Comunicar

Media Education Research Journal, n. 66, vol. XXIX
www.comunicarjournal.com

Public schools for educational transformation in the Knowledge Society

Escuelas públicas para la transformación en la Sociedad del Conocimiento

English Edition

© COMUNICAR, 66, XXIX

MEDIA EDUCATION RESEARCH JOURNAL
REVISTA CIENTÍFICA DE COMUNICACIÓN Y EDUCACIÓN

ISSN: 1134-3478 / DL: H-189-93 / e-ISSN: 1988-3293
n. 66, vol. XXIX (2021-1), 1st Quarter, January, 1st, 2021

INDEXED INTERNATIONAL SCIENTIFIC JOURNAL

https://www.revistacomunicar.com/index.php?contenido=ranking-indexaciones&idioma=en

JOURNAL CITATION REPORTS (JCR)

JCR 2019 (2020-21): Q1. Impact Factor: 3.375. 5 Year Impact Factor 3.830. Inmediacy Index: 0.775; Eigenfactor Score: 0.000740; Communication: Q1 (13th position from 92, top Spanish journal; Education: Q1 (22th position from 263), the first Spanish and Iberoamerican journal.
SOCIAL SCIENCES CITATION INDEX: The top journal in Spanish in Communication since 2007.

SCOPUS

CITESCORE 2019 (2020-21): (5.60): Q1 en Cultural Studies (2nd position from 1,002) (percentile 99). Q1 in Communication: 19th from 387 (percentile 95). Q1 in Education (43th position from 1,254) (percentile 96).
SCIMAGO JOURNAL RANK: SJR 2019 (2020-21): 1.092: Q1 in Cultural Studies, Communicationnal and Education (first journal in Spanish language in Education and Cultural Studies and second journal in Communication)

RECYT (FECYT-MEC)

FECYT Ranking 2020: Education: 1st of 56 journals (99.82 points out of 100) (top 1%); Communication, Information and Scientific Documentation: 1st of 16 journals (99.82 points out of 100) (top 1%).
FECYT 2020 Seal of Quality Excellence (12 indicators).

GOOGLE SCHOLAR

2020: Top 100 de Google: 2nd position (from 100) in the Spanish ranking of all research journals areas.
H5: 38. Mean H5: 50. In 2020-07-21: H: 79; H5: 68 (37,178 accumulated citations)
Acording EC3 Reports, 2018 (UGR): H5 Index (2013-2017); 1st position in Education (out of 165; H5: 38); 1st position in Communication (out of 51; H5: 38).

DIALNET METRICS

Q1: COMMUNICATION 2018 (2020): 1st position (from 223); IF: 3.275 (655 cites)
Q1: EDUCATION 2018 (2020): 1st position (from 55); IF: 3.275 (655 cites)

CIRC (INTEGRATED CLASSIFICATION OF SCIENTIFIC JOURNALS) (EC3 Metrics)

2020, Level A+ (highest rated)

REDIB (CSIC) (Ibero-American Innovation and Scientific Knowledge Network)

2020: 2nd position among 1,160 select journals from all areas. Rating: 56.837

ERIH+

Level INT2 (2020)

PUBLISHED BY: GRUPO COMUNICAR EDICIONES
- www.comunicarjournal.com
- www.grupocomunicar.com

- Administration: info@grupocomunicar.com
- Staff: director@grupocomunicar.com
- Mail box 527. 21080 Huelva (Spain)

- COMUNICAR is a member of CEDRO (Spanish Centre for Reprographic Rights).

- COMUNICAR is a quarterly scientific publication, published in January, April, July and October.

- COMUNICAR journal accepts and promotes online institutional exchanges with other scientific journals.

© COMUNICAR is a patented trademark registered at the Spanish Patents and Trademarks Office, n. 1806709,

INTERNATIONAL CO-EDITIONS

- ENGLISH EDITION (https://bit.ly/2ZN0mjz)
- PORTUGUESE EDITION (https://bit.ly/2Blt8P2)
- CHINESE EDITION (https://bit.ly/3g0h8BL)
- LATIN-AMERICAN EDITION (https://bit.ly/3fQB5uG)
- RUSSIAN EDITION (https://bit.ly/3hgc9g8)

PRINTED BY: Estugraf. Madrid (Spain)

© Reproduction of any text in COMUNICAR requires authorization from CEDRO or the publisher.

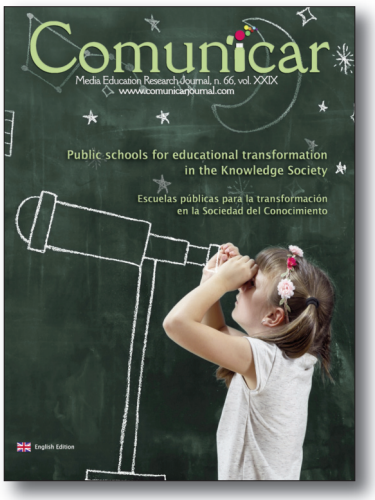
E-SHOP: www.revistacomunicar.com/index.php?contenido=tienda

CONTENTS

Comunicar, 66, XXIX (2021-1)

Public schools for educational transformation in the Knowledge Society

Escuelas públicas para la transformación en la Sociedad del Conocimiento



DOSSIER

THEMATIC EDITORS

Dr. Ola Erstad, University of Oslo (Norway)
Dr. Raquel Miño, University of Barcelona (Spain)
Dr. Pablo Rivera, Uni. Andrés Bello & Uni. of Barcelona (Chile & Spain)

01. Educational practices to transform and connect schools and communities 09-19
Prácticas educativas para transformar y conectar escuelas y comunidades
Ola Erstad, Raquel Miño & Pablo Rivera-Vargas (Norway, Spain & Chile)

02. The challenge of inclusive dialogic teaching in public secondary school 21-31
El reto de la enseñanza dialógica inclusiva en la escuela pública secundaria
Chrysi Rapanta, Mercè Garcia-Mila, Ana Remesal & Cláudia Gonçalves (Portugal & Spain)

03. STEAM projects with KIKS format for developing key competences 33-42
Proyectos STEAM con formato KIKS para el desarrollo de competencias clave
José-Manuel Diego-Mantecón, Teresa-F. Blanco, Zaira Ortiz-Laso & Zsolt Lavicza (Spain & Austria)

04. Aggressiveness, instability and social-emotional education in an inclusive environment 43-52
Agresividad, inestabilidad y educación socioemocional en un entorno inclusivo
Ana-M. Tur-Porcar, Anna Llorca-Mestre & Vicenta Mestre-Escrivá (Spain)

05. ICT and knowledge management in Teaching and Engineering Students 53-62
TIC y gestión del conocimiento en estudiantes de Magisterio e Ingeniería
E. Ferrero-de-Lucas, I. Cantón-Mayo, M. Menéndez-Fernández, A. Escapa-González & A. Bernardo-Sánchez (Spain)

KALEIDOSCOPE

06. News consumption and risk perception of Covid-19 in Spain 67-77
Seguimiento informativo y percepción del riesgo ante la Covid-19 en España
Alberto Mora-Rodríguez & Inmaculada Melero-López (Spain)

07. Presidential Twitter in the face of COVID-19: Between populism and pop politics 79-90
Twitter presidencial ante la COVID-19: Entre el populismo y la política pop
Juan-Luis Manfredi-Sánchez, Adriana Amado-Suárez & Silvio Waisbord (Spain, Argentina & USA)

08. Media representation of minors who migrate on their own: The MENA in the Spanish press 91-101
Representaciones mediáticas de los menores que migran solos: Los MENA en la prensa española
Juan-David Gómez-Quintero, Jesús-C. Aguerri & Chabier Gimeno-Monterde (Spain)

09. Meta-reflexivity for resilience against disinformation 103-112
Meta-reflexividad para la resiliencia contra la desinformación
Tea Golob, Matej Makarovič & Mateja Rek (Slovenia)

10. Predicting wellbeing in children's use of smart screen devices 113-122
Predicción del bienestar sobre el uso de pantallas inteligentes de los niños
Félix Ortega-Mohedano & Fernando Pinto-Hernández (Spain)

SUBMISSION GUIDELINES

GENERAL INFORMATION

'Comunicar', Media Education Research Journal is published by Grupo Comunicar Ediciones (VAT: G21116603). This established non-profit professional group, founded in 1988 in Spain, specialises in the field of media education. The journal has been in print continuously since 1994, published every three months.

Contents are peer reviewed, in accordance with publication standards established in the APA 7 (American Psychological Association) manual. Compliance with these requirements facilitates indexation in the main databases of international journals in this field, which increases the dissemination of published papers and therefore raises the profile of the authors and their centres.

'Comunicar' is indexed in the Social Sciences Citation Index (SSCI), Journal Citation Reports (JCR), Scisearch, Scopus and over 790 databases, catalogues, search engines and international repertoires worldwide.

Each issue of the journal comes in a print (ISSN:134-3478) and electronic format (www.comunicarjournal.com) (e-ISSN: 1988-3293), identifying each submission with a DOI (Digital Object Identifier System).

SCOPE AND POLICY

Subject Matter: Fundamentally, research papers related to communication and education, and especially the intersection between the two fields: media education, educational media and resources, educational technology, IT and electronic resources, audiovisual, technologies... Reports, studies and experiments relating to these subjects are also accepted.

Contributions: 'Comunicar' publishes research results, studies, state-of-the-art articles and bibliographic reviews especially in relation to Latin America and Europe and regarding the convergence between education and communication, preferably written in Spanish although submissions are also accepted in English. The contributions to this journal may be: Research papers, Reports, Studies and Proposals (5,000-6,700 words of text, references included), State-of-the-art articles: (6,000-7,200 words of text, including references).

Unsolicited manuscripts sent in by authors are initially placed in the Miscellaneous section of the journal. The Topics section is organized by an editor through a system of call for papers and specific commissions to experts in the field. If we receive manuscripts within the deadline for a particular topic, the journal editor can refer the manuscript to the Topics editor for assessment and possible publication in this monographic section. The deadline for each Topic section is at least nine months before publication.

EDITORIAL PROCESS

'Comunicar' confirms receipt of all articles submitted by authors and keeps the authors informed of the acceptance/rejection process, as well as the editing process, in the event of acceptance. The webpage www.comunicarjournal.com also provides information about manuscript editing procedures, full guidelines for publication, as well as the Annexes: review protocol prior to submission, manuscript structure protocol, external review protocol…

In general, once the external reports have been reviewed, the criteria that justify the editors' decision to accept or reject submissions are as follows: a) Topical and new; b) Relevance: applicability of the results to the resolution of specific problems; c) Originality: valuable information, repetition of known results; d) Significance: advancement of scientific knowledge; e) Reliability and scientific validity: verified methodological quality; f) Organisation (logical coherence and material presentation); g) Presentation: good writting style.

PRESENTATION AND STRUCTURE OF ORIGINAL PAPERS

Manuscripts must be sent exclusively through the Journal Management Centre (www.revistacomunicar.com/ojs/). These publication guidelines are based on the standards of the American Psychological Association (APA 7): (https://bit.ly/3cN4XX9).

Structure: The following two files must be sent together: manuscript (main text) and cover letter.

ETHICAL COMMITMENT AND RESPONSIBILITIES

Each author must submit a statement of authorship and text originality. Previously published material will not be accepted. The cover letter must specify the transfer of copyright ownership of the manuscript for its publication in 'Comunicar'.

www.comunicarjournal.com

Comunicar©

MEDIA EDUCATION RESEARCH JOURNAL

XXIX, 66

EDITORIAL BOARD

EDITOR IN CHIEF
- **Dr. Ignacio Aguaded.** University of Huelva, Spain

ASSISTANT EDITORS
- Dr. Amor Perez-Rodriguez, University of Huelva, Spain
- Dr. Angel Hernando-Gomez ,University of Huelva, Spain
- Dr. Rafael Repiso, UNIR / EC3, University of Granada, Spain
- Dr. Luis-Miguel Romero-Rodriguez, URJC, Spain
- Ms. Arantxa Vizcaino-Verdu, University of Huelva, Spain
- Dr. Agueda Delgado-Ponce, Reg. Government of Andalusia, Spain
- Dr. Patricia De-Casas-Moreno, University of Nebrija, Spain

THEMATIC EDITORS
- Dr. Ola Erstad, University of Oslo (Norway)
- Dr. Raquel Miño, University of Barcelona (Spain)
- Dr. Pablo Rivera, U. Andrés Bello / U. of Barcelona (Chile/Spain)

INTERNATIONAL COEDITORS
- **English:** Dr. M. Gant, Univ. Chester and Dr. C. Herrero (MMU), UK
- **Portuguese:** Dr. Vanessa Matos, Univ. Fed. Uberlândia, Brazil
- **Chinese:** Dr. Alice Lee (Hong Kong), Dr. Yuechuan Ke (USA) and Dr. Meng Shen (Spain)
- **Iberoamerican**: Dr. Octavio Islas, Ecuador
- **Russian**: Dr. Alexander Fedorov (Russia) and Dr. Margarita Bakieva (Spain)

ADVISORY BOARD

- Dr. Ismar de-Oliveira, University of São Paulo, Brazil
- Dr. Miguel de-Aguilera, University of Malaga, Spain
- Dr. J. Manuel Perez-Tornero, Autonomous University, Barcelona
- Dr. Guillermo Orozco, University of Guadalajara, Mexico
- Dr. Manuel Angel Vazquez-Medel, University of Seville, Spain
- Dr. Cecilia Von-Feilitzen, Nordicom, Sweden
- Dr. Joan Ferres, Pompeu Fabra Univer., Barcelona, Spain
- Dr. Agustin Garcia-Matilla, University of Valladolid, Spain
- Dr. Cristina Ponte, Nova University Lisbon, Portugal
- Dr. Pier Cesare Rivoltella, Catholic University of Milan, Italy
- Dr. Javier Marzal, Jaume I University, Castellon, Spain
- Dr. Jesus Arroyave, University of the North, Colombia
- Dr. Francisco Garcia-Garcia, Complutense Univer., Madrid, Spain
- Dr. Alberto Parola, MED, University of Turin, Italia
- Dr. Teresa Quiroz, University of Lima, Peru
- Dr. Concepcion Medrano, University of País Vasco, Spain
- Dr. Maria Luisa Sevillano, National Uni. of Distance Education, Spain
- Dr. Julio Cabero-Almenara, University of Seville, Spain
- Dr. Manuel Cebrian-de-la-Serna, University of Malaga, Spain
- Dr. Ana Garcia-Valcarcel, University of Salamanca, Spain
- Dr. M. Soledad Ramirez-Montoya, Monterrey Institute, Mexico
- Dr. Donaciano Bartolome, Complutense University, Madrid, Spain
- Dr. Samy Tayie, University of Cairo, Egypt
- Dr. Javier Tejedor-Tejedor, University of Salamanca, Spain
- Dr. Sara Pereira, University of Minho, Braga, Portugal
- Dr. Gloria Camarero, Carlos III University, Madrid, Spain
- Dr. Armanda Pinto, University of Coimbra, Portugal
- Dr. Pere Marques, Autonomous University of Barcelona, Spain
- Dr. Xose Soengas, University of Santiago, Spain
- Dr. Octavio Islas, Pontificial Catholic University, Ecuador
- Dr. Don Shin, Chung-Ang University, Seoul, Korea

