Ed.), Televised election debates.

International perspectives (pp.25-42). Gran Bretaña: MacMillan Press.

Jamieson, K.H. and Waldman, P. (2003): *The press effect. Politicians, journalists, and the stories that shape the political world.* New York: Oxford University Press.

Kurtzleben, D. (2016). Do fact checks matter? *NPR*. Retrieved from: https://www.npr.org/2016/09/27/495233627/do-fact-checks-matter

Ley N° 20.285. (2008). Retrieved from: https://www.leychile.cl/Navegar?idNorma=276363

Mena, P. (2019). Principles and boundaries of fact-checking: Journalists' perceptions. *Journalism Practice*. 13(6), 657-672. doi:10.1080/17512786.2018.1547655

Minow, N. and LaMay, C. (2008). *Inside the presidential debates*. Their improbable past and promising future. Chicago: The University of Chicago Press.

Mönckeberg, M.O. (2009). *Los Magnates de la Prensa: Concentración de los medios de Comunicación en Chile*. Santiago: Debate.

NPR (2016). Fact check and full transcript of the final 2016 presidential debate. *NPR.* Retrieved from: https://www.npr.org/2016/10/19/498293478/fact-check-trump-and-clinton-s-final-presidential-debate

Núñez-Mussa, E. (2018). Variación y distribución de los roles periodísticos en los debates presidenciales televisados de Chile en 2005 y 2013. (A publicarse) In *Memorias XIV Congreso de la Asociación Latinoamericana de Investigadores de la Comunicación*: 30 de julio al 1 de agosto de 2018. Grupo Temático 16: Estudios sobre Periodismo. Costa Rica: Universidad de Costa Rica.

Pain, P., Masullo Chen, G., and Campell, C. (2016). Learning by doing: Teaching multimedia journalism through coverage of the 50th anniversary of Freedom Summer. *Journalism & Mass Communication Educator*, 71(4), 400-412. doi:10.1177/1077695815613711

Periodismo UAH (2018). Preseleccionados del #PPE15años en su versión digital. Periodismo UAH. Retrieved from: https://medium.com/@periodismouah/preseleccionados-del-ppe15a%C3%B1os-en-su-versi%C3%B3n-digital-1e11fd24b05d

Poynter Institute (2016). *International Fact-Checking Network fact-checkers' code of principles.*Retrieved from: https://www.poynter.org/international-fact-checking-network-fact-checkers-code-principles

Qiu, L. (2016). Fact-checking the first presidential debate. *Politifact.* Retrieved from: http://www.politifact.com/truth-o-meter/article/2016/sep/27/trump-clinton-first-debate-fact-checks/

Ryan, C. (2016). How The New York Times will fact-check the debate. *The New York Times.* Retrieved from: https://www.nytimes.com/2016/09/27/us/politics/new-york-times-debate-coverage.html

Schroeder, A. (2000). *Presidential debates. Forty years of high risk TV*. New York: Columbia University Press.

Schunk, D. (2012). *Teorías del aprendizaje. Una perspectiva educativa* (6ta ed.) México: Pearson Educación.

Singal, J. (2016). There's (more) hope for political fact-checking. *The Cut.* Retrieved from: https://www.thecut.com/2016/11/theres-more-hope-for-political-fact-checking.html

Turcotte, J. (2015). The news norms and values of presidential debate agendas: an analysis of format and moderator influence on question content. *Mass Communication and Society*, 18(3), 239-258. doi:10.1080/15205436.2014.893362

Uscinski, J and Butler R. W. (2013). The epistemology of fact checking. *Critical Review* 25(2), 162-180. doi:10.1080/08913811.2013.843872

Uscinski, J. (2015). The epistemology of Fact Checking (Is still naive): Rejoinder to Amazeen. *Critical Review,* 27(2), 1-10, doi:10.1080/08913811.2015.1055892

OBRA
revista de comunicación
DIGITAL

Universidad de Vic - Universidad Central de Cataluña
Universidad del Azuay

Master's degree programs in Mathematics in Brazil: an application of networks to characterize their titles

Programas de maestría en matemáticas en Brasil: una aplicación de redes para caracterizar sus títulos

Programas de mestrado em Matemática no Brasil: uma aplicação de redes para caracterizar seus títulos

8

ARTICLE

Inácio de Sousa Fadigas

Department of Exact Sciences
Feira de Santana State University

He holds a degree in Civil Engineering from the State University of Feira de Santana (1984), a master's degree in Civil Engineering (Geotechnics) from the Federal University of Paraíba (1987) and a PhD in Knowledge Dissemination (UFBA / UEFS / LNCC / UNEB / IFBA / CIMATEC 2011). He is a full time professor at the Feira de Santana State University. He also has a specialization in Mathematics Education (UEFS 1998) and experience in Mathematics. He coordinated the Omar Catunda Mathematics Education Center of UEFS from 1997 to 2008. He currently participates in the group Fuxicos e Boatos, dedicated to studies and research in Network Science.

fadigas@uefs.br
orcid.org/0000-0002-9330-506X

Trazíbulo Henrique

Department of Exact Sciences
Feira de Santana State University

Graduated in Civil Engineering from the Feira de Santana State University (1984), master's degree in Systems and Computer Engineering from the Federal University of Rio de Janeiro (1991) and has a doctorate in Informatics in Education from the Federal University of Rio Grande do Sul (2003). He is currently an adjunct professor at the Feira de Santana State University. He has experience in education with emphasis on Informatics in Education, acting mainly on the following subjects: informatics, informatics in education, mathematical education, cognitive Science, cyberculture, philosophy, technology and dissemination of knowledge.

henrique@uefs.br
orcid.org/0000-0003-1756-530X

Marcos Grilo Rosa

Department of Exact Sciences
Feira de Santana State University

He has a degree in Mathematics from the Feira de Santana State University (2001), a master's degree in Mathematics from the Federal University of Pernambuco (2004) and a doctorate in Dissemination of Knowledge from the Federal University of Bahia (2016). He is currently an adjunct professor at the Feira de Santana State University. He has experience in Geometry and Topology, Network Theory, Graph Theory and Mathematics Teaching.

grilo@uefs.br
orcid.org/0000-0002-6382-3907

Hernane Borges de Barros Pereira

Department of Education & Computational Modeling
Bahia State University & Centro Universitário SENAI CIMATEC

He completed his doctorate in Multimedia Engineering at the Universitat Politècnica de Catalunya in 2002. He is currently Full Professor at the Department of Education at the State University of Bahia and Associate Professor at the SENAI CIMATEC. He lectures in the Graduate Program in Computational Modeling and Industrial Technology and, also, in the Graduate Program in Knowledge Diffusion. He serves as an ad-hoc consultant to the Brazilian Ministry of Education. Professor Pereira main interests in the fields of science, information technology and innovation lie in the areas of social and complex networks, diffusion of knowledge, software engineering and human computer interaction, through computer modeling techniques.

hbbpereira@gmail.com
orcid.org/0000-0001-7476-9267

RECEIVED: January 10, 2020 / ACCEPTED: January 26, 2020

Abstract

This paper dealt with the networks of *titles of master's dissertations* in mathematics in Brazil. Semantic Networks of Titles (SNT) are analyzed to characterize networks qualitatively and quantitatively. 41 master's courses were selected and the SNDs were built using a network-based approach by cliques, in which the words of the degrees are mutually connected. Louvain's method (algorithm) was applied to detect communities of words. The networks were characterized and grouped by geographical region, which led to infer distinctions between regions depending on whether the word groups were regular or not.

KEYWORDS

Semantic networks, Dissertations, Communities, Titles, Disciplines.

Resumen:

El trabajo realiza un análisis de redes de los títulos de diversos proyectos de maestrías en matemáticas de Brasil. El análisis utiliza redes de títulos semánticos (RST) caracterizados cualitativa y cuantitativamente. Para ello se seleccionaron 41 cursos de capacitación y utilizando el enfoque de redes *de clic, en el que las palabras de los enlaces están conectadas. El método de Louvain (algoritmo) se aplicó para detectar comunidades de palabras. Las redes fueron caracterizadas y agrupadas por región y área geográfica, lo que condujo a inferencias de regiones basadas en regularidad o no, de los grupos de palabras.*

PALABRAS CLAVE:

Redes semánticas, Comunidades, Títulos, Disertaciones, Disciplina.

Resumo:

O trabalho aborda redes dos títulos das dissertações de mestrados em matemática, no Brasil. A análise usa redes semânticas de títulos (RST) para caracterizar qualitativa e quantitativamente as redes. Foram selecionados 41 cursos de mestrado e construídas as RST usando-se a abordagem de redes por cliques, na qual as palavras dos títulos são mutuamente conectadas. Foi aplicado o método Louvain (algoritmo) para detectar as comunidades de palavras. As redes foram caracterizadas e agrupadas por região geográfica, o que levou a inferir distinções entre regiões com base em regularidade ou não dos grupos de palavras.

PALAVRAS-CHAVE

Redes semânticas, Comunidades, Títulos, Dissertações, Disciplinaridade.

1. INTRODUCTION

Master's programs or courses in Mathematics in Brazil are present in all units of the Federation. Dozens of dissertations are produced every year, whose titles are related to the various areas of research in Mathematics. The words that make up the titles, when analyzed together, bring with them information that allows characterizing the main themes of that program or course. The analysis performed here uses semantic networks of titles of the master's dissertations (SNT) to quantitatively characterize the networks and their possible interpretations provide qualitative insertions. The technique is based on the approach of networks by cliques, mainly due to Pereira et al. (2011).

In the literature, no research was found that deals particularly with the subject of the networks of titles of the master's dissertations in Mathematics in Brazil, which makes this study particularly original. To carry out the characterization, general indices of the theory of complex and social networks and a community detection algorithm were used.

Being a country of continental dimensions, the similarities and differences of the networks of dissertation titles were also investigated, grouping the programs/courses according to the geographical region of Brazil in which the host institution is located. This research is driven by the fact that such regions have significant geopolitical, population, economic, cultural and educational differences that could also influence the lines or areas of scientific research in Mathematics.

The text is structured in five sections: Section 2 consists of the referential framework in which the theoretical basis of the research is collected and includes the subsections on semantic networks of titles, detection of network communities; Section 3 presents the methodological procedures that include data collection, networking, and the application of the Louvain method; the Section 4 that presents the results and discussions and includes networks by course and course networks grouped by geographic region; finally, in Section 5 presents the concluding remarks.