ADVISORY BOARD

- Dr. Moises Esteban-Guitert, University of Gerona
- Dr. Patrick Verniers, Conseil Sup. Media Education, Belgium
- Dr. Domingo Gallego, National Uni. of Distance Education, Spain
- Dr. Manuel Area, La Laguna University, Tenerife, Spain
- Dr. Ramon Reig, University of Seville, Spain
- Dr. Gustavo Hernandez, ININCO, Central University, Venezuela
- Dr. Isabel Canton, University of Leon, Spain
- Dr. Juan de Pablos, University of Seville, Spain
- Dr. Gerardo Borroto, CUJAE, La Habana, Cuba
- Dr. Manuel Fandos-Igado, UNIR, Zaragoza, Spain
- Dr. Jorge Cortes-Montalvo, UACH/REDECA, Mexico
- Dr. Carmen Marta, University of Zaragoza, Spain
- Dr. Silvia Contin, National University of Patagonia, Argentina
- Dr. Begoña Gutierrez, University of Salamanca, Spain
- Dr. Ramón Perez-Perez, University of Oviedo, Spain
- Dr. Carlos Muñiz, Autonomous University of Nuevo Leon, Mexico
- Dr. Carmen Echazarreta, University of Gerona, Spain
- Dr. Evgeny Pashentsev, Lomonosov Moscow University, Russia
- Dr. Fahriye Altinay, Near East University, Turkey
- Dr. Jesus Valverde, University of Extremadura, Spain
- Dr. Yamile Sandoval, University of Santiago of Cali, Colombia
- Dr. Pilar Arnaiz, University of Murcia, Spain
- M. Paolo Celot, EAVI, Brussels, Belgium
- Dr. Victoria Tur Viñes, University of Alicante, Spain
- Dr. Jose-Maria Morillas, University of Huelva, Spain
- M. Jordi Torrent, ONU, Alliance of Civilizations, NY, USA
- Ms. Kathleen Tyner, University of Texas, Austin, USA
- Ms. Marieli Rowe, National Telemedia Council, Madison, USA

INTERNATIONAL REVIEWERS BOARD

- 735 Reviewers of 48 countries (2021-1)
  www.revistacomunicar.com/index.php?contenido=revisores&idioma=en

BOARD OF MANAGEMENT

- D. Francisco Casado-Mestre, University of Huelva, Spain
- Ms. Daniela Jaramillo-Dent, University of Huelva, Spain
- Ms. Mónica Bonilla-Del-Río, University of Huelva, Spain
- Ms. Bárbara Castillo-Abdul, University of Huelva, Spain
- Dr. Isidro Marín-Gutiérrez, UTPL, Ecuador
- Dr. M. Carmen Caldeiro, University of Santiago, Spain
- Dr. Paloma Contreras-Pulido, UNIR, Spain
- Dr. Mar Rodríguez-Rosell, UCAM, Murcia, Spain

- ICT CONSULTANT: Alex Ruiz, Spain
- COMMERCIAL MANAGER: Belén Pérez, Spain

© ISSN: 1134-3478 • e-ISSN: 1988-3293

Comunicar©

Quality Criteria

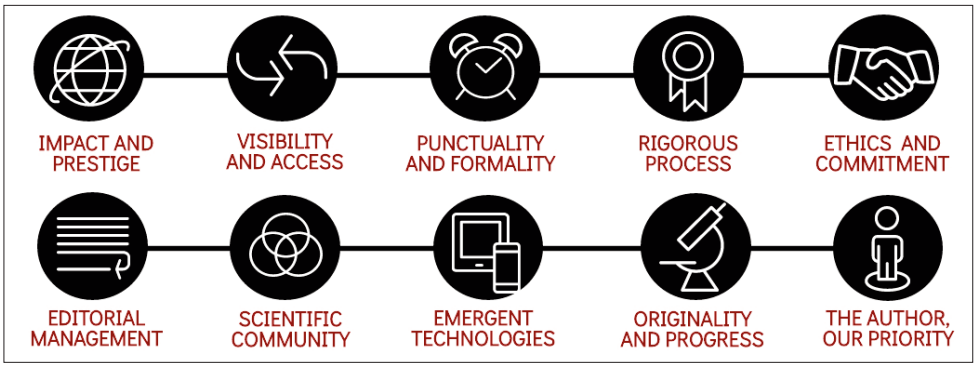
Registered in the Spanish Patent and Trademark Office, with the code1806709

GLOBAL MIL AWARDS
UNESCO, 2019

MARIANO CEBRIÁN TOP PRIZE
University of Zaragoza/Aragon-Radio, 2015

TOP PRIZE IN COMMUNICATION
Carlos III University, Madrid, 2007

QUALITY CRITERIA



Quality criteria of 'Comunicar' Media Education Research Journal are the indicators of our commitment to a rigorous and professional publishing process. They constitute the endorsement for authors, reviewers, collaborators and readers that the final product offered meets the highest standards and academic rigour expected from a publication of national and international reputation.

• **Impact and prestige** are guaranteed by being in the first quartile among the most recognised journals: Q1 in Journal Citation Reports (JCR) in Communication and Education; Q1 in Scopus (SJR) in Cultural Studies and Q1 in Scopus (CiteScore) in Communication and Education.

• **Visibility and access** are safeguarded by an open and shared access policy that makes all published manuscripts available to any reader in a bilingual version: Spanish and English.

• **Punctuality and formality** contribute to an efficient flow of manuscripts within established timeframes, facilitating quarterly publication thanks to highly effective schedule compliance.

• **A rigorous process** is supported by an International Reviewers Board of nearly 733 highly qualified researchers in the fields of education and communication from almost 48 countries all over the world.

• **Ethics and commitment** that ensure the upholding of rights and duties that protect the whole academic community: authors, reviewers, readers and editors. Our Code of Ethics is based on the International Committee on Publication Ethics (COPE), ensuring guidance for authors.

• **High quality Editorial Management** is accomplished throughout the OJS Platform, from the Science and Technology Foundation (FECYT), complemented by reviewers´ contributions and stylistic department work in English and Spanish languages.

• Our **scientific community** is fostered and increased by an influential academic community of authors (1,875), reviewers (735) and readers all over the world. This Community is supported by a committed editorial group composed of: an Editorial Board, an Academic Committee, an International Reviewers Board, an Advisory Board and a Technical Board.

• Use and development of **emergent technologies** encourages the diffusion and impact of the journal, continuously adjusting the access formats, communication models and academic platforms for academic diffusion (ResearchGate, AcademiaEdu...).

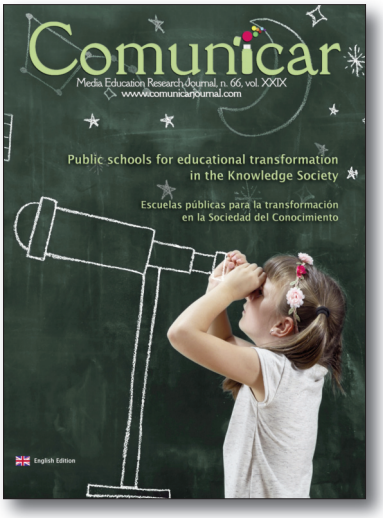
• The **originality and progress** of the outstanding research contributions from the research areas of communication and education are guaranteed by plagiarism controls (CrossCheck), applied to all manuscripts accepted before being published to preserve the originality and progress of research.

• At last but not least the **author is our priority**, since after all, authors uphold and give sense to entire process. Every manuscript is available in the Journal website with accurate information about citation, statistical data, references, impact metrics and interaction in social media.

Quality criteria are, in summary, a set of standards that guarantee the whole process, ensuring a professional treatment for every person involved in the publishing, reviewing, editing and spreading processes of the manuscripts.

Information on evaluators, acceptance/rejection rates and internationalisation in Comunicar 66

• Number of research works received: 243. Number of research works accepted: 10.
• Percent of manuscripts accepted: 4.12%; Percent of manuscript rejected: 12.76%.
• Received manuscripts internationalisation: 17 countries.
• Numbers of Reviews: 392 (144 internationals and 248 nationals) (update: www.comunicarjournal.com).
• Scientific Reviewers internationalisation: 32 countries.
• Country of origin: 8 countries (Chile, Spain, Norway, Portugal, Austria, Argentina, USA and Slovenia).
• International databases in COMUNICAR 66: 797 (2021-01) (update: www.comunicarjournal.com).



Comunicar 66

Special issue

Public schools for educational transformation in the Knowledge Society

Comunicar

Web of Science Group | A Clarivate Analytics company

Journal Citation Reports

22º / 263 Education

13º / 92 Communication

Scopus®

2ª / 1.002 Cultural Studies

19º / 387 Communication

43º / 1.254 Education

© ISSN: 1134-3478 • e-ISSN: 1988-3293

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Educational practices to transform and connect schools and communities

Prácticas educativas para transformar y conectar escuelas y comunidades

Dr. Ola Erstad. Full Professor, Department of Education, University of Oslo (Norway) (ola.erstad@iped.uio.no) (https://orcid.org/0000-0003-1712-300X)
Dr. Raquel Miño. Lecturer, Department of Didactics and Educational Organization, University of Barcelona (Spain) (rmino@ub.edu) (https://orcid.org/0000-0002-5391-4637)
Dr. Pablo Rivera-Vargas. Lecturer, Department of Didactics and Educational Organization, University of Barcelona (Spain), and Professor, Faculty of Education and Social Sciences, University Andrés Bello (Chile) (pablorivera@ub.edu) (https://orcid.org/0000-0002-9564-2596)

ABSTRACT

The current social and educational challenges force us to rethink the role of educational institutions and digital technologies in the 21st century, which requires a deeper understanding of learning activities in schools. In this article we analyze bottom-up initiatives for educational transformation implemented in public lower secondary schools from Norway, Chile and Spain that involved 230 students and 14 teachers. Three ethnographic case studies were carried out, using individual interviews, focus groups, participant observations and document analysis in six schools. The main goal was to deeply understand how bottom-up school initiatives, with a comprehensive use of digital technologies, are contributing to generate connected practices and to involve teachers, learners and communities in the discussion about what kind of society they want in their future. The results of the analysis indicate that fostering a transformative agency in secondary schools has the potential of engaging students in the exploration of contemporary social issues and that digital connectedness can contribute to connect schools with youth life trajectories and communities. This study on transformative agency and digital connectedness reveals a new path for educational transformation that may interest everybody who, in one way or another, are involved in education systems all around the world.

RESUMEN

Los desafíos sociales y educativos que enfrentamos en la actualidad nos obligan a repensar cuál es el rol de las instituciones educativas y de las tecnologías digitales en el siglo XXI, lo cual requiere una comprensión más profunda de las actividades de aprendizaje de las escuelas. En este artículo analizamos iniciativas para la transformación educativa implementadas en centros de secundaria públicos de Noruega, Chile y España que involucraron a 230 estudiantes y 14 profesores. Se llevaron a cabo tres estudios de caso etnográficos a partir de entrevistas, grupos de discusión, observaciones participantes y análisis documental en seis centros. El objetivo principal fue comprender en profundidad cómo estas iniciativas contribuyen a generar prácticas conectadas y a involucrar al profesorado, el estudiantado y las comunidades en la discusión sobre el tipo de sociedad en la que quieren vivir en un futuro. Los resultados del análisis indican que el fomento de una agencia transformadora en los centros de secundaria tiene el potencial de involucrar al alumnado en el estudio de problemáticas sociales contemporáneas y que la conectividad digital puede contribuir a conectar las escuelas con las trayectorias de vida y las comunidades de los jóvenes. Este primer estudio sobre agencia transformadora y conectividad digital desvela una línea de transformación educativa que puede interesar a todos aquellos individuos que, de una forma u otra, están involucrados en los sistemas educativos de todo el mundo.

KEYWORDS | PALABRAS CLAVE

Transformation, agency, school, community, digital technologies, learning.
Transformación, agencia, escuela, comunidad, tecnologías digitales, aprendizaje.

Received: 2020-05-30 | Reviewed: 2020-06-05 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-01 | Pages: 9-19

1. Introduction

During the first two decades of the 21st century questions of educational provision and the role of schools in our societies have emerged as key issues of concern to deal with future educational challenges. Schools are defined as important institutions in our societies providing knowledge building among the younger generation and as mechanisms to develop engaged citizens for full participation in societies. However, educational researchers have increasingly raised critical questions about educational futures and how we understand the school of the future (Biesta, 2006; Claxton, 2008; Eynon, 2018; Giroux, 2020). Where are we going and how do we get there?

Technological developments have been explained as a lever for change in schools from a top-down perspective by some researchers and policy makers (Selwyn, 2016; Sancho-Gil et al., 2019). However, research shows that changing educational practices just by using technology in itself is difficult and naïve. Our approach towards educational futures for teachers and students is about ways of opening up schools as connected practices engaging students and teachers as learners in new ways. Technological resources and tools play a crucial role in developing ways of creating connectedness for learners (Ito et al., 2013).

Two key points highlighted in this article relate to bottom-up strategies and transformative agency. The empirical data presented is from three different projects in three different countries. There are both similarities and differences across these cases, but one basic similarity is the use of bottom-up strategies for creating new understandings of what learning activities are about, for whom, and in what ways. Something is always at stake when young people learn, for themselves and others, as ways of engaging in creating knowledge of importance for themselves and their communities (Buckingham, 2006). Our research questions are then: a) what are the main characteristics of bottom-up processes for creating engagement and knowledge construction among students? b) how is transformative agency defined as part of educational projects that connect schools and communities? and c) how is digital connectedness embedded?

1.1. Transformative agency and digital connectedness

The concept of "transformative agency" has been used within diverse fields of research for several decades. Within education it has been used on diverse levels of analysis – from individual to systemic and collective forms of change. As we argue in this article, we need to conceptually and empirically understand transformative processes beyond the school or educational institution itself, and how such institutions perceive students, teachers, parents and other stakeholders as ways of crossing boundaries of what education and learning in contemporary societies need to address.

The agency of learners, what some describe as «agentive selves» (Hull & Katz, 2006), refers to the «ownership» students experience of their own learning process, their involvement and identity formation as learners. In this sense, agency refers to the capacity to initiate goal-oriented action that implies autonomy, choice and engagement (Biesta & Tedder, 2007; Holland et al., 1998). Instead of understanding this as an individual ability to act on their environment in certain ways, some argue for using the term "relational agency" (Edwards & Mackenzie, 2006). They emphasize how students connect to relevant others as part of learning trajectories and across different settings. The success of a certain activity depends on the contribution from all in a group, thus creating relational agency (Bender & Peppler, 2019).

The term "transformative agency" has been highlighted within cultural-historical activity theory (CHAT). By using "developmental work research" and "change laboratory" methodologies Engeström (2016) and others have focused on mechanisms of transformation within systems and ways of engaging people within diverse settings. In line with Virkkunen (2006) we see the traditional way of approaching transformations within organizations as highly problematic not involving grass-roots level practitioners in authentic ways. Therefore, our approach is more oriented to grasp the complex practices that diverse stakeholders are involved in. In line with our argumentation in this article we will refer to Stetsenko (2019: 2), who takes a more radical perspective on transformative agency situated within contemporary social tensions and challenges. She writes about "radical-transformative agency" and argues against the dominant contemporary approaches of relational agency, moving toward explicitly political and activist accounts of agency. Her argument is that there is a residue of passivity in all the main conceptions of

development and agency and that to overcome it, we need to reconstruct the basic premises on human development. "It is critical to consider how we are not merely 'in' the world but are ourselves *the* world because we are directly implicated in its dynamics as its co-creators".