2. THEORETICAL FRAMEWORK

2.1. SEMANTIC NETWORKS OF TITLES

The theory of complex networks, or the network science, has a wide application particularly in the semantic field when it deals with to networks in which the vertices are words and the edges are connections between the vertices, determined by some property. In the works of Caldeira *et al*. (2006) and Teixeira *et al*. (2010), who built and analyzed networks of words in written and oral discourses, the vertices are the words that form the sentences and the edges mutually connect the vertices. In the works of Fadigas *et al*. (2009), Pereira *et al*. (2011), Cunha *et al*. (2013), Henrique et al. (2014) and Grilo *et al*. (2017), who studied networks of article titles published in journals, the edges mutually connect the vertices that belong to the same title. In this research, the same pattern is followed: the vertices of the network are the words of the titles of the master's dissertations of mathematics in Brazil, connected to each other by the edges. Therefore, two different titles are connected if they have one or more words in common.

2.2. NETWORK COMMUNITY DETECTION

The term community, from the network perspective, refers to subgroups in which the edges that internally connect the group make it denser than the edges that connect to different groups (Murata, 2010). The concept of communities, as cohesive groups, has its origin in the structural analysis that seeks to identify the connectivity of individuals within and between groups (Wellman, 1997).

Detecting communities in networks is not a simple task, especially when it comes to large networks. Just to name a few works, Girvan and Newman (2002) proposed a method to find communities using the idea of centrality indices to delimit the contour of the community. For complex networks, Capocci *et al*. (2005) developed an algorithm to detect communities based on spectral methods and take into account the weight at the edges and the orientation of the connections. Along the same lines, Clauset, Newman and Moore (2004) present a hierarchical agglomeration algorithm that aims to be fast in the detection of communities in large networks.

The main objective of community detection is to separate a network into groups of vertices with few connections between them. A measure used for this purpose is modularity, which identifies the contrast in edge density within the group, compared to the expected value for a random distribution of edges, that is, it measures the quality of each partition.

An expression to calculate a number that expresses modularity in a network can be found, for example, in Barabási (2016), and is given by:

$$M = \sum_{c=1}^{n_c} \left[\frac{L_c}{L} - \left(\frac{k_c}{2L} \right)^2 \right] \quad (1)$$

In the expression, n_c is the number of communities, L_c is the number of edges in the community, L is the total number of edges and k_c is the total number of degrees of the vertices in the community. The higher the value of M (which does not exceed 1), the better the partition of the community structure. The value of M = 0 expresses that the total network is a simple community. Negative modularity occurs if each vertex belongs to separate communities. To show communities of words in the networks of titles of the master's dissertations studied in this work, we opted for the Louvain Method (Blondel et al., 2008), which has a fast and good precision algorithm and the detection of communities is based on the measure of modularity. The algorithm implemented in Pajek (Batagelj and Mrvar, 1998) introduces a resolution parameter r, which converts Equation 1 into:

$$M = \sum_{c=1}^{n_c}\left[\frac{L_c}{L} - r\left(\frac{k_c}{2L}\right)^2\right] \quad (2)$$

3. METHODOLOGY

3.1 DATA COLLECTION

The preliminary stage of data collection consisted of listing the courses recommended by CAPES (Coordination of Superior Level Staff Improvement) linked to the Ministry of Education of Brazil (MEC), after consulting the official website http://www.capes.gov.br/ (accessed September 2013). The search was limited to the large area of "Exact and Earth Sciences" in the assessment area of "Mathematics (Mathematics / Probability and Statistics)". Of the 45 courses found on the site, the 42 selected courses were specific to math. In the next step, it was discovered that in one of the courses there were no defended dissertations yet, so the final number of courses was 41, as shown in Table 1.

n.	Course name	IHE	FU
1	Mathematics	FUFPI	PI
2	Mathematics	IMPA	RJ
3	Mathematics	PUC-RIO	RJ
4	Applied and Computational Mathematics	UEL	PR
5	Mathematics	UEM	PR
6	Mathematics	UFABC	SP
7	Mathematics	UFAL	AL
8	Mathematics	UFAM	AM
9	Mathematics	UFBA	BA
10	Mathematics	UFC	CE
11	Mathematics	UFCG	PB
12	Mathematics	UFES	ES
13	Mathematics	UFF	RJ
14	Mathematics	UFG	GO
15	Mathematics	UFJF	MG
16	Mathematics	UFMA	MA
17	Mathematics	UFMG	MG
18	Mathematics and Statistics	UFPA	PA
19	Mathematics	UFPB_JP	PB
20	Mathematics	UFPE	PE
21	Applied Mathematics	UFPR	PR
22	Mathematics	UFRGS (ma)	RS
23	Applied Mathematics	UFRGS (maplic)	RS
24	Mathematics	UFRJ (ma)	RJ
25	Applied Mathematics	UFRJ (maplic)	RJ
26	Pure and Applied Mathematics	UFSC	SC
27	Mathematics	UFSCar	SP
28	Mathematics	UFSM	RS
29	Mathematics	UFU	MG
30	Mathematics	UFV	MG
31	Mathematics	UNB	DF

32	Applied and Computational Mathematics	UNESP_PP	SP
33	University Mathematics	UNESP_ RC	SP
34	Mathematics	UNESP_ SJRP (ma)	SP
35	Applied Mathematics	UNESP_ SJRP (maplic)	SP
36	Mathematics	UNICAMP (ma)	SP
37	Applied and Computational Mathematics	UNICAMP (macomp)	SP
38	Applied Mathematics	UNICAMP (maplic)	SP
39	Mathematics	USP (ma)	SP
40	Applied Mathematics	USP (maplic)	SP
41	Mathematics	USP/SC	SP

Table 1. List of courses used in the research.

Table with the name of the course, Institution of Higher Education (IHE) to which it is linked and Federative Unit (FU) of the Institution unit.

For the construction of the networks, the main source for obtaining the data were the CAPES indicator books on the site: http://conteudoweb.capes.gov.br/conteudoweb/CadernoAvaliacaoServlet. On the site are the notebooks from 1998 to 2012, in which the assessments of the programs were carried out every three years and served as the basis for the compilation. With the change in the assessment by four-year period, the 2016 data were not considered. Once the period of interest and the desired institution were chosen, the area to be analyzed was investigated, in this case, Mathematics / Probability and Statistics. The group entitled "*TE-Teses e Dissertações*" (Thesis and Dissertations) when activated shows a PDF document with several delimited fields, from which [author], [title] and [line of research] were obtained. Data from all fields was transferred to an organized spreadsheet with one field for each column. The procedure was successful for each course from 1998 to 2012.

3.2 NETWORK CONSTRUCTION

The semantic networks of titles of the master's dissertations were constructed from the data sheet. Each title is copied on a line in a text file that is subject to two types of treatment: the first is to eliminate punctuation marks such as commas, periods, hyphens and other signs. The second is more complex and uses a routine developed by Caldeira (2005) that uses three programs: (i) the UNITEX package, available at http://www-igm.univ-mlv.fr/unitex/; (ii) the Ambisin program, developed by Caldeira (2005) to address issues such as the elimination of ambiguities, the elimination of grammatical words and the separation of flexed or canonical word forms; (iii) the NetPal program, developed by Professor Dr. José Garcia Vivas Miranda and his collaborators, which generates the network in the appropriate format for the use of the Pajek program, created by Vladimir Batagelj and Andrej Mrvar (Batagelj and Mrvar, 1998).

After the construction of the networks for each course, the files were grouped according to the geographical region in which the headquarters of each program or course is settled. This division allows to investigate regional characteristics in the election of titles of the master's dissertations.

3.3. APPLICATION OF THE LOUVAIN METHOD

The algorithm consists of optimizing the modularity to find the partition that results in a higher modularity value. The full description of the algorithm, summarized here, is found in Blondel *et al*. (2008). The algorithm is based on two steps that must be iteratively performed. In the first step, all vertices are considered to form their own community, that is, we have *N* vertices forming *N* communities. In the second step, an ordered search is performed on all vertices from 1 to *N*, so that the neighboring vertex is incorporated into that community if there is an increase in modularity. This step is performed iteratively until maximum local modularity is achieved. In this step, each vertex can be visited several times. Once the maximum location has been reached, the algorithm builds a new network in which the vertices are the communities found with the weights of the ties between the communities calculated as the sum of the total weights between the vertices of those communities. The second step, as noted, is repeated iteratively (on the network whose vertices represent communities), which leads to a hierarchical decomposition of the network. This makes the algorithm suitable for handling large networks.

3.3.1. IMPLEMENTATION OF THE PAJEK ALGORITHM

There is a description of how to use the Louvain method implemented in Pajek on the Andrej Mrvar website, http://mrvar.fdv.uni-lj.si/pajek/community/Community-DrawExample.htm. Without going into technical details inherent to the program, only some pieces of information we consider relevant are highlighted in this study:

1. There are two ways to access different routines of the algorithm. The first, called Multi-LevelCoarsening + Single Refinement, only refines the partition obtained at the last level (the least refined partition). The second, called Multi-LevelCoarsening + Multi-LevelRefinment, differs from the first in that it makes coarse and refined partitions for each level obtained.

2. It is recommended to test the algorithm for different values of the resolution parameter *r* (Equation 2), which by default value is 1. High resolution values produce a large number of communities, while low values (greater than 0) produce few communities.

3. For best results, even without maximizing modularity, it is suggested to compare the partitions obtained in two rounds of algorithm execution with the same resolution parameter to assess the correlation. Pajek program has routines for this evaluation: Cramer's V, Rajski and the adjusted index of Rand. If the correlation between the two partitions is small, the number of communities is probably not correct and, therefore, the algorithm must be run with another value (greater or lesser) of the resolution parameter *r*. It is also suggested to use the highest correlation index found, even if the modularity is not the greatest.

These procedures were used for the semantic networks of titles of the master's dissertations, separated by geographical regions, as well as for the total network, that is, for the network with all the titles of the master's dissertations that form the largest connected component.

4. RESULTS AND DISCUSSION

4.1 NETWORKS BY COURSE

Table 2 shows the main quantities found to characterize the semantic networks of titles of the master's dissertations for each course.

As can be deduced from Table 2, approximately half of the courses (21 courses) produced dissertations during the entire collection period. Of the remaining 20, two courses of Applied Mathematics (from UFRJ and UNESP-SJRP) were closed before 2012 and 18 courses began after