Another scholar with an activist approach to educational transformation is Lipman (2011: 167), who argues that if we want to imagine new ways of living together, as a new social imaginary, we need to create spaces in schools where students "learn to integrate their social realities and examine the root causes of the many crises facing their communities, explore solutions, build solidarities, and develop global perspectives". Also, with the advent of mobile and social media, learning has taken on a distributed, location-based and self-directed character. Digital media reflect trends towards seeing learning as dynamic across space and time (Erstad et al., 2013) offering "new mobilities" – a new digital connectedness (Chayko, 2014). In such contexts, communities of cultural and technological diversity represent different opportunities and barriers for participation (Sancho-Gil et al., 2019) as part of the dynamic process of co-constructing identity, interests and knowledge. How they give body and voice to their views can be seen as much in action as reflection (Stornaiuolo et al., 2017; Rajala et al., 2012).

«Authentic learning» has been mentioned as a key aspect of creating motivating learning situations for students (Herrington et al., 2014). Different learning settings in- and out-of-school have their opportunities and constraints when it comes to authentic learning; consequently, they provide different opportunities for agency (Thomas & Brown, 2011). Most studies that address authentic learning emphasize four criteria (Rule, 2006): students 1) investigate a real-life 2) open-ended problem, 3) motivated to «devise solutions that change people's action, beliefs, or attitudes» 4) as inquirers with the teacher as a mentor (Rule, 2006, p.2). Based on these conceptual explorations we now turn to the methodological section.

2. Material and methods

This article draws on data from three case studies carried out in public secondary schools from Oslo (Norway), Santiago de Chile (Chile) and Barcelona (Spain) in the framework of three different national projects. A common objective across the three case studies was to analyze bottom-up initiatives from schools to create meaningful situations that promote «authentic learning» among students and teachers, connect with their communities and address social issues and inequalities (Herrington et al., 2014). The initiatives involved a total of 9 schools, 14 teachers, and 230 students. For this article, we have selected one project per country, meaning that the sample was made up by 6 schools, 6 teachers and 81 students. The criteria to select the cases were the relevance and suitability to analyze bottom-up processes to foster transformative agency, considering the results of the national projects and the perspective of local experts in educational transformation.

Ethnography as logic of inquiry was used as an approach (Green et al., 2005; Yin, 2014), and similar research methods and strategies were used (Table 1). In total, 32 active interviews (Holstein & Gubrium, 2016) and 16 focus groups (Barbour, 2013) were collected with school management teams, teachers and students. In order to validate the instruments, the guidelines for the interviews were reviewed by peers who were experts in the field. The authors conducted participant observations (Shah, 2017) at each school and analyzed school documents that were relevant for the cases. Every interview was recorded and transcribed, and notes were taken during the participant observation. In order to maintain confidentiality, the names of schools and participants used in the article are fictitious.

Table 1. Data collection

Country	School	Data collected		
		Interviews	Focus Groups	Fieldnotes and photos from observations
Norway	West	6	4	✓
	East	6	4	✓
Chile	North	4	2	✓
	South	4	2	✓
Spain	Urban	6	2	✓
	Rural	6	2	✓

In terms of analysis, the total corpus of transcripts and field notes were coded according to the thematic areas addressed in the guideline and the emerging dimensions to create units of meaning that responded to the research objectives. The analysis was conducted by systematically reading the codes, patterns and themes, searching for contrasts, paradoxes and irregularities (Denzin, 2003). Afterwards, the codes were grouped and regrouped until they made sense and the narrative structure of each case study was created.

In the following section, the findings from each case study are presented by the following structure: 1) Planning for bottom-up strategies; 2) Transformative practices; 3) Embedded digital technologies; 4) Negotiating outcomes.

3. Results

In this section we present the main results of the case studies carried out in Norway, Chile and Spain. The selection of three countries with considerably different social, education and economic systems allow us to consider how these characteristics may influence the schools' initiatives for educational transformation. Therefore, we begin by shortly identifying some of the main similarities and differences between countries. The economic development model, the educational policy and the social fabric itself are dimensions that modulate educational contexts and practices (Ávalos & Bellei, 2019), which is especially evident in these three countries. In terms of public education, in Norway there are hardly any private schools, while in Chile only 37% of elementary, lower secondary, and upper secondary students attend public schools. In Spain and Chile charter schools play an important role, while not in Norway. Another relevant difference between the three education systems is the degree of autonomy provided by the education system and the curriculum to school leaders and teachers. The curriculum gives a high degree of autonomy for teachers to define their own practices in Norway (Imsen & Volckmar, 2013) and high degree of autonomy, but also of accountability in Spain (Bolívar-Botía & Bolívar-Ruano, 2011), while in Chile schools do not have legal autonomy to carry out their own administrative management and design their educational projects (Ávalos & Bellei, 2019). Pointing at the differences between the three systems is essential to frame the possibilities and challenges encountered by schools that try to promote educational transformation in each country. For this reason, the results are separated by country, and then, a crossed-country analysis is presented in the discussion.

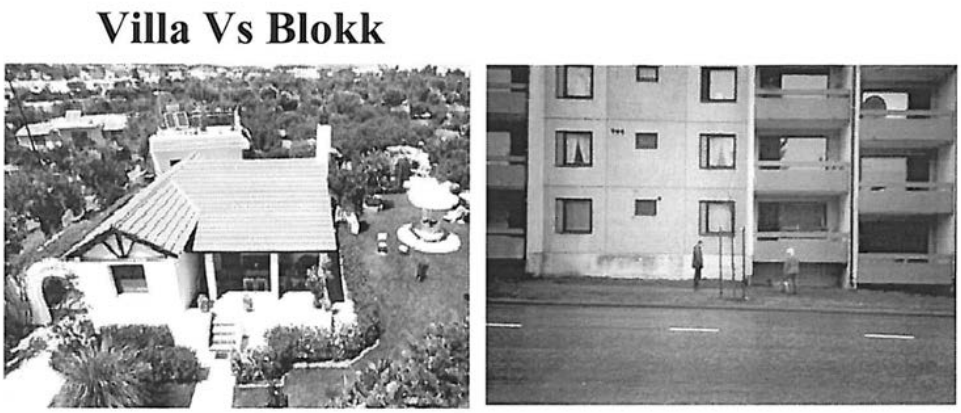
3.1. Case 1: Oslo

The project from Norway involved two lower secondary schools, one in the Eastern part of Oslo and the other in the Western suburbs. Both schools had long experiences of project work as the main school activity all year round (Rasmussen, 2005). At each school, a group of students took part in the project during a two-week period at the beginning of the school year (20 students in one school and 40 students in the other). The school in the Western suburbs had students from families with a high socio-economic background. At the school in the Eastern inner-city part of Oslo the students came from many different cultural backgrounds with about 65% of the students from minority language-speaking families.

The teachers at the school in the Western suburbs initiated the project idea. They brought some headlines from national and local newspapers reporting on results from a research study showing huge differences in the life expectancy age between people living in the East and West of Oslo. This shocked the students and was an important stimulus for their motivation for developing a larger project involving a school from a totally different socio-economic community in the same city. The teachers took contact with a school in the Eastern inner-city part of Oslo and asked if they were interested in collaborating on a project about prejudice of the Other and differences in living conditions. Collectively they decided to make a website as a newspaper for each school based on information they collected by searching online, going into their community to interview people and stakeholders in the municipality, and organizing a trip to visit the other school with a group of students from each school.

The students collected a lot of information from public sources about living conditions in different communities. They also made visual representations to support their ideas about difference, like putting together two photos (Figure 1) taken from each of the communities on how people live.

Figure 1. Illustration from the online newspaper in the West, showing a villa in the West versus an apartment building in the East. Found online



The elements that really engaged the students in a transformative way were both interviews they did with some stakeholders in the community and the visit to the other school. In this way they engaged on a personal level. None of the students had ever crossed the line in the center of Oslo dividing East from West. Each group documented their travel across town with a video camera. They interviewed students, took photos and wrote about their personal impressions. In their descriptions they described similarities and differences about how people dressed and talked, about the community and the schools.

The students used different digital tools to collaborate and create an online newspaper. They used a collaborative online platform called Classfronter, and they created questions they sent to each other using this platform and social media. They looked up online information using their laptops or smartphones. The visits were documented by using their phones to make a video film and photos to use in their production. For the online newspapers they used different software tools and visual effects.

One interesting event happened when a group of students from the school in the West, all girls, had travelled across town to meet and interview students at the school in the East. Some boys at the school in the east lied to the girls from the West about access to drugs at the school and violence in the neighborhood and the girls accepted what they were told as true. Teachers took this event as an issue for discussion in both student groups as an interesting example of prejudices they held about each other.

In several respects the activities the students were involved in were experienced as authentic learning. The framing of the project was based on facts about living conditions and life expectancy age. They found other information, visited people in their own community, and visited students that represented the Other. They gained more insight about prejudices, but tensions about differences were still there when the project ended. The students from the school in the East expressed this in the interviews at the end of the project:

Student 1: "I believe that, one cannot do anything about prejudice really. They are there anyway. It does not help. Everybody knows that not everyone is like that. At the same time, there is a reason why we have them. I do not think you can stop or anything. They probably think different, but people here also think different. I do not think the same as him" (Boy, school East)

"Why is martial arts so popular at (the school in the East)? Maybe it is just a necessity for them since there are many gangs there, and to be able to fight, and maybe you get respect".

"50cent, 2pac and Snoop Dog. These are just a few of the artists that are much hotter in the East than in the West. Maybe it has to do that they feel they live in the 'slum' of Oslo? Do they feel that the tuff rap-environment fits their everyday life?" (Extracts from online newspaper school West after visit).

The students were engaged in the project on a personal level, drawing on experiences from outside the school, yet reworking these experiences within a school context. In negotiating meaning making about differences and similarities between the two communities in Oslo, they started reflecting on their own lives, about how they appeared to others, and how the material conditions of their lives determined life-

opportunities. The use of personal stories set against collected material facilitated this process of «placing» the self within larger narratives, thereby enabling all involved to contrast schooled learning with other community-based kinds of learning and personal development.

3.2. Case 2: Santiago de Chile

The case from Chile was implemented in the framework of an initiative carried out in two public secondary schools that are situated in one of the poorest and most marginal areas of Santiago city. A group of students from each school took part in this initiative for five months (from May to October), with 35 students from one school and 37 students from the other. The activity involved the creation of 7 working groups comprised of 10-12 students from both schools. Each group was formed with a similar number of foreign and local students. The promoters were two History teachers from these schools, who raised the need to improve the relationships between local and foreign students because in previous years there had been problems of coexistence between them. They decided to implement projects so the students could inquire into the main problems of their neighborhoods and propose ways to address them, by playing a mentoring role throughout the process.

Figure 2. Students working in one of the schools and in a nearby park. Photographs were taken by the participants

Concerning the transformative practices, this project focused on poverty and social inclusion of the neighborhoods where the two involved schools were located. In the initial sessions of the project, the students discussed which differentiating and common aspects existed within the students that composed the group. The first topic proposed by the students was racism and xenophobia at school. Foreign students (mostly Haitians) expressed their discomfort with receiving offensive and xenophobic comments during

their stay at school. As a teacher expressed: «Foreign students made us see that they were going to participate in a project with the same classmates who offended them or did not speak to them throughout the year» (Chilean teacher, school North). In the dialogue between local and foreign students, they debated if these comments were justified and if they were a reproduction of broader social prejudices. This discussion posed a challenge: intercultural coexistence between students had to be resolved before starting the project with their communities.

The second topic addressed was poverty and social inclusion among the population living in the surrounding areas of the schools. This theme was relevant because it was a common phenomenon that connected them beyond their country of origin. Students began to debate and identify issues and characteristics that could help them understand the reasons behind poverty in this district and their social problems (Figure 2). Regarding the embedded digital technologies, a significant number of students from both schools lack a technological device for their personal use. Usually those who have access to technological devices are able to access the internet only with Wi-Fi connection. Despite this reality, digital technologies played an important role in the development of the project, as they allowed students to organize among themselves and coordinate meetings and interviews with the community. "Mobile devices were used by students mainly to visually and digitally record a large part of the practices and actions carried out in the project" (Chilean teacher, school A).

The students produced a digital report with images and videos of a large part of their experiences. This document developed two main dimensions: a historical perspective of the neighborhood and its main current problems and proposals to improve the quality of life in the neighborhood. Students and teachers actively participated in the negotiation and management of the project from the beginning. The main needs and priorities to be developed were decided collectively. For example, definitions of xenophobia and racism were firstly exposed, generating a debate that led to a common definition of both terms. They also concluded that prejudices had no connection with reality, valuing the contributions made by the migrant population to the economic and cultural development of Chile. The development of the project provided students with opportunities to improve their relationships and allowed them to see beyond their differences of origin or the neighborhood where they lived. They concluded that they shared a set of common social challenges and problems related with their personal development and the situation of their communities. Teachers and representatives of both schools were satisfied with the development of the project and the way in which this group of students led their own learning process, connecting their personal lives and worries to think about the improvement of their quality of life and of the population as a whole. However, teachers expressed doubts about the sustainability of the links generated by the students outside the project.

"Prejudices about the migrant population are generated and reinforced in the students' families and friends. Furthermore, the foreign population tends to relate to itself. So, if there is no general inclusive attitude in society, all these initiatives will probably come to nothing" (Chilean teacher, school B).

In spite of this difficulty, the management team planned to continue with the initiative in the next years, expanding it to other courses and educational levels.

3.3. Case 3: Barcelona

The case from Spain was part of an initiative from five secondary schools and the University of Barcelona to engage 10 teachers and 97 students from five secondary schools to design and implement projects that connected with students' lives and worries. The specific project presented in this article was carried out for eight months (from October to May) and involved two teachers and nine students from two lower secondary schools, one located in the city and the one in a semi-rural area of Barcelona. Both schools had experience in promoting project-based learning and they wanted to challenge their educational practices to connect the school curriculum with students' lives. The project started when five students from the urban school proposed as a topic of interest «preventing gender violence». They created a digital poster to find students from other schools of the network with the same interest, with the message:

"Gender violence is a scourge in our society that unfortunately is very present and is not always seen. If you want to be part of the group, make visible the reality of gender violence and propose measures to prevent these behavior patterns, we count on you" (Students, Urban school).

Four students and one teacher from the semi-rural school got involved in this project and they met in a face-to-face meeting at the University of Barcelona, where they agreed to publish together an online magazine to prevent gender violence.

In terms of transformative practices, students had an opportunity to decide what they wanted to study, and the processes through which they could discuss a contemporary social issue such as gender violence. Since the students were already interested in gender issues and they already participated in activist actions out of school, their objective was to create awareness about gender violence and create measures to prevent it.