IHE	Period	QT	QV	QA(p=1)	QA(p>1)	QC	% MC	DR
FUFPI	2010-2012	21	93	309	39	5	51.61	0.370
IMPA	1998-2012	51	235	918	72	8	87.23	0.408
PUC-RIO	1998-2012	108	380	1472	103	3	98.16	0.349
UEL	2009-2012	16	95	394	37	3	86.32	0.565
UEM	2001-2012	101	255	984	260	7	86.32	0.285
UFABC	2009-2012	20	94	289	8	4	72.34	0.746
UFAL	2005-2012	50	173	564	50	7	87.28	0.405
UFAM	2002-2012	57	208	752	65	6	88.94	0.385
UFBA	1998-2012	136	353	1299	142	3	98.02	0.330
UFC	1998-2012	163	369	1513	213	3	98.10	0.285
UFCG	2004-2012	75	248	1115	175	4	93.55	0.307
UFES	2008-2012	28	124	405	40	7	77.42	0.533
UFF	1998-2012	93	275	784	82	7	94.18	0.367
UFG	1998-2012	146	402	1699	244	4	97.26	0.293
UFJF	2011-2012	8	37	112	6	3	51.35	0.585
UFMA	2012-2012	4	18	63	1	3	61.11	1.000*
UFMG	1998-2012	145	400	1492	179	5	95.75	0.198
UFPA	2005-2012	109	396	2021	359	1	100.00	0.294
UFPB_JP	1998-2012	179	452	1934	341	1	100.00	0.279
UFPE	1998-2012	108	334	1143	80	5	96.11	0.351
UFPR	2004-2012	42	164	541	46	5	92.68	0.425
UFRGS (ma)	1998-2012	127	405	1635	166	5	96.30	0.267
UFRGS (maplic)	1998-2012	205	618	3483	516	2	98.87	0.198
UFRJ (ma)	1998-2012	121	352	1259	186	6	96.31	0.341
UFRJ (maplic)	1998-2009	48	184	621	41	4	86.41	0.415
UFSC	1998-2012	94	303	1253	150	6	95.38	0.330
UFSCar	1998-2012	102	315	1218	172	6	94.29	0.323
UFSM	2008-2012	24	112	435	36	1	100.00	0.558
UFU	2009-2012	28	133	485	38	5	84.96	0.375
UFV	2009-2012	23	83	205	20	5	84.34	0.488
UNB	1998-2012	198	566	2649	374	4	98.76	0.240
UNESP_PP	2012-2012	7	52	246	4	1	100.00	0.553
UNESP_RC	2010-2012	38	108	303	20	5	91.67	0.442
UNESP_SJRP (ma)	1998-2012	167	418	1637	220	5	96.89	0.250
UNESP_SJRP (maplic)	1999-2006	70	218	972	128	1	100.00	0.309

UNICAMP (ma)	1998-2012	188	463	1743	187	6	97,84	0.244
UNICAMP (maplic)	1998-2012	137	519	2487	195	3	98,46	0.262
UNICAMP (ma-comp)	2007-2012	65	251	1215	94	6	91,63	0.266
USP (ma)	1998-2012	150	411	1380	131	3	98,54	0.291
USP (maplic)	1998-2012	87	330	1345	66	3	97,58	0.370
USP/SC	1998-2012	142	358	1433	199	5	96,93	0.296

Table 2. Quantities for semantic networks of titles of the master's dissertations per course.

Note: *QT*- number of titles; *QV* - number of vertices; *QA(p* = 1) - number of edges with weight 1; *QA*(*p*> 1): number of edges with a weight greater than 1; % *MC*: percentage of the largest component (in terms of number of vertices); *DR*-reference diameter.

(*) The network with a reference diameter of 1 is a unique case of SNT-UFMA that has only 4 titles, 3 of which form the largest component as a clique.

1998. These amounts reflect the growth in the offer of Masters in Mathematics in the selected period.

The number of titles of the master's dissertations varies between 4 and 205 titles, that is, there is a great variation in these amounts, mainly influenced by the period of operation of the course. For example, the Master in Mathematics course at UFMA presents only 4 titles of the master's dissertations because this course was implemented in 2012, the final collection date of three-year period. On the other hand, the variation in the number of titles of the master's dissertations for courses in operation from the beginning (1998) to the end (2012) of the collection, shows the difference in production in them.

The size of each network given by the number of vertices shows that from the point of view of complex networks, they are not large networks, the largest network has 618 vertices (UFRGS - Applied Mathematics). The average size of the titles of the master's dissertations, which is the ratio between the number of vertices (n) and the number of titles of the master's dissertations (n_q), varies between 2.26 and 7.43. This ratio reveals the greater or lesser diversity of words in the choice of titles of the master's dissertations. Comparing SNT-IMPA that has 51 titles and 253 different words with SNT-UFC that has 163 titles and 369 different words, the analysis of the n/n_q ratio (SNT-IMPA: 4.61; SNT-UFC: 2.26) shows that a program may have fewer titles of the master's dissertations than another, but proportionally, its vocabulary is more diverse in comparison to the number of titles used.

Table 2 also provides information on the number of connections between the vertices, that is, the number of connections established between the words of the titles of the master's dissertations for each course. As the number of times a link between two words is considered, columns 3 and 4 differentiate the links that occurred only once (weight 1) from the links that occurred more than once (weight greater than 1). The results show the predominance of connections with weight 1, that is, most connections between words occur only once.

The number of components is one of the parameters that indicates how fragmented the network is, that is, how many groups of words are not linked. It can be seen in Table 2 that of the 41 networks, only 5 of them (approximately 12%) have only 1 component. These data would indicate the greater or lesser diversity in the choice of word groups to compose the titles of the master's dissertations. However, the percentages of the largest components, which indicate the number of words of these in relation to the total network, show that the smaller components are not significant for this interpretation. In fact, it is observed that the size of the largest component is above 90% of the vertices in 29 courses (70.7%). It is also observed in the remaining networks, that is, with the largest component with less than 90% of vertices, all are incomplete with respect to the period collected (1998 to 2012). Therefore, there is a tendency for this percentage to grow. Figure 1 shows the relationship between the number of titles of the master's dissertations and the percentage size of the largest component of the SNT.

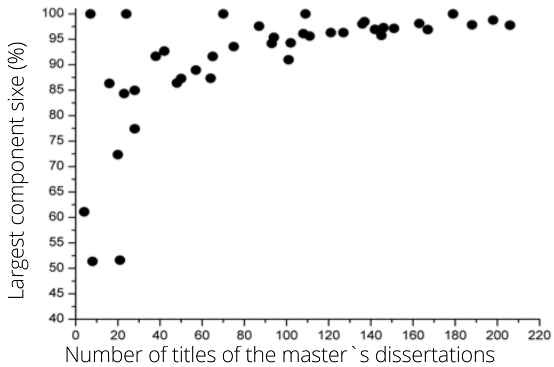

Figure 1. Graph of the size distribution of the largest component in the number of titles of the master's dissertations.

Figure 1 shows that networks with a greater number of titles of the master's dissertations tend to exhibit larger components with sizes close to 100%. Therefore, if two networks with comparable titles amounts show a significant difference in the size of the largest component, this can be attributed to the choice of different topics in the SNT with a lower percentage of the component. For example, SNT-UEM (101 titles of the master's dissertations; largest component 86.32%), compared to

SNT-UFScar (102 titles of the master's dissertations; largest component 94.29%) can show that it presents more diverse themes. This indication is qualitatively associated with the fact that the UEM program is highlighted in three areas (algebra, analysis and geometry) while the UFScar program is highlighted in only two areas (analysis and geometry).

Another network parameter that can be used to characterize programs or courses is the diameter of the network. The diameter of a connected network is the longest of all the calculated geodesic distance in a network. In the case of connected SNT, it represents the maximum space between two words present in different titles of the master's dissertations. Therefore, it refers to the diversity of topics used in the formation of titles of the master's dissertations. As Fadigas and Pereira (2013) define, the reference diameter is a normalization of the diameter relative to the largest possible diameter in a minimally connected clique structure, that is, each clique is connected to another by a single vertex. This structure is called "line structure". For SNT, Table 2 shows that only 1% of these are in the lowest range of the reference diameter (0 to 0.25), which corresponds to a "star structure" and, therefore, to a more cohesive network in the approximation between their titles of the master's dissertations. However, the reference diameter is influenced by the size of the network, that is, by the number of titles. To make comparisons possible, Figure 2 shows the variation of the reference diameter with the size of the titles of the master's dissertations for the SNT. According to Figure 2, there is a tendency to reduce the reference diameter with the increase in the number of titles. Therefore, the larger values of the reference diameter are more influenced by the smaller number of titles than by a possible diversity of vocabulary, for example.

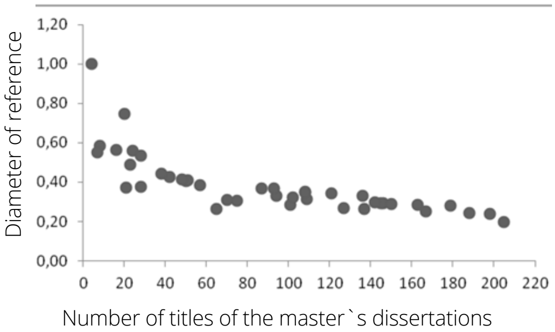

Figure 2. Graph of the variation of the reference diameter with the number of titles of the master's dissertations for the SNT.

4.2. COURSE NETWORKS GROUPED BY GEOGRAPHICAL REGION

4.2.1. GENERAL QUANTITATIVE DATA

We grouped the networks by geographic region of Brazil to have both a quantitative and qualitative macro approach to the semantic networks of titles of the master's dissertations in Mathematics. This allowed us to analyze the differences and similarities between the networks and infer some regional characteristics. For example, the information in Table 2 allows us to infer that the programs located in the Southeast Region were those that produced the most dissertations (1826), followed by the Northeast Region (736), the South.

Region (609), the Midwest Region (344) and the Northern Region (166). However, it is interesting to note that the average number of dissertations per region, when calculated by the number of courses, presents the Midwest Region as the one that produces the most (172 per course), while the other regions have an average between 83 and 92 dissertations per course, with the North Region as the least productive (83 per course) and tied with the Southeast Region. When the calculation takes into account the periods of each course, the Southeast Region presents a small increase in relation to the North Region (7.97 vs. 7.90), while the other regions continue in the same order of production. The fact that the Midwest region presents itself as the most productive is strongly linked to the production of UnB (Table 3).

The number of vertices in the network indicates the number of different words used in the set of titles of the master's dissertations, that is, excluding repeated words from that amount. To quantify word repetitions when the networks of each program come together to form the networks by region, we present an index that quantifies the reduction of common vertices. This index is calculated using Equation 3, in which S_(n_0) is the sum of the vertices of the network for each program and n is the total number of vertices for the network of programs in that region.

$$IRV = \frac{S_{n_0} - n}{S_{n_0}} \quad (3)$$

Table 3 shows some quantities for networks by region, in which it is observed that the network in the Southeast Region is the one with the highest *IRV*. The value (55.2%) indicates that more than half of the words used in the titles of the master's dissertations form a vocabulary from a source common to all courses in that region. When the number of titles is taken into account, the parameterization indicated by the *IRVp* shows that the SNT of the Southeast Region has the lowest index, while the others have indices in the same order of magnitude. This means that there is a greater "disciplinarity" in terms of vocabulary chosen for titles of

Region Network	*NCourse*	*QT*	*NComp*	*%MC*	*n*	*IRV*	*IRVp*
Midwest	2	344	4	98.991	793	0.180	0.053
Northeast	8	736	3	99.674	1228	0.398	0.054
North	2	166	2	99.457	552	0.086	0.052
Southeast	22	1826	14	98.492	1295	0.552	0.030
South	7	609	5	98.996	2569	0.337	0.055

Table 3: Network characterization with emphasis on components.