They met face-to-face in the urban school on the International Women's Day to participate in the activities organized by this school. There they started the magazine and made interviews to students, teachers and experts in gender from an organization called Active Network of Youth for Equality, that was collaborating with both schools. They also made an audiovisual report of the activities organized during Women's Day. This project encouraged the learners' agency through practices oriented to fulfilling a common goal that required a big amount of autonomy, engagement and involvement with the community, connecting with their previous experiences and knowledge on gender violence. For example, they created a feminist dictionary with concepts that some of them already knew, such as "social construct", "masculine privilege" or "gender roles", analyzed discriminatory scenes from Disney movies and organized a photo contest among students to represent gender violence from their perspectives as young people (Figure 3).

Figure 3. Winner photographs of the contest. Drawings have been created to ensure anonymity

Note. Image 1) "I was not born a woman to die for being one"; Image 2) "I can't anymore".

Students were at the center of the educational process, but the mentoring role of teachers was fundamental. At the same time, they found tensions because some students were more engaged than others. The teachers did not know how to get their involvement without using the logic of getting good marks, because these kinds of projects require motivation, not to get a good mark but to engage with the group, learn from others, explore real-life problems and propose solutions based on a shared process of inquiry.

Digital technologies were central in every stage of the project, allowing students and teachers from schools located in different regions to communicate, conduct interviews, organize a photo contest and publish a magazine together. Nevertheless, digital technologies were embedded in these transformative practices because in both schools they already used them to connect with other institutions and contribute to activism by creating digital products such as videos or digital magazines. Therefore, creative and transformative uses of digital technologies were already embedded in the educational culture of the schools.

The most powerful outcome of the project was that it favored learning practices that connected with social issues. This was expressed in an interview with the teacher when he talked about the importance of addressing gender violence and inequality transversally in schools and not only one day a year or through one single project. He referred to a student who had reported a case of symbolic violence, after being

involved in many school activities where she had learned to identify it. "If the student had not received the message from her school and family that she had to report this, she would have never done it" (Teacher, urban school). In this interview, the teacher pointed out one of the cores of transformative agency: social issues such as gender violence go much beyond school, but addressing them is of major importance if we want to build a more equal society. A similar reflection was done by one student in an interview at the end of the project:

"I think that doing these kinds of projects is important because people have not integrated what gender violence is. They don't know what feminism is. Doing these projects allow you to collaborate with this issue, to move from one perspective to another, to understand why women are fighting for this. I have seen very narrow-minded people in our high school, but also guys who have moved and became feminist. I think that this is a good contribution to make people open their eyes, because you are transforming a little bit what the result will be when we get older" (Student, urban school).

Teachers and students' voices point at the potential of these educational practices to generate awareness and empowerment, and to think about the kind of society they want in their future.

4. Discussion and conclusion

Analyzing educational projects that encourage transformation of public secondary schools in different countries is really relevant, in a historical moment when we are discussing what educational systems in contemporary and global societies need to address.

Going back to our initial research questions, the presentation above has shown that bottom-up processes for creating engagement and building knowledge with students are very much dependent on how participants define the initiation and origin of the projects, their thematic focus and activities. The starting point in the three cases was the intention of some teachers to encourage students to connect the school curriculum with their lives and with contemporary social issues. All of these initiatives promoted teachers and students to make decisions collectively, activating learning processes that opened spaces for creating new frames of interpretation and meaning-making (Lipman, 2011; Mezirow, 2012).

In terms of transformative agency, the main element that engaged students, teachers and communities in a transformative way was that the projects started from shared concerns about social issues that affected them (Stetsenko, 2019). They collectively studied what was behind these issues, by writing their own stories, interviewing members of their communities and stakeholders, and visiting schools and districts where they had never been before. The potential of these processes of inquiry is that they provide opportunities for authentic learning, studying real world situations and exploring questions such as: how are we reproducing social prejudices? How is gender discrimination reproduced through media? Or, what causes poverty and xenophobia? The projects represent different community orientation of educational learning processes involving stakeholders to understand these situations better (Rule, 2006).

Another characteristic of the projects was that they generated connections between young people's life trajectories and broad social issues. The students reflected about how they can be active actors in consolidating the society they are part of, reproducing or standing against stereotypes, discrimination or violence. However, generating this transformative relational agency (Edwards & Mackenzie, 2006) required a lot of involvement and contribution from the actors involved. Due to this requirement, it is complex to think about the possibility of expanding this type of initiative to the whole school or to an entire education system. Also, as shown in the three cases presented, and in other studies about transformative agency in countries such as Zambia (Bajaj, 2009) or Finland (Kajamaa & Kumpulainen, 2019), projects like these create tensions in different levels and between different actors that teachers and students need to face. This is a complexity, but at the same time it expands learning practices that are usually present in schools.

Regarding the third research question, digital technologies played a crucial role in terms of connectedness. The students used technologies to communicate and collaborate with other students and stakeholders, share questions, look up information, document their processes of inquiry, conduct interviews and edit a newspaper and a magazine. Mobile phones facilitated some of these processes, although the lack of digital devices and connectivity in the case of Chile also limited their possibilities. The way digital

connectedness was embedded in the projects was related with the way it was integrated in each school culture. So, when teachers and students are used to integrating digital technologies in their projects to contact with other institutions, creating digital content and sharing it online, it can be easier for them to think about possibilities to go beyond the classroom context (Kajamma & Kumpulainen, 2019).

In the case of Oslo, it was especially interesting that publishing their results online involved a discussion related to the digital age, ethics and awareness of what can be the consequences of divulging a piece of information. In the cases of Santiago de Chile and Barcelona, producing digital content and sharing it online had an activist and transformative potential for their communities (Miño-Puigcercós et al., 2019).

At the same time, a shared limitation was that social inequalities, gender violence and xenophobia are structural phenomenon that go much beyond schools. Therefore, creating spaces for transformation in schools cannot be an isolated task. If a more inclusive attitude is not present in a society as a whole, these initiatives can be just isolated events. At the same time, these projects could be significant spaces where students have the opportunity to think about the kind of society they create for their own future.

Funding Agency

This research received international support from the Norwegian Research Council, the Department of Education from the University of Oslo, The Institute of Research in Education and the Department of Didactics and Educational Organization from the University of Barcelona, the «Education for All» Program from the Ministry of Education of Chile, and the University Andrés Bello.

References

Bajaj, M. (2009). 'I have big things planned for my future': The limits and possibilities of transformative agency in Zambian schools. *Compare*, *39*(4), 551-568. https://doi.org/10.1080/03057920701844503

Barbour, R.S. (2013). *Los grupos de discusión en Investigación Cualitativa*. Morata.

Bender, S., & Peppler, K. (2019). Connected learning ecologies as an emerging opportunity through Cosplay. [Los entornos de aprendizaje conectado como oportunidad emergente mediante el Cosplay]. *Comunicar*, *58*, 31-40. https://doi.org/10.3916/C58-2019-03

Biesta, G., & Tedder, M. (2007). Agency and learning in the lifecourse: Towards an ecological perspective. *Studies in the Education of Adults*, *39*, 132-149. https://doi.org/10.1080/02660830.2007.11661545

Biesta, G.J. (2006). *Beyond learning: Democratic education for a human future*. Routledge. https://doi.org/10.4324/9781315635811

Bolívar-Botía, A., & Bolívar-Ruano, R. (2011). Schools principals in Spain: from manager to leader. *International Journal of Education*, *3*(1), 5-5. https://doi.org/10.5296/ije.v3i1.463

Buckingham, D. (2006). Defining digital literacy: What do young people need to know about digital media. *Nordic Journal of Digital Literacy*, *10*, 21-35. https://bit.ly/2XdnqXq

Chayko, M. (2014). Techno-social life: The Internet, digital technology, and social connectedness. *Sociology Compass*, *8*(7), 976-991. https://doi.org/10.1111/soc4.12190

Claxton, G. (2008). *What's the point of school? Rediscovering the heart of education*. OneWorld.

Denzin, N.K. (2003). *Performance ethnography. Critical pedagogy and the politics of culture*. Sage. https://doi.org/10.4135/9781412985390

Edwards, A., & Mackenzie, L. (2005). Steps towards participation: The social support of learning trajectories. *International Journal of Lifelong Education*, *24*(4), 287-302. https://doi.org/10.1080/02601370500169178

Engeström, Y. (2016). *Studies in expansive learning: Learning what is not yet there*. Cambridge University Press. https://doi.org/10.1017/cbo9781316225363

Erstad, O., Gilje, Ø., & Arnseth, H.C. (2013). Learning lives connected: Digital youth across school and community space. [Vidas de aprendizaje conectadas: Jóvenes digitales en espacios escolares y comunitarios]. *Comunicar*, *20*(40), 89-98. https://doi.org/10.3916/c40-2013-02-09

Eynon, R. (2018). Into the mainstream: Where next for Critical Ed Tech research? *Learning, Media and Technology*, *43*(3), 217-218. https://doi.org/10.1080/17439884.2018.1506976

Giroux, H.A. (2020). *On critical pedagogy*. Bloomsbury. https://doi.org/10.5040/9781350145016

Green, J.L., Dixon, C.N., & Zaharlick, A. (2005). Ethnography as a logic of inquiry. In J. Flood, D. Lapp, J. Squire, & J. Jensen (Eds.), *Methods of research on teaching the English language arts* (pp. 155-204). Routledge. https://bit.ly/2ZEw826

Herrington, J., Reeves, T.C., & Oliver, R. (2014). Authentic learning environments. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 401-412). Springer. https://doi.org/10.1007/978-1-4614-3185-5

Holland, D., Lachicotte, W., Skinner, D., & Cain, C. (1998). *Identity and agency in cultural worlds*. Harvard University Press. https://bit.ly/2WxcKlQ

Holstein, J.A., & Gubrium, J.F. (2016). *Narrative practice and the active interview*. Sage.

Hull, G.A., & Katz, M.L. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English*, *41*, 43-81. https://bit.ly/2B8vP5W

Imsen, G., & Volckmar, N. (2013). The Norwegian school for all: Historical Emergence and Neoliberal Confrontation. In U. Blossing, G. Imsen, & L. Moos (Eds.), *The Nordic Education Model. 'A School for All' Encounters Neo-Liberal Policy* (pp. 35-55). Springer. https://doi.org/10.1007/978-94-007-7125-3_3
Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Shor, J., Sefton-Green, J., & Watkins, S.C. (2013). *Connected learning: An agenda for research and design*. Digital Media and Learning Research Hub.
Kajamaa, A., & Kumpulainen, K. (2019). Agency in the making: Analyzing students' transformative agency in a school-based makerspace. *Mind, Culture, and Activity*, *26*(3), 266-281. https://doi.org/10.1080/10749039.2019.1647547
Lipman, P. (2011). *The new political economy of urban education: Neoliberalism, race, and the right to the city*. Routledge. https://doi.org/10.4324/9780203821800
Mezirow, J., & Cranton, P. (2012). Learning to think like an adult: Core concepts of transformative learning theory. In E. Taylor (Ed.), *Handbook of transformative learning: Theory, research, and practice* (pp. 73-96). Jonn Wiley & Sons. https://bit.ly/3he1WBa
Miño-Puigcercós, R., Rivera-Vargas, P., & Cobo, C. (2019). Virtual communities as safe spaces created by young feminists: Identity, mobility and sense of belonging (pp. 123-140). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-96113-2_8
Rajala, A., Hilppö, J., Lipponen, L., & Kumpulainen, K. (2012). Expanding the chronotopes of schooling for the promotion of students' agency. In O. Erstad, & J. Sefton-Green (Eds.), *Identity, community, and learning lives in the digital age* (pp. 107-125). Cambridge University Press. https://doi.org/10.1017/CBO9781139026239.009
Rasmussen, I. (2005). *Project work and ICT. Studying learning as participation trajectories*. [Doctoral dissertation, University of Oslo]. https://bit.ly/2ODRJBP
Rule, A.C. (2006). Editorial: The components of authentic learning. *Journal of Authentic Learning*, *3*(1), 1-10. https://bit.ly/3dgXDDn
Sancho-Gil, J.M., Rivera-Vargas, P., & Miño-Puigcercós, R. (2020). Moving beyond the predictable failure of Ed-Tech initiatives. *Learning, Media and Technology*, *45*, 61-75. https://doi.org/10.1080/17439884.2019.1666873
Selwyn, N. (2016). *Is technology good for education?* John Wiley & Sons. https://bit.ly/2ZDab3z
Shah, A. (2017). Ethnography? Participant observation, a potentially revolutionary praxis. *HAU: Journal of Ethnographic Theory*, *7*(1), 45-59. https://doi.org/10.14318/hau7.1.008
Stetsenko, A. (2019). Radical-transformative agency: Continuities and contrasts with relational agency and implications for education. *Frontiers in Education*, *4*, 1-13. https://doi.org/10.3389/feduc.2019.00148
Stornaiuolo, A., Smith, A., & Phillips, N.C. (2017). Developing a transliteracies framework for a connected world. *Journal of Literacy Research*, *49*(1), 68-91. https://doi.org/10.1177/1086296x16683419
Thomas, D., & Brown, J.S. (2011). https://bit.ly/30rjQcP
Virkkunen, J. (2006). Dilemmas in building shared transformative agency. *Activites*, *03*(1), 43-66. https://doi.org/10.4000/activites.1850, https://dx.doi.org/10.4000/activites.1850
Yin, R.K. (2014). *Case study research: sign and methods*. Sage.

AlfaMed

EuroAmerican Interuniversity Research Network
on Media Literacy for Citizenship

www.redalfamed.org

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

The challenge of inclusive dialogic teaching in public secondary school

El reto de la enseñanza dialógica inclusiva en la escuela pública secundaria

Dr. Chrysi Rapanta. Senior Researcher, Faculty of Social Sciences and Humanities, Universidade Nova de Lisboa (Portugal) (crapanta@fcsh.unl.pt) (https://orcid.org/0000-0002-9424-3286)
Dr. Mercè Garcia-Mila. Full Professor, Developmental and Educational Psychology Department, University of Barcelona (Spain) (mgarciamila@ub.edu) (https://orcid.org/0000-0001-7628-7552)
Dr. Ana Remesal. Junior Lecturer, Developmental and Educational Psychology Department, University of Barcelona (Spain) (aremesal@ub.edu) (https://orcid.org/0000-0002-5090-2147)
Cláudia Gonçalves. Predoctoral Researcher, Faculty of Social Sciences and Humanities, Universidade Nova de Lisboa (Portugal) (claudiagoncalves@fcsh.unl.pt) (https://orcid.org/0000-0003-0936-9843)

ABSTRACT

The challenge of creating more inclusive public schools addressing the needs of the 21st century Knowledge Society is a major one. In this paper, we focus on inclusion as a dialogical process to be adopted and developed by teachers and students alike in any classroom. The idea of inclusive dialogic teaching is explained and operationalised in an inclusive dialogic curriculum focusing on cultural literacy learning dispositions. In this study, which is part of a multi-country European project, eight Spanish and Portuguese secondary school teachers and their students participated in eight sessions performing dialogic lesson plans. Teachers attended two professional development sessions, one at the beginning of the project and another one later on. Classroom discourse data from sessions #3 and #8 were collected and analyzed using a pre-constructed coding scheme. The findings show a slight improvement in dialogicity from session #3 to session #8 with a persisting resistance from teachers to be more cumulative in their discourse. These findings confirm previous work showing that dialogic teaching is acquired gradually, and even when there are changes in teachers' stance being more inclusive and inviting towards students, these changes do not necessarily represent a radical shift in the teaching methods towards being more student-centered.

RESUMEN

El reto de promover escuelas públicas más inclusivas que aborden las necesidades de la Sociedad del Conocimiento del siglo XXI es importante. En este artículo nos centramos en la inclusión como un proceso de diálogo que tanto docentes como estudiantes deben adoptar y desarrollar por igual en las aulas. La idea de la enseñanza dialógica inclusiva se explica y operacionaliza en un currículo dialógico inclusivo centrado en las disposiciones de alfabetización cultural. En este estudio, que forma parte de un proyecto europeo de varios países, ocho docentes de secundaria españoles y portugueses y sus estudiantes participaron en ocho sesiones que implementan planes de lecciones dialógicas. El profesorado asistió a dos sesiones de desarrollo profesional, una al comienzo del proyecto y otra más adelante. Los datos del discurso en el aula de las sesiones n.° 3 y n.° 8 se recopilaron y analizaron utilizando un protocolo de codificación validado. Los resultados muestran una ligera mejora en la dialogicidad de la sesión n.° 3 a la sesión n.° 8 con una resistencia persistente de los docentes para ser más acumulativos en su discurso. Estos hallazgos confirman el trabajo previo que muestra que la enseñanza dialógica se desarrolla gradualmente e incluso cuando la postura del profesorado pasa a ser más inclusiva y atractiva para el alumnado, este cambio no representa necesariamente un cambio radical en los métodos de enseñanza centrados en el alumnado.

KEYWORDS | PALABRAS CLAVE

Dialogic teaching, inclusive education, secondary school, teaching practice, teaching professional development, dialogue.

Enseñanza dialógica, educación inclusiva, escuela secundaria, práctica docente, desarrollo profesional docente, diálogo.

Received: 2020-05-29 | Reviewed: 2020-06-05 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-02 | Pages: 21-31

1. Introduction

The challenge of creating more inclusive public schools addressing the needs of the 21st century Knowledge Society is a major one. Extensive work has been reported regarding the promotion of social inclusion policies in education mainly in two directions: a) Towards the inclusion of "objectively" excluded populations such as immigrants, low-income, and socially, mentally or physically disadvantaged students (Camilli-Trujillo & Römer-Pieretti, 2017; Castillo-Rodríguez & Garro-Gil, 2015); b) Towards the inclusion of "subjectively" excluded populations in aspects such as media, digital or critical literacy skills (Dias-Fonseca & Potter, 2016) (for the distinction between objective and subjective inclusion see Licsandru & Cui, 2018). However, inclusion does not only regard specific groups of learners and their limited access to material or non-material resources, including knowledge and skills; recent efforts of public schools towards a more inclusive education tend to focus on the classroom climate and the fostering of "learning for all" opportunities, for example through whole-class dialogue (Mitchell & Sutherland, 2020).

Dialogic teaching can be broadly defined as an approach for "teaching and learning through, for and as dialogue" (Kim & Wilkinson, 2019: 70). Although there are different approaches to dialogic teaching (Asterhan et al., 2020; Kim & Wilkinson, 2019), authors agree on the following aspects: 1) Dialogic teaching must be intentional (Bakker et al., 2015; Reznitskaya, 2012); 2) Learnt (Fisher, 2007; Simpson, 2016); 3) Assessable (Lehesvuori et al., 2011) as per its adherence to principles and routine practices with a dialogic quality (Alexander, 2017). Students' agency, manifested in them acting "authoritatively and accountably (problematizing and solving issues)" (Kumpulainen & Lipponen, 2010: 50) is the other necessary side for dialogic teaching to emerge in a successful way. The role of teachers in allowing and fostering productive and constructive dialogue is essential in this regard (Reznitskaya & Gregory, 2013; Sedova et al., 2016).

Several scholars have argued that dialogic teaching is difficult and gradual to develop (Clarke et al., 2016; Reznitskaya & Wilkinson, 2015; Sedova, 2017; Wilkinson et al., 2017). Such difficulty is even greater when it comes to teachers orchestrating whole-class discussions (Clarke et al., 2016; Sedova et al., 2016), and it is mainly related to the effective facilitation and mediation of students' contributions with the aim of reinforcing their own participation and accountability (Michaels et al., 2008). For instance, it has been observed that even when teachers become able to open genuine dialogical discussions with at least three students participating in those for at least 30 seconds (Sedova et al., 2016), teachers' and students' capacity to refer back to the discussion contents in ways that incentivise genuine contribution of ideas by the same or different students remains limited (Lehesvuori et al., 2013; Sedova et al., 2014). This capacity refers to the concept of 'cumulativity' of discourse introduced by Alexander (2017), which forms one of the main principles of dialogic teaching, together with: 'purposefulness' (i.e. teachers planning and steering classroom talk with specific educational goals in mind), 'collectiveness' (i.e. teachers and children addressing learning tasks together), 'reciprocity' (i.e. teachers and children listening to each other, sharing ideas and considering alternatives), and 'supportiveness' (i.e. students expressing their ideas freely without the fear of wrong answers and helping each other to reach common understandings).

The present study is part of a multi-country, cross-sectional (pre-primary, primary and secondary) large-scale intervention project focusing on the acquisition of dialogic teaching practices and implementation with the goal of fostering cultural literacy learning skills among students. As part of this project, cultural literacy was defined as a dynamic set of dispositions, resulting from social, dialogical practice which leads the individuals to an empathetic, tolerant and inclusive acceptance of "the other" (Maine et al., 2019). This study focuses on inclusion as a teacher's disposition towards students, as manifested in inclusive dialogic teaching talk moves resulting in more or less dialogic student moves in Portuguese and Spanish secondary classrooms.

2. Literature review

2.1. Inclusion as a value in education

Between 1970 and 1990 mainly, the European Union promoted the idea of social inclusion and, since then, it is an established concept in European politics (Wright & Stickley, 2013). The literature about inclusion is extensive and covers a wide range of areas, such as social, political, organisational, educational

or health; and issues, such as poverty, multiculturalism, inclusive education, people with disabilities and/or mental illness. In educational contexts, there are several studies about inclusive education and integration of children and youth with special educational needs (Castillo-Rodríguez & Garro-Gil, 2015; Woodcock & Woolfson, 2019). In health, several publications on mental illness and social inclusion and exclusion are available (Davey & Gordon, 2017), and in organisational contexts inclusion also emerges as a concern or as an aim (Schmidt et al., 2016). In education, inclusion is defined not only as an active process of change or integration, but also as a result, such as the sense of belonging (Osler & Starkey, 1999). This view is shared by Freire (2008), who describes inclusion as an educational, political and social movement that defends the right of all individuals to consciously and responsibly participate in society and to be accepted and respected in what differentiates them from others. According to the author, inclusion is based on values such as respect and celebration of differences, and collaboration between individuals, social groups and institutions. This view on inclusion, also adopted in the present study, goes beyond individual differences in terms of special education needs (which is better defined as "integration" rather than inclusion, see (Castillo-Rodríguez & Garro-Gil, 2015), and addresses all individuals and their efforts to participate in social dialogue fostering collaboration. To facilitate collaboration, individuals should value diversity, respect others, and demonstrate an interest in overcoming their prejudices and reaching compromise solutions (European Union, 2006). The main goal of inclusion is that no culture -in its broad sense, i.e. not limited to ethnicity- overlaps or imposes itself on another (Seeland et al., 2009; Vázquez, 2001). According to Tienda (2013), in order to promote inclusion and increase tolerance, it is necessary that individuals from different backgrounds (geographical, religious, political, social, etc.) interact in such a way that challenges pre-existing stereotypes.

2.2. Inclusive dialogic teaching

Inclusive dialogic teaching is about the promotion of a social or inclusive dialogic pedagogy that goes beyond knowledge transmission (Osborne, 2007; Simpson, 2016). Reporting the outcomes of their UK-based project titled "Classroom talk, social disadvantage and educational attainment: raising standards, closing the gap", Alexander et al. (2017) mention that students' preparedness to listen to others improved, and their interaction became more inclusive, with fewer students being isolated, silent or reluctant to participate. Moreover, "with an increased emphasis on a supportive, reciprocal talk culture, pupils gained in confidence and became more patient and better attuned to each other's situations and keen to provide mutual support in both talking and learning" (Alexander et al., 2017: 6). Similar results were obtained by the "Schooling for a Fair Go" project in Australia (Vass, 2018). For those teachers, dialogic teaching was a "transformative journey towards engaging classroom practices" (Vass, 2018: 109), and this transformation included both teachers and students. As one of the Australian teachers described, her participation in the dialogic teaching project was like a rainbow to take a journey over, for both her students and herself. Similarly, in a dialogic teaching project in Finland (Kumpulainen & Rajala, 2017) called "The Forest Project", the analysis of classroom discourse data showed how important it was that teachers managed to identify and negotiate students' diverse discursive identities within productive interactions in science.

In general, teachers' adoption of a dialogic stance has shown to help students develop their own meaning-making processes and disposition towards "a dialogic how, a personally engaging what, and an inclusive whose" (Boyd, 2016: 3). As part of this active dialogic stance allowing space for students' participation and agency, teachers are called to also adopt a facilitative stance (Blanton & Stylianou, 2014), i.e. implementing specific talk moves or dialogue prompts to structure or orient interaction towards more productive and constructive directions. Finally, as part of this facilitation, teachers are also encouraged to show a critical stance (Fisher, 2007; Haneda et al., 2017), i.e. enacting a critical thinking attitude towards students' claims and their justifications, asking them questions like "how do you know?" or even challenging their viewpoints opening up the dialogue space for constructive disagreement. Inclusion as a dialogic teaching approach is present in the three stances described above: an inclusive dialogic stance is the one that allows egalitarian participation and agency. An inclusive facilitative stance is the one that fosters interaction among students, even in a whole-class discussion format; and an inclusive critical stance is the one proving that for someone to be able to evaluate what others say, and how it is different from

what (s)he says, (s)he first needs to truly understand what the alternatives to one's own viewpoint are. In other words, for authentic dialogue and argumentation to emerge in the classroom, an attitude of openness towards "otherness" (Wegerif, 2010) is an essential ingredient of both the teacher's and students' discursive behavior.

Overall, although inclusion has been largely described as an education policy and practice goal, its framing as an integrated part of teachers' stance and subsequently classroom discourse has not received much attention. This is the gap that this study aims to address.

3. Methodology

3.1. Research goal and context

The study's goal was twofold: first, to identify whether inclusive dialogic teaching is a suitable method at secondary school, given that most studies focus on primary school teachers; and second, to explore whether and how the practice of dialogic teaching in time leads to more/different inclusive dialogic classroom practices. According to these goals, our guiding research questions are:

- RQ1: Does professional development designed to promote dialogic teaching have an effect on teachers' and students' degree of dialogicity?
- RQ2: Which are the most common talk moves manifested by teachers and students throughout the dialogic lessons?

Within the cultural literacy learning program developed as part of this project, dialogue and constructive argumentation were conceived as the basis for fostering an inclusive dialogic stance from both teachers and students. The classroom was conceived as a safe environment where students could express themselves without being judged and where all ideas were accepted as valid. In order to work towards this dialogic ethos, the development of "ground rules for talk" (Littleton & Mercer, 2013) were included as part of the program. This activity involves teachers with their students establishing rules on how they should interact. Some examples of rules may include: "Everyone contributes to the discussion", "All ideas are respected and considered" and so on. Each dialogic lesson was structured upon a cultural literacy multimodal text, which was either a wordless picture book or a wordless, animated short film promoting the values of inclusion, tolerance and empathy and their inter-connected values and dispositions such as social responsibility, active participation or sustainable development.

As part of their professional development, the participant teachers were guided through 15 pre-constructed lesson plans, for which inclusive dialogic teaching was a central part. All lesson plans had primary and secondary questions that the teacher could ask to guide whole-class discussion, as well as concrete dialogic and argumentative small-group activities to follow up that discussion. Among the techniques that became available to teachers to use as part of their whole-class discussions were: talking points (https://bit.ly/32hjule), thought-provoking questions (https://bit.ly/2AXcOnj), and circle of viewpoints (https://bit.ly/3j2IMzV). One of the innovative aspects of the dialogic curriculum we developed as part of this project was the fact that several dialogic teaching techniques were used both from the dialogue and argumentation research fields. Moreover, these techniques were integrated as part of pre-constructed lesson plans in which an attractive and open to several interpretations cultural text (either a book or a film) was the main object of discussion. Finally, it is also noteworthy that the 45 total lesson plans, 15 for each age group, were constructed together with volunteering teachers in co-design sessions in a piloting phase prior to the implementation of the program. In this way, the teachers' voice and expertise with the specific age groups were reflected in the lesson plans.

3.2. Participants

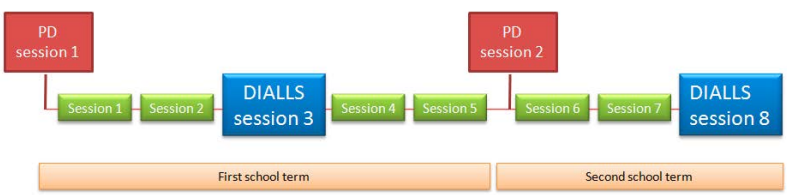
Eight secondary teachers (four Spanish and four Portuguese) and their students participated in the study reported here. All teachers and their students signed corresponding consent forms at the beginning of the project confirming their voluntary participation and right to withdraw from the project at any moment. In the case of the students, informed consents were signed by their parents/caregivers. Table 1 presents a basic description of the participants.

Table 1. Participants' characteristics						
Class	Teacher	Number of students	Previous experience with dialogical teaching	Country	School level	Location
Class 1(C1)	Teacher 1	27	No	Spain	9th grade	Urban
Class 2(C2)	Teacher 2	32	No	Spain	9th grade	Urban
Class 3(C3)	Teacher 3	12	No	Spain	9th grade	Suburban
Class 4(C4)	Teacher 4	15	No	Spain	9th grade	Suburban
Class 5(C5)	Teacher 5	26	No	Portugal	10th grade	Urban
Class 6(C6)	Teacher 6	28	No	Portugal	8th grade	Urban
Class 7(C7)	Teacher 7	29	No	Portugal	9th grade	Urban
Class 8(C8)	Teacher 8	31	No	Portugal	8th grade	Suburban

3.3. Design and data collection

We carried out an instructional design study, based on observational methodology. Although the project was planned for three phases, the Covid-19 lockdown affected its full implementation. In this paper, we analyse data concerning the actual data collection which comprises phases 1 and 2. A total of eight sessions were implemented by each teacher. Altogether 16 sessions were video-recorded, corresponding to two sessions per class. Professional development sessions took place twice, at the beginning of the program and before session #6. According to the original project, only session #3 and session #8 were considered for data collection. Figure 1 depicts the chronological development.

Figure 1. Timeline of the project



3.4. Analysis

All classroom discursive activity in sessions #3 and #8 was transcribed and coded according to the Low Inference Discourse Observation (LIDO) tool (O'Connor & LaRusso, 2014).

Table 2. Discursive data set of talk moves						
Class ID	Whole class moves session #3	Coded moves session #3	Coded moves proportion session #3	Whole class moves session #8	Coded moves session #8	Coded moves proportion session #8
C1	176	73	0.41	296	95	0.32
C2	374	282	0.75	223	195	0.87
C3	341	280	0.82	151	107	0.71
C4	232	212	0.91	77	64	0.83
C5	105	45	0.43	198	93	0.47
C6	108	67	0.62	56	40	0.71
C7	228	116	0.51	278	162	0.58
C8	277	119	0.43	42	22	0.52

The LIDO coding scheme provides ordinal categories for the teacher (from 1 to 6): (T1) Encouraging students to react to their classmates' contributions; (T2) prompting and following up to deepen contribution; (T3) active listening to keep interaction; (T4) posing open questions; (T5) posing semi-open questions; (T6) posing single-answer questions.

The same scheme captures the student's discursive action (from 1 to 5): (S1) Direct classmates' interpellation; (S2) indirect reference to a classmate's previous intervention; (S3) argumentative claim; (S4) elaborated utterance presenting full ideas; (S5) minimal utterance response (up to simple clause). All these categories indicate the degree of dialogicity in the classroom discourse. Categories T1, T2, and T3 describing teacher moves and S1, S2, and S3 describing student moves are considered as more dialogical

than the T4, T5, and T6, and S4 and S5, correspondingly. The inter-rater reliability among four trained coders was calculated, reaching a satisfying result (Krippendorf's α=0.77), and any discrepancies among the coders were resolved through discussions until final full agreement.

Table 2 shows the total number of talk moves, selected and coded per each class (the analysis only focused on the whole-class discussions and the coding excluded utterances that did not represent any dialogue moves according to the LIDO's categories).

4. Results

The Findings section is structured into two parts. In the first part we present the distribution of the proportions of LIDO's categories for teachers and students, respectively (see Table 3 and Table 4), as well as the means' comparison between the two sessions in line with our first research question. In the second part, we focus on the type of categories emerged throughout the sessions in line with our second research question.

Table 3. Distribution of teacher moves categories (proportions)

Class ID	Session #3						Session #8					
	T1	T2	T3	T4	T5	T6	T1	T2	T3	T4	T5	T6
C1	0.12	0.12	0.15	0.33	0.15	0.15	0.00	0.13	0.62	0.38	0.09	0.39
C2	0.12	0.04	0.10	0.04	0.14	0.08	0.09	0.13	0.73	0.65	0.13	0.07
C3	0.28	0.18	0.45	0.03	0.23	0.07	0.04	0.18	0.33	0.33	0.23	0.17
C4	0.16	0.10	0.49	0.00	0.19	0.16	0.40	0.43	0.12	0.50	0.17	0.04
C5	0.12	0.04	0.13	0.08	0.04	0.00	0.08	0.12	0.54	0.87	0.00	0.00
C6	0.92	0.12	0.29	0.41	0.04	0.00	0.43	0.14	0.60	0.68	0.10	0.02
C7	0.16	0.10	0.34	0.19	0.05	0.16	0.19	0.33	0.64	0.69	0.00	0.06
C8	0.17	0.17	0.27	0.13	0.12	0.12	0.00	0.20	0.17	0.65	0.40	0.00

To reply to RQ1, we conducted a paired-samples non-parametric test (Wilcoxon) for each category comparing proportions for sessions #3 and #8. We can observe the Mean proportions in Figure 2. The Wilcoxon non-parametric test comparison of teachers' and students' talk moves across session #3 and session #8 yielded significant results only for one category for teachers (T4, Z=2.4, p=.018) and none for students.

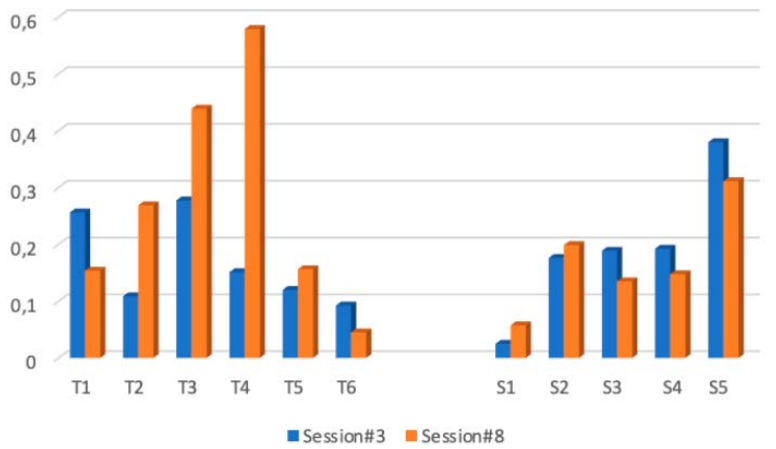
Table 4. Distribution of student moves categories (proportions)

Class ID	Session #3					Session #8				
	S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
C1	0.00	0.09	0.03	0.22	0.35	0.00	0.32	0.10	0.22	0.35
C2	0.02	0.14	0.05	0.07	0.07	0.06	0.51	0.09	0.07	0.20
C3	0.03	0.41	0.22	0.10	0.36	0.05	0.27	0.22	0.09	0.35
C4	0.03	0.54	0.75	0.15	0.47	0.00	0.38	0.17	0.14	0.29
C5	0.04	0.08	0.11	0.37	0.20	0.00	0.00	0.34	0.25	0.41
C6	0.00	0.10	0.16	0.40	0.17	0.00	0.00	0.00	0.05	0.52
C7	0.00	0.05	0.07	0.15	0.72	0.18	0.11	0.16	0.20	0.34
C8	0.08	0.00	0.12	0.08	0.70	0.17	0.00	0.00	0.16	0.66

In order to test whether this statistical difference was an isolated finding or not, we also compared the three most dialogic categories for teachers (namely T1, T2, and T3) between session #3 and session #8. The Mean (Standard Deviation) for the categories T1, T2 and T3 for session #3 was 18.5 (6.6) and for session #8 it was 27.6 (9.4).

The non-parametric Wilcoxon comparison test yielded significant results (Z=-1.8; $p_{one-tail}$=.05), therefore confirming a potential progress in teachers' dialogicity in time. We should note, however, a slight decrease in the Mean proportion of T1 (Figure 2), which can be explained by a slight increase in the Mean proportion of S1 (Figure 2).

Figure 1. Timeline of the project



To reply to RQ2, we looked at the type of teacher and student talk moves emerged in both sessions, with illustrating examples for each from our bilingual (Spanish and Portuguese) dataset. For the teachers' categories, the overall (both sessions #3 and #8) frequencies were: T1=43, T2=87, T3=311, T4=116, T5=129, and T6=92. Correspondingly, the total frequencies for the students' categories were: S1=46, S2=209, S3=174, S4=153, and S5=142. We can see that across the two sessions observed, the most common talk move among teachers was T3 (Active listening to keep interaction), which was mostly replied to with a minimal response by students (S5), also the most frequently used move by the students in our dataset. Among the students' categories, the second most frequent move after S5 was S2 (Student refers to another student's contribution), a much higher dialogical move. Although the statistical analysis did not yield differences across sessions, we observed changes in the frequencies of students' moves from session #3 to session #8 (Figure 2). The low dialogical S5 move decreased, while the high dialogical S2 increased.

From a qualitative point of view, we observed that teachers tended to use a mainly teacher-centered discussion with a "radial" pattern of discourse, rather than a student-driven discussion. This pattern, predominant in session #3, could be described as: Teacher-Student A-Teacher-Student B-Teacher-Student C, etc. However, we observed a weak tendency towards a less radial and more homogeneously distributed discourse pattern in the subsequent session #8, which could be described as follows: Teacher-Student A-Student B-Student C-Teacher. Moreover, in this latter pattern, more dialogic teacher categories emerged (i.e., T1, T2 and T3). Below, we present two excerpts from the same class to illustrate the difference in the whole class discourse pattern between session #3 and session #8.

Excerpt 1. Example of a radial teacher centered discourse, in session #3:

- Teacher: You should keep taking notes with the ideas so you could use them later. This one could be the first idea. Have you seen any change? You've seen a change, haven't you? (T5)
- Student A: Pollution (S5)
- Teacher: Pollution. OK, at the top, at the bottom, everywhere? (T2)
- Student B: Everywhere (S5)
- Teacher: Have you seen any change since the beginning of the book? (T6)
- Student C: Yes, the house gets bigger and bigger (S4)
- Teacher: Bigger and bigger? (T3)
- Student A: And grayer. (S5)
- Teacher: Grayer? Caused by what? (T3)

In the low dialogical Excerpt 1, it is as if the teacher needed to limit the students' opportunities to engage in dialogue, not to risk losing control of the conversation. Generally, in session #3, all teachers in our sample did most of the talking and led the discussion by minimizing the amount of talk from students. In contrast,

in the subsequent session #8, teachers allowed more space for students to interact not only with them but also among themselves. The excerpt below shows a quite different discourse pattern, much less radial, in which the teacher allows space for students' reacting to each other's viewpoints, therefore contributing authentically and "accountably" (Kumpulainen & Lipponen, 2010) to the joint discourse.

Excerpt 2. Example of a student-centered discourse pattern, in session #8:

- Teacher: You know all the rules of dialectical conversations, don't you? Basically, all options, opinions have to be respected and they have to be argued, okay? What do you think the meaning of the film is? (T5)
- Student A: I think that it is like a representation of many people going to work away from home and working in a job that they may like but being a long time alone and away from home and excluded. This is why he seems sad. (S3)
- Teacher: Very good, very interesting. Does the other group agree? (T1)
- Student B: We think that... well... it's a person or whatever works on the moon turning it on and off every day so it's day and night and... of course it's alone and through music he feels better and expresses his feelings. (S3)
- Teacher: What makes you think that he is sad and melancholic? (T2)
- Student A: He was playing sad songs with his trumpet. (S4)
- Student C: Also, he is crying and he misses home (S2)
- Student A: Well, not only in that moment, his life is sad, he wakes up and does not smile at all. It is very dark, no lights, nothing happens (S3)
- Student D: And boring (S2)
- Teacher: Very good! So, what makes a house be a home? (T4)

In this second excerpt, we can observe some teacher moves that showed efforts to elicit elaborated reasoning from students. When we compare session #3 with session #8, we can observe that teachers are beginning to use discourse strategies in line with the dialogic teaching professional development, i.e. focusing on both dialogicity and cumulativity of joint discourse.

5. Discussion

Focusing on inclusion as a classroom dialogic practice in European public schools, our study showed that teachers gradually improved inclusive talk moves, such as the open questions and active listening, throughout their engagement in a dialogic teaching program explicitly aiming at students' development of cultural literacy dispositions. This trend of progress across sessions towards a more dialogical classroom discourse can be explained by the nature of the dialogic curriculum in which dialogue and argumentation goals were explicit learning outcomes of each lesson plan. As Sandoval et al. (2018) argue, for teachers to reorganise their discursive practices into more dialogical ones, a well-structured professional development (PD) with clear instructions of lesson plans is necessary. Our PD lasted for 18 hours, and the lesson plans were carefully and explicitly designed and shared, which was probably the reason of the progress observed. Therefore, we can conclude that with a well-structured, lesson-plan-oriented PD, dialogic teaching in secondary schools is possible even in a short time and with no previous experience necessary. These results contribute to the current discussion about whether dialogic teaching and learning is an easy practice to acquire, and they offer optimistic insights when it comes to the effectiveness of a relatively short teacher PD for the fulfilment of concrete objectives (in our case, the implementation of pre-constructed lesson plans). Other studies with secondary school teachers following PD programs with a general focus on dialogic teaching principles without the concrete frame of lesson sequences constructed for that scope yielded some positive findings only after a considerable amount of time (e.g. at the end of one year in Sedova et al., 2016, and in Wilkinson et al., 2017, the PD lasted 30 hours).

Nonetheless, the observed improvement in teachers' inclusive talk moves was not generalized nor for the totality of the moves, neither for students' moves towards each other. This non-significant increase of more dialogical categories when it comes to both teachers and students is confirmed by previous studies that mention that the emergence of cumulative discourse, i.e. discourse building on previous contributions, is a difficult practice to achieve (Alexander, 2017; Lehesvuori et al., 2013; Sedova et al., 2016).

Along with those findings, some important considerations also need to be made. A first one has to do with the relatively small sample of the study (eight classrooms) and the exclusive focus on dialogue data. Our future research will focus on a multi-country corpus of approximately 200 classrooms who have participated thus far in the project, along with evaluation survey data from both teachers and students. A second important consideration is related to the impossibility of confirming any further dialogic teaching improvement at a later phase of the program, as it was initially planned but cancelled due to the Covid-19 lockdown. All participant teachers received a third PD before the session #11 of the program, the benefits of which will remain unknown. Part of our future work will consist in following those teachers in their new classes of the next year to see whether some of the learned dialogic teaching routines will be transferred to a different context without the support of a dialogic lesson plan. Based on other studies (Sedova et al. 2016; Wilkinson et al., 2017) our hypothesis is that for such transfer to be possible, and therefore for dialogic teaching learning to be sustainable, a deep shift in teachers' epistemological beliefs regarding teaching and learning is necessary. The instruction provided in this study based on the implementation of dialogic lesson plans can be considered as effective for the purposes of the program, as students improved in their consideration of others' in their own discourse, but maybe less effective in terms of the development of a dialogical, facilitatory, and critical stance from part of the teachers in the long term. In addition to that, there is always the risk of proceduralization of learning (Bereiter, 2002), mainly for the teachers, in the sense that they can apply the dialogical routines described in the pre-constructed lesson plans without a deep understanding of the principles and goals behind them.

6. Conclusion

When it comes to inclusion as both a goal and an outcome of dialogue in the classroom, our study shows that the more teachers become inclusive in their discourse, the more students imitate this strategy with their classmates. The fact that the lesson plans that formed part of our dialogic teaching program explicitly used inclusion, empathy, and tolerance as their learning goals certainly played a role in that. Instead of students being told that they would learn certain concepts related to history, physics or mathematics, they were told that the class was about listening to each other, exploring alternatives, or reaching consensus. Gradually, students became aware that learning how to live together with others is something that must be learned, and they dedicated part of their ordinary curriculum for that purpose. It is also relevant to mention that the program received a highly positive reception from the students, and cultural literacy dispositions became part of their everyday language. In a newspaper article about the project's implementation in Portugal, low secondary school students who participated in the project said that "it doesn't matter if you are right or wrong because everyone has a right to say what (s)he thinks" (Viana, 2020: 14). In nowadays' society, when everyday becomes more vulnerable and uncertain, giving space to young people's voices can be a catalyst for change and progress.

To conclude, the dialogic teaching practices observed in this study as result of teachers' and students' engagement in a dialogic curriculum focusing on inclusion, empathy and tolerance cannot be considered yet as full shifts towards a more dialogic, inclusive classroom. They are, however, as Sedova et al. (2014) first proposed, "embryonic forms" which certainly can mark a positive direction towards authentic dialogue and inclusive participation. A view of inclusion as a classroom dialogic practice needs to be further considered, also in line with extensive existing research in the field of adaptive and inclusive education (Mitchell & Sutherland, 2020).

Funding Agency

This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant agreement No 770045

This study was funded by the European Union Research and Innovation Action Program with Grant number 77045. The authors would also like to acknowledge the support by the Portuguese Fundação para a Ciência e a Tecnologia (DL 57/2016/CP1453/CT0066) and the support by the Spanish Ministerio de Ciencia, Innovación y Universidades (RTI2018-097289-B-I00).

References

Alexander, R.J. (2017). *Towards dialogic teaching: Rethinking classroom talk*. Dialogos.

Alexander, R.J., Hardman, F.C., & Hardman, J. (2017). *Changing talk, changing thinking: Interim report from the in-house evaluation of the CPRT/UoY Dialogic Teaching Project*. University of York and Cambridge Primary Review Trust. https://bit.ly/2ZDfqkl

Asterhan, C.S., Howe, C., Lefstein, A., Matusov, E., & Reznitskaya, A. (2020). Controversies and consensus in research on dialogic teaching and learning. *Dialogic Pedagogy*, *8*, 1-16. https://doi.org/10.5195/dpj.2020.312
Bakker, A., Smit, J., & Wegerif, R. (2015). Scaffolding and dialogic teaching in mathematics education: Introduction and review. *ZDM*, *47*(7), 1047-1065. https://doi.org/10.1007/s11858-015-0738-8
Bereiter, C. (2002). Artifacts, canons, and the progress of pedagogy: A response to contributors. In *Liberal education in a knowledge society* (pp. 223-244). Open Court. https://bit.ly/3j2qI93
Blanton, M.L., & Stylianou, D.A. (2014). Understanding the role of transactive reasoning in classroom discourse as students learn to construct proofs. *The Journal of Mathematical Behavior*, *34*, 76-98. https://doi.org/10.1016/j.jmathb.2014.02.001
Boyd, M. (2016). Connecting 'Man in the mirror': Kindling a classroom dialogic teaching and learning trajectory. *L1-Educational Studies in Language and Literature*, *16*, 1-26. https://doi.org/10.17239/L1ESLL-2016.16.02.03
Camilli-Trujillo, C., & Römer-Pieretti, M. (2017). Meta-synthesis of literacy for the empowerment of vulnerable groups. [Metasíntesis en alfabetización para el empoderamiento de grupos vulnerables]. *Comunicar*, *53*, 9-18. https://doi.org/10.3916/c53-2017-01
Clarke, S.N., Howley, I., Resnick, L., & Rosé, C.P. (2016). Student agency to participate in dialogic science discussions. *Learning, Culture and Social Interaction*, *10*, 27-39. https://doi.org/10.1016/j.lcsi.2016.01.002
Davey, S., & Gordon, S. (2017). Definitions of social inclusion and social exclusion: The invisibility of mental illness and the social conditions of participation. *International Journal of Culture and Mental Health*, *10*(3), 229-237. https://doi.org/10.1080/17542863.2017.1295091
Dias-Fonseca, T., & Potter, J. (2016). Media education as a strategy for online civic participation in Portuguese schools [La educación mediática como estrategia de participación cívica on-line en las escuelas portuguesas]. *Comunicar*, *49*, 9-18. https://doi.org/10.3916/C49-2016-01
European Union (Ed.) (2006). Recommendation of the European Parliament and of the Council of 18th December 2006 on key competences for lifelong learning. *Official Journal of the European Union*, *30*. https://doi.org/10.1177/1465116506060911
Fisher, R. (2007). Dialogic teaching: Developing thinking and metacognition through philosophical discussion. *Early Child Development and Care*, *177*(6-7), 615-631. https://doi.org/10.1080/03004430701378985
Freire, S. (2008). Um olhar sobre a inclusão. *Revista da Educação*, *16*(1), 5-20.
Haneda, M., Teemant, A., & Sherman, B. (2017). Instructional coaching through dialogic interaction: Helping a teacher to become agentive in her practice. *Language and Education*, *31*(1), 46-64. https://doi.org/10.1080/09500782.2016.1230127
Kim, M.Y., & Wilkinson, I.A. (2019). What is dialogic teaching? Constructing, deconstructing, and reconstructing a pedagogy of classroom talk. *Learning, Culture and Social Interaction*, *21*, 70-86. https://doi.org/10.1016/j.lcsi.2019.02.003
Kumpulainen, K., & Lipponen, L. (2010). Productive interaction as agentic participation in dialogic enquiry. In K. Littleton, & C. Howe (Eds.), *Educational dialogues: Understanding and promoting productive interaction* (pp. 48-63). Routledge. https://doi.org/10.4324/9780203863510
Kumpulainen, K., & Rajala, A. (2017). Dialogic teaching and students' discursive identity negotiation in the learning of science. *Learning and Instruction*, *48*, 23-31. https://doi.org/10.1016/j.learninstruc.2016.05.002
Lehesvuori, S., Viiri, J., & Rasku-Puttonen, H. (2011). Introducing dialogic teaching to science student teachers. *Journal of Science Teacher Education*, *22*(8), 705-727. https://doi.org/10.1007/s10972-011-9253-0
Lehesvuori, S., Viiri, J., Rasku-Puttonen, H., Moate, J., & Helaakoski, J. (2013). Visualizing communication structures in science classrooms: Tracing cumulativity in teacher-led whole class discussions. *Journal of Research in Science Teaching*, *50*(8), 912-939. https://doi.org/10.1002/tea.21100
Licsandru, T.C., & Cui, C.C. (2018). Subjective social inclusion: A conceptual critique for socially inclusive marketing. *Journal of Business Research*, *82*, 330-339. https://doi.org/10.1016/j.jbusres.2017.08.036
Littleton, K., & Mercer, N. (2013). *Interthinking: Putting talk to work*. Routledge. https://doi.org/10.4324/9780203809433
Maine, F., Cook, V., & Lähdesmäki, T. (2019). Reconceptualizing cultural literacy as a dialogic practice. *London Review of Education*, *17*(3), 383-392. https://doi.org/10.18546/lre.17.3.12
Michaels, S., O'Connor, C., & Resnick, L.B. (2008). Deliberative discourse idealized and realized: Accountable talk in the classroom and in civic life. *Studies in Philosophy and Education*, *27*(4), 283-297. https://doi.org/10.1007/s11217-007-9071-1
Mitchell, D., & Sutherland, D. (2020). *What really works in special and inclusive education: Using evidence-based teaching strategies*. Routledge. https://doi.org/10.4324/9780429401923
O'connor, C., & Larusso, M. (2014). Working with a low-inference discourse observation tool: What can we see? [Paper session] Annual Educational Research Association, Philadelphia, PA.
Osborne, J. (2007). Towards a more social pedagogy in science education: the role of argumentation. *Revista Brasileira de Pesquisa em Educação em Ciências*, *7*. https://bit.ly/2X6nTLh
Osler, A., & Starkey, H. (1999). Rights, Identities and Inclusion: European action programmes as political education 1. *Oxford Review of Education*, *25*(1-2), 199-215. https://doi.org/10.1080/030549899104215
Reznitskaya, A. (2012). Dialogic teaching: Rethinking language use during literature discussions. *The Reading Teacher*, *65*(7), 446-456. https://doi.org/10.1002/trtr.01066
Reznitskaya, A., & Gregory, M. (2013). Student thought and classroom language: Examining the mechanisms of change in dialogic teaching. *Educational Psychologist*, *48*(2), 114-133. https://doi.org/10.1080/00461520.2013.775898
Reznitskaya, A., & Wilkinson, I. (2015). Professional development in dialogic teaching: Helping teachers promote argument literacy in their classrooms. In *The SAGE handbook of learning* (pp. 219-232). Sage. https://doi.org/10.4135/9781473915213.n21
Rodriguez, C.C., & Garro-Gil, N. (2015). Inclusion and integration on special education. *Procedia - Social and Behavioral Sciences*, *191*, 1323-1327. https://doi.org/10.1016/j.sbspro.2015.04.488

Sandoval, W.A., Kwako, A.J., Modrek, A.S., & Kawasaki, J. (2018). Patterns of classroom talk through participation in discourse-focused teacher professional development. In J. Kay, & R. Luckin (Eds.), *Rethinking learning in the digital age: Making the learning sciences count, 13th International Conference of the Learning Sciences (ICLS)*. International Society of the Learning Sciences. https://bit.ly/38ZczEO

Schmidt, B.J., MacWilliams, B.R., & Neal-Boylan, L. (2017). Becoming inclusive: A code of conduct for inclusion and diversity. *Journal of Professional Nursing*, *33*(2), 102-107. https://doi.org/10.1016/j.profnurs.2016.08.014

Sedova, K. (2017). A case study of a transition to dialogic teaching as a process of gradual change. *Teaching and Teacher Education*, *67*, 278-290. https://doi.org/10.1016/j.tate.2017.06.018

Sedova, K., Salamounova, Z., & Svaricek, R. (2014). Troubles with dialogic teaching. *Learning, Culture and Social Interaction*, *3*(4), 274-285. https://doi.org/10.1016/j.lcsi.2014.04.001

Sedova, K., Sedlacek, M., & Svaricek, R. (2016). Teacher professional development as a means of transforming student classroom talk. *Teaching and Teacher Education*, *57*, 14-25. https://doi.org/10.1016/j.tate.2016.03.005

Seeland, K., Dübendorfer, S., & Hansmann, R. (2009). Making friends in Zurich's urban forests and parks: The role of public green space for social inclusion of youths from different cultures. *Forest Policy and Economics*, *11*(1), 10-17. https://doi.org/10.1016/j.forpol.2008.07.005

Simpson, A. (2016). Dialogic teaching in the initial teacher education classroom: 'Everyone's voice will be heard. *Research Papers in Education*, *31*(1), 89-106. https://doi.org/10.1080/02671522.2016.1106697

Tienda, M. (2013). Diversity≠ Inclusion: Promoting integration in higher education. *Educational Researcher*, *42*(9), 467-475. https://doi.org/10.3102/0013189X13516164

Vass, E. (2018). Building dialogic spaces through inclusive conversations. In W. Sawyer, G. Munns, K. Zammit, C. Attard, E. Vass, & C. Hatton (Eds.), *Engaging schooling: Developing exemplary education for students in poverty* (pp. 101-119). https://doi.org/10.4324/9781315561905-14

Vázquez, O. (2001). Inmigrantes en la escuela: Un espacio para la cooperación. *Comunicar*, *16*, 73-78. https://doi.org/10.3916/C16-2001-11

Viana, C. (2020). *Empatia na escola? Aqui, o que conta não é estar certo ou errado*. Público. https://bit.ly/2Zz1Lug

Wegerif, R. (2010). Dialogue and teaching thinking with technology: opening, expanding, and deepening the 'inter-face. In K. Littleton, & C. Howe (Eds.), *Educational dialogues: Understanding and promoting productive interaction* (pp. 304-322). Routledge. https://doi.org/10.4324/9780203863510

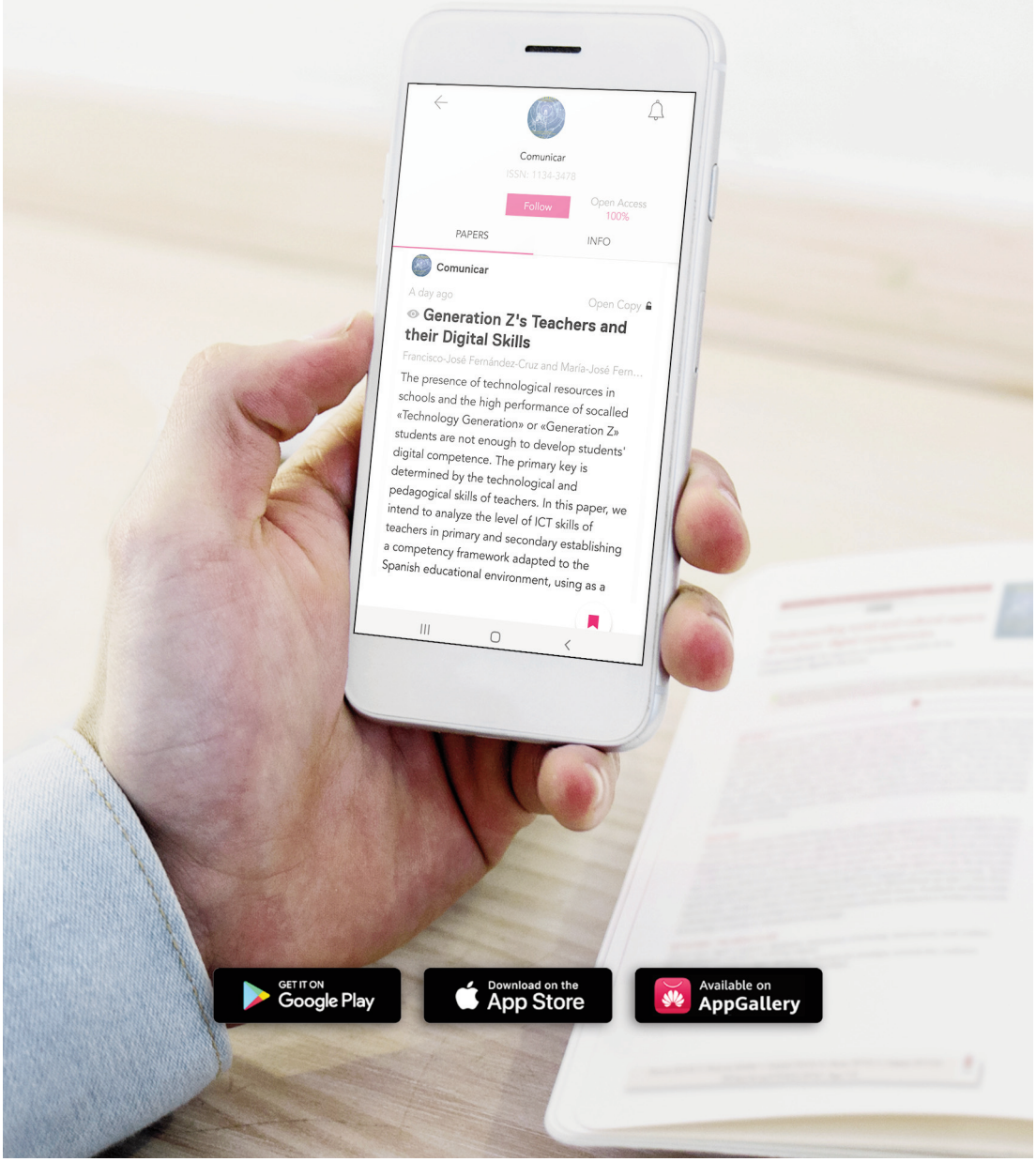
Wilkinson, I.A.G., Reznitskaya, A., Bourdage, K., Oyler, J., Glina, M., Drewry, R., Kim, M.Y., & Nelson, K. (2017). Toward a more dialogic pedagogy: Changing teachers' beliefs and practices through professional development in language arts classrooms. *Language and Education*, *31*(1), 65-82. https://doi.org/10.1080/09500782.2016.1230129

Woodcock, S., & Woolfson, L.M. (2019). Are leaders leading the way with inclusion? Teachers' perceptions of systemic support and barriers towards inclusion. *International Journal of Educational Research*, *93*, 232-242. https://doi.org/10.1016/j.ijer.2018.11.004

Wright, N., & Stickley, T. (2013). Concepts of social inclusion, exclusion and mental health: A review of the international literature. *Journal of Psychiatric and Mental Health Nursing*, *20*(1), 71-81. https://doi.org/10.1111/j.1365-2850.2012.01889.x

Comunicar

Follow us in Researcher



GET IT ON Google Play

Download on the App Store

Available on AppGallery

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

STEAM projects with KIKS format for developing key competences

Proyectos STEAM con formato KIKS para el desarrollo de competencias clave

Dr. José-Manuel Diego-Mantecón. Associate Professor, Department of Mathematics, Statistics and Computing, University of Cantabria (Spain) (josemanuel.diego@unican.es) (https://orcid.org/0000-0002-4427-2724)
Dr. Teresa-F. Blanco. Professor, Applied Didactics Department, University of Santiago de Compostela (Spain) (teref.blanco@usc.es) (https://orcid.org/0000-0003-4215-8677)
Zaira Ortiz-Laso. Predoctoral Fellow, Department of Mathematics, Statistics and Computing, University of Cantabria (Spain) (zaira.ortiz@unican.es) (https://orcid.org/0000-0001-9629-2279)
Dr. Zsolt Lavicza. Full Professor, STEM Education Center, Johannes Kepler University, Linz (Austria) (zsolt.lavicza@jku.at) (https://orcid.org/0000-0002-3701-5068)

ABSTRACT

Secondary education curricula highlight competence-based learning; although meaningful school-intervention habits have not yet been observed. The initiatives implemented have focused primarily on promoting the combined development of no more than three key competences. This article presents an international study under the Erasmus+ and H2020 programmes, for analysing the impact of the STEAM project-based learning approach with KIKS format (Kids Inspire Kids for STEAM) on the interwoven development of key competences. The sample included 267 high school students divided into 53 teams from 29 educational centres in Finland, England, Hungary, and Spain. Each team carried out several projects for no less than two academic years, by means of the following two approaches: STEAM project-based learning and KIKS. Data were collected from observations and interviews with students, teachers, and KIKS trainers. Analyses revealed that the combination of these two approaches facilitate the development of all eight key competences. The project-based learning focus essentially fostered the enhancement of the mathematical competence and in science, technology, and engineering, while KIKS format promoted literacy and multilingual competences. The remaining competences were encouraged by the combination of both approaches. It is noteworthy that prolonged participation in the programme, as it was implemented, was crucial to achieving the obtained outcomes.

RESUMEN

Los currículos de educación secundaria resaltan el aprendizaje por competencias, aunque actualmente no se observan cambios sustanciales en los hábitos de intervención en el aula. Las iniciativas implementadas se han centrado principalmente en impulsar el desarrollo conjunto de tres competencias clave como máximo. Este artículo presenta un estudio internacional bajo los programas Erasmus+ y H2020, con el objetivo de establecer relaciones entre el aprendizaje basado en proyectos STEAM con formato KIKS (Kids Inspire Kids for STEAM) y el desarrollo global de las competencias clave. La muestra incluye 267 estudiantes de secundaria distribuidos en 53 equipos de 29 centros de Finlandia, Inglaterra, Hungría y España. Cada equipo elaboró varios proyectos durante al menos dos años académicos con los siguientes enfoques de implementación: aprendizaje basado en proyectos STEAM y KIKS. Los datos se recabaron por medio de observaciones y entrevistas a estudiantes, profesores y formadores KIKS. Los análisis revelaron que la combinación de ambos enfoques facilita el desarrollo de las ocho competencias clave. El aprendizaje por proyectos favoreció esencialmente la competencia matemática y en ciencia, tecnología e ingeniería, mientras que el formato KIKS potenció las competencias en lectoescritura y multilingüe. El resto se vieron estimuladas por la combinación de ambos enfoques. Cabe destacar que la participación prolongada en el programa de implementación fue determinante en los resultados obtenidos.

KEYWORDS | PALABRAS CLAVE

Competence, project-based learning, STEAM, KIKS format, secondary education, internationalization.
Competencia, aprendizaje basado en proyectos, STEAM, formato KIKS, educación secundaria, internacionalización.

Received: 2020-05-29 | Reviewed: 2020-06-05 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-03 | Pages: 33-42

1. Introduction and state of the question

Following a series of recommendations from Europe, current study plans emphasise the importance of acquiring and developing key competences (Consejo de la Unión Europea, 2018). Developing these competences has fomented the use of active methodologies as a way to guarantee a lifelong formation of citizens (López-Pastor, 2011; Paños-Castro, 2017). In secondary school classrooms, however, no meaningful changes have been observed in the intervention processes, or in the application of such methodologies (Valverde-Crespo et al., 2018). The factors that impede the development of competences include teacher resistance to change (Al-Salami et al., 2017; Monereo, 2010), and challenges inherent to implementing active methodologies (Vázquez-Cano, 2016). In addition, the excessive dependence on textbooks in countries like Spain does not promote the improvement of these competences (Toma & Greca, 2018).

One of the methodologies most often utilised to work on key competences is the STEM project-based learning. This methodology integrates the content of STEM subjects (Science, Technology, Engineering, and Mathematics) (Han et al., 2015) to form competent citizens capable of confronting the challenges of modern society (Acar et al., 2018; Maass et al., 2019), by narrowing the gap between the competences acquired under a traditional focus and those demanded by current professional contexts (Jang, 2016; Ward et al., 2014). STEM project-based learning centres primarily on fomenting the scientific-mathematical competence; this competence is often complemented with the digital one by integrating the search for information and the use of software into problem-solving activities (Domènech-Casal, 2018; Valverde-Crespo et al., 2018). There are various studies at the level of primary education that integrate the development of several competences using active methodologies (Martín & García, 2018). For secondary education, however, very few projects have been implemented to work on three or more competences conjointly. That is, no attempts have been made to undertake the integral development of all eight key competences in this educational stage.

Considering this background, in this article we present a three-year investigation in which 267 secondary school students from four countries developed the eight key competences globally, by elaborating projects under a STEAM project-based learning approach with KIKS format. The STEAM focus incorporates the A of Arts to integrate subjects from the areas of Humanities and Art with the scientific disciplines previously mentioned (Colucci-Gray et al., 2019). The acronym KIKS means Kids Inspire Kids for STEAM. The present international study is framed in the European Erasmus+ and H2020 programmes.

1.1. Key competences

Key competences are defined as a combination of knowledge, skills, and attitudes. Knowledge is made up of facts, concepts, and theories; skills include the ability to apply knowledge and obtain results, while attitudes refer to an individual's willingness to act in certain situations (Consejo de la Unión Europea, 2018). From a curricular perspective, learning by competences presupposes "a rupture with the traditional structure of academic disciplines and a commitment to an interdisciplinary approach in the teaching-learning process" (García-Raga & López-Martín, 2011: 537). After evaluating various recommendations, the Council of the European Union identified eight key competences: 1) literacy; 2) multilingual; 3) mathematical competence and competence in science, technology, and engineering; 4) digital; 5) personal, social, and learning-to-learn; 6) citizenship; 7) entrepreneurship; and (8) cultural awareness and expression.

Literacy competence is the ability to understand, express, and interpret information both oral and written, while multilingualism is related to fluency in one or more foreign languages. Mathematical competence and competence in science, technology, and engineering include the ability to formulate, apply, and interpret mathematics in daily life problems, as well as the ability to explain the natural world, propose questions, and extract conclusions. Digital competence involves various abilities such as utilising technologies safely and responsibly. Citizenship competence emphasises the capacity to participate fully in social and civic life, whereas personal, social and learning-to-learn competence comprises the capacity of managing time and learning both autonomously and collaboratively. Entrepreneurship competence

relates to the ability to transform opportunities and ideas into acts, while cultural awareness and expression competence includes the capacity to understand and respect different cultural and artistic contexts.

Most European study plans have come to echo these competences with the goal of achieving lifelong learning and preparing citizens to confront the professional needs of modern society (Nordin & Sundberg, 2016). The development of competences has been propelled through various initiatives, including digital resources, citizen science, and reading clubs, as well as environmental and heritage contexts. Castillo (2008) and Valverde-Crespo et al. (2018) highlight, for example, the use of digital resources for developing mathematical competence and competence in science, technology and engineering. Digital resources have also been employed to foster ethical decision-making (Pérez-Escoda et al., 2014; Wesselink & Giaffredo, 2015), and to potentiate literacy (Marchal et al., 2018) and multilingual competences (Jalkanen & Vaarala, 2013) by videoconferencing (Tecedor & Campos-Dintrans, 2019) and listening to news in non-maternal languages (González-Villarón & Egido-Gálvez, 2017).

Education for sustainable development and environmental education have been presented as initiatives to motivate the learning of values and promote social and environmental justice (Agirreazkuenaga, 2020). Likewise, heritage and artistic education are used as resources that contribute to forming critical and reflexive citizens (Trabajo-Rite & Cuenca-López, 2020). Citizen science experiments, based on processes of co-creation, are employed to raise students' awareness of social needs and concerns (Senabre et al., 2018). Reading clubs stimulate several components of literacy competence, such as reading comprehension and literary judgement (Álvarez-Álvarez & Vejo-Saiz, 2017), whereas working in everyday contexts has been suggested as an effective instrument for enhancing students' critical faculties and fostering cooperation among peers (Santisteban, 2009). As deduced from the above, diverse initiatives and resources exist to work on key competences. Nevertheless, in terms of methodology, STEM project-based learning is the most often used approach to develop such competences (Domènech-Casal et al., 2019; Han et al., 2015).

1.2. STEM project-based learning

STEM project-based learning includes the typical features of the interdisciplinary approach (Slough & Milam, 2013), where teamwork and context play a fundamental role (Kennedy & Odell, 2014). The projects implemented are normally open-ended, unstructured in nature, leading themselves to processes of scientific search within a practical framework of design (Ayerbe-López & Perales-Palacios, 2020; Diego-Mantecón et al., 2019). The usual result of applying this methodology is a final product that puts into practice knowledge and skills from different subjects (Fuentes-Hurtado & González-Martínez, 2017). In recent years, the 'A' of Arts has been incorporated into STEM education, so the acronym was modified to STEAM. As a consequence, this approach includes developing projects that involve, in addition to scientific-technological disciplines, subjects in the Humanities, Social Sciences, and Art (Colucci-Gray et al., 2019).

Although STEAM practices are increasing, most research related to project-based learning and competence development is conducted through the earlier STEM approach. Normally, investigations analyse different dimensions of mathematical competence and competence in science, technology, and engineering. Afriana et al. (2016), for example, showed school students in Indonesia significantly improved their scientific competence, compared to a control group, after participating in a STEM programme.

Likewise, Acar et al. (2018) detected significantly higher grades in the area of sciences in a group of Turkish students. In a three-year longitudinal study of secondary students in the United States, Han et al. (2016) observed a marked enhancement in the development of mathematical skills in the fields of geometry and probability. In their work, Diego-Mantecón et al. (2019) obtained similar results with Spanish students after a two-year intervention, while in a shorter programme Sarican and Akgunduz (2018) detected a relation between STEM projects and scientific competence, though their analyses did not generate significant differences. Relations between other competences and STEM project-based learning have rarely been confirmed, although some authors suggest that this methodology promotes the personal, social, and learning-to-learn competence (Sarican & Akgunduz, 2018; Larmer et al., 2015), as well as literacy and multilingual competences (Viro & Joutsenlahti, 2018). To work on key competences globally,

instead of individually, European initiatives like KIKS and STEMforYouth propose using a STEAM project-based learning approach with KIKS format (Blanco et al., 2019).

1.3. STEAM projects with KIKS format

STEAM project-based learning with KIKS format follows a well-defined elaboration process. All projects are undertaken in a non-maternal language, usually English, aiming to motivate others, who are not present, to learn STEAM subjects (Blanco et al., 2019). Students are active agents who carry out projects collaboratively under the supervision of teachers or educators in relevant areas. The latter are usually passive agents whose role is to provide support for students' decision-making. Projects are introduced when teachers pose the following challenge: how can we get other students interested in STEAM subjects? With this challenge student choose, under teachers' supervision, the project to be carried out. This may emerge from an idea expressed by the participants themselves or from a repository of activities designed by experts. Projects can vary in their complexity and duration according to participants' availability. Having settled on a project, participants proceed to outline, sequence, and distribute tasks. All team members collaborate in every stage of the project, from the initial proposal through the processes of investigation and experimentation, reaching agreement on solutions, solving problems, and designing the final product or conclusions. As part of the work, students must prepare a textual report and a video (Blanco et al., 2019). The report has to include a project description, its development, and the final result, with a strong focus on analytical aspects, while the video has to demonstrate the practical aspects, such as assembling materials, constructing artefacts, and describing their functioning or applicability. All students must also participate in presenting their work in videoconferences and face-to-face encounters at national and international events. During the exhibition period, teams can incorporate changes and improvements in their STEAM projects to adapt their presentations to different audiences.

A thorough literature review did not identify any research evaluating the influence of STEAM project-based learning on the enhancement of competences from a global perspective. The objective of our work, therefore, is to analyse the extent to which STEAM project-based learning with the KIKS format contributes to the integrated development of key competences. In line with this, we address the following question: to what extent is there a relationship between the implementation of STEAM projects with the KIKS format and the development of the eight key competences?

2. Materials and methods

To answer the research question, a battery of high school STEAM projects was designed alongside an implementation guide. The projects were devised by adapting Thibaut et al.'s (2018a; 2018b) framework which includes five dimensions: 1) integration of STEAM content; 2) problem-centred learning; 3) inquiry-based learning; 4) design-based learning; and 5) cooperative learning. The projects included content from at least two STEAM disciplines and were set in a problem-solving context that leads to a phase of investigation and design process, through a cooperative learning approach. These were implemented considering the features of the KIKS format (Blanco et al., 2019), so for each project, the students were asked to generate a text document in two languages and produce a video in their non-maternal language. Another requirement was to disseminate their results, both virtually and in person, through videoconferences, as well as national and international events. This action entailed an iterative process of enhancing their work as they were receiving feedback.

This investigation was conducted in the educational innovation context of the KIKS project, under the umbrella of the Erasmus+ programme, with continuity in Spain through the STEMforYouth project (H2020). Each partner called for the participation of high schools in their respective country (Finland, England, Spain, Hungary), in the regions of Jyväskylä, Cambridgeshire and Cantabria, and the city of Budapest (part of Buda). Schools were contacted via e-mail through the councils of education. We received responses from at least 30 educational centres in each country, some public others non-public. Teachers at those centres were invited to participate in the first phase of the programme, which comprised theoretical sessions on STEAM education, KIKS format, and key competences implications in study plans. After those sessions, teachers participated in various training workshops about the classroom

implementation of STEAM projects with KIKS format. Most of these teachers completed training, but 77% refused to take part in the implementation phase. Their refusals were attributed to such obstacles as rigid class schedules, incompatibility with evaluation procedures, lack of support in their centres, and low self-confidence due to a lack of interdisciplinary knowledge.

As a result, the final sample