Note: *NCourse* - number of courses; *QT*- number of titles; *NComp*- number of components; % *MC* -percentage of the largest component (in terms of number of vertices); *n* - number of vertices of the network; *IRV*- vertices reduction index; *IRVp* - parameterized vertex reduction index (*IRV / QT*).

the master's dissertations in the Southeast Region.

4.2.2. COMPONENTS AND COMMUNITY OF WORD

Information on the number of components of each network per region, combined with the percentage of vertices of the largest component (Table 3), indicates the behavior in relation to groups of words closer to those separated from other groups of words. Therefore, the presence of more than one component in the network means that there are groups of isolated words, for some reason that is peculiar to each network. As shown in Table 3, the largest component size for all networks is around 99%. This shows the predominance of the largest component over the smallest, that is, for all networks there is a predominance of a large group of words linked together. Therefore, there is no considerable difference in the topology of the networks in terms of the number of components and the size distribution of the components, indicating a uniformity in the choice of vocabulary used in the titles of the master's dissertations in each group of courses by region.

Although the analysis of the distribution of quantity and size of the components to provide a first approximation in terms of groups, it does not provide details about the characteristics of the largest component. The purpose of applying the algorithm to detect communities in semantic networks of titles of the master's dissertations by geographic region is to detect similarities and differences between the largest component of the networks and infer interpretations for the results. Word communities are characterized by having a greater number of internal links than expected for a random distribution of edges in the network.

The networks were built only with the vertices of the largest connected component for a more precise analysis of the formation of word communities, which in this case is representative of the networks as a whole considering the percentages of the largest components, according to Table 3. The algorithm of the Louvain Method (Blondel *et al.*, 2008) is incorporated into the Pajek program (Batagelj eMrvar, 1998), used for community research. Its application, for more reliable results, requires the investigation of the optimal resolution r, a parameter that directly affects the modularity value and the number of communities: lower values result in a smaller number of communities.

In turn, modularity indicates the quality of the division of communities, high values (maximum

Networks by Region	*R*	*M_r*	Cramer's V Index	Communities	*%MCommon*
Midwest	0.25	0.751963	1.000000	3	96.56
Northeast	0.25	0.750069	1.000000	2	99.67
North	0.25	0.815102	0.974503	3	45.72
Southeast	0.10	0.900062	1.000000	2	98.89
South	1.50	0.399884	0.759705	19	9.91

Table 4: Quantities related to community detection.

1) imply dense connections between the vertices within the group and sparse connections between the vertices of different groups. However, modularity alone does not result in a precise determination of the number of groups in the network, since the same resolution can result in different modularities and group quantities when the algorithm is performed again. With respect to the implementation in Pajek and the application in the networks, tests were carried out to optimize the application of the algorithm following the guidelines described in subsection 2.3. For each network analyzed, the resolution values of 0.1; 0.2; 0.25; 0.5; 1.0; 1.25; 1.5 and 1.75 were used and the resolution that resulted in a higher value of the statistical index known as Cramer's V, which measures the correlation in the calculation of modularities for pairs of equal resolutions, was chosen. Columns 2 to 4 of Table 4 show the results for networks by region.

It can also be seen in Table 4 that, from the point of view of groups or communities of words, the networks can be divided into three categories: the first category includes the networks of the Midwest, Northeast and Southeast with a low number of communities (2 or 3) and a community with almost all vertices (more than 96.5%). In the second group is the network of the North region with only 3 communities but with the size of the communities well distributed (the other two smaller communities have percentages of 16.39% and 37.89%). Finally, the South Region network is in the third category with 19 communities with well distributed sizes between 1.79% and 9.91% (largest community included). It is worth mentioning that the last network is not very stable, considering resolution 1.5, resulted in a higher value of the Cramer's V index and the number of communities can still vary. For the other networks, the same number of communities was found in the different executions of the algorithm for optimal resolution.

From the point of view of the words used in the titles of the master's dissertations, the networks of the northeast, southeast and midwest regions behave as a cohesive group in which the connections between the words within a community are greater than expected, if the distribution was random. Modularity values between 0.750 and 0.900 confirm this behavior. In the case of the northern region network, this characteristic can also be inferred but the internal cohesion indicated by the modularity of 0.815 implies the distinction of three groups of words due to a certain homogeneity in the group sizes. The network of the southern region has the lowest modularity value (0.395), which indicates a weaker internal cohesion of the groups, that is, the connections are close to those expected for a random distribution of connections between words. From the point of view of modularity, the word network of the southeast region is the one with the best quality of community division, while the network of the southern region is the one with the weakest division.

There is a contrast taking into account the number of courses for these last two regions: the 22 courses in the southeast region are more homogeneous in terms of choosing the words of the titles of the master's dissertations compared to the 7 courses in the south region that are more heterogeneous.

5. CONCLUDING REMARKS

The analysis made from the semantic networks of titles of the master's dissertations for each of the programs/courses reveals that there is a diversity of operational periods, number of titles, number of vertices, amount of weighted edge, percentage of the largest component and reference diameter. However, such diversity does not prevent inferences about the long-term behavior of networks such as the asymptotic growth of the percentage of the largest component (tends to 100%) with the increase in the amount of titles of the master's dissertations and, therefore, in the amount of words (vertices) that form them.

The behavior of the reference diameter with the increase in the number of titles of the master's dissertations shows that there is a trend in all networks that, as new titles are added, the maximum geodetic distance between two words in the network decreases.

When the comparison is made with the SNT grouped by geographic region, it is observed that there is also a differentiation in the aspect of academic production, reflected by the number of titles of the master's dissertations in the regions and with emphasis on the southeast region, in absolute terms. However, the fact that the midwest region has only two institutions surveyed, including a remarkably productive institution like UnB, highlights it in terms of average productivity. In terms of the vocabulary used in the titles, the network of titles of the master's dissertations in the southeast region is less diversified, indicating greater "disciplinarity". The application of the Louvain method to detect communities proved to be appropriate to differentiate networks with greater or lesser diversity of cohesion between groups of words that formed the titles. The behavior of the south region network, which has a greater diversity of cohesion, is expressed by the greater number of communities and the lower modularity.

The use of Louvain's algorithm to detect communities proved satisfactory when used in semantic networks of titles of the master's dissertations, since it can identify and quantify the groups of words with greater internal cohesion, whose interpretation is initially linked to the discipline. This method can be explored together with other quantitative and qualitative analyzes that take into account the research lines of each course/program associated with the areas defined by the organizations that promote scientific and technological research such as the National Council for Scientific and Technological Development (CNPq) in Brazil, in order to identify issues of regional or national interest; if these are in line with what is being studied in the world and if there are focal points of characteristic studies in the country that justify more or less specific vocabularies.

BIBLIOGRAPHY

Barabási, A. L. (2016). *Network science*. Cambridge university press.

Batagelj, V. and Mrvar, A. (1998). Pajek-program for large network analysis. *Connections*, 21(2), 47-57.

Blondel, V. D., Guillaume, J. L., Lambiotte, R., and Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of statistical mechanics: theory and experiment*, 2008(10), P10008.

Caldeira, S. M. G. (2005). *Caracterização da Rede de Signos Linguísticos: Um modelo baseado no aparelho psíquico de Freud*. Master in Computer Modeling, Fundação Visconde de Cairu.

Caldeira, S. M., Lobao, T. P., Andrade, R. F. S., Neme, A., and Miranda, J. V. (2006). The network of concepts in written texts. *The European Physical Journal B-Condensed Matter and Complex Systems*, 49(4), 523-529. doi:10.1140/epjb/e2006-00091-3

Capocci, A., Servedio, V. D., Caldarelli, G., and Colaiori, F. (2005). Detecting communities in large networks. *Physica A: Statistical Mechanics and its Applications*, 352(2-4), 669-676. doi:10.1016/j.physa.2004.12.050

Clauset, A., Newman, M. E. J., and Moore, A. (2004). Finding community structure in very large networks. *Physical review E*, 70(6), 066111.

Cunha, M. V., Rosa, M. G., Fadigas, I. S., Miranda, J. G. V., and Pereira, H. B. B. (2013, August). Redes de títulos de artigos científicos variáveis no tempo. In *Anais do II Brazilian Workshop on Social Network Analysis and Mining* (pp. 194-205). SBC.

Fadigas, I. S., Henrique, T., Senna, V., Moret, M. A., and Pereira, H. B. B. (2009). Análise de redes semânticas baseada em títulos de artigos de periódicos científicos: o caso dos periódicos de divulgação em educação matemática.

Fadigas, I. S. and Pereira, H. B. B. (2013). A network approach based on cliques. *Physica A: Statistical Mechanics and its Applications*, 392(10), 2576-2587. doi:10.1016/j.physa.2013.01.055

Girvan, M. and Newman, M. E. (2002). *Community structure in social and biological networks*. *Proceedings of the national academy of sciences*, 99(12), 7821-7826. doi:10.1073/pnas.122653799

Grilo, M., Fadigas, I. S., Miranda, J. G. V., Cunha, M. V., Monteiro, R. L. S., and Pereira, H. B. B. (2017). Robustness in semantic networks based on cliques. *Physica A: Statistical Mechanics and its Applications*, 472, 94-102. doi:10.1016/j.physa.2016.12.087

Henrique, T., Fadigas, I. S., Rosa, M. G., and Pereira, H. B. B. (2014). Mathematics education semantic networks. *Social Network Analysis and Mining*, 4(1), 200. doi:10.1007/s13278-014-0200-x

Murata, T. (2010). Detecting communities in social networks. In *Handbook of social network technologies and applications* (pp. 269-280). Springer, Boston, MA. doi:10.1007/978-1-4419-7142-5_12

Pereira, H. B. B., Fadigas, I. S., Senna, V., and Moret, M. A. (2011). Semantic networks based on titles of scientific papers. *Physica A: Statistical Mechanics and its Applications,* 390(6), 1192-1197. doi:10.1016/j.physa.2010.12.001

Teixeira, G. M., Aguiar, M. S. F. D., Carvalho, C. F., Dantas, D. R., Cunha, M. V., Morais, J. H. M., ... and Miranda, J. G. V. (2010). Complex semantic networks. *International Journal of Modern Physics C*, 21(03), 333-347. doi:10.1142/S0129183110015142

Wellman, B. (1997). Structural analysis: From method and metaphor to theory and substance. *Contemporary Studies in Sociology*, 15, 19-61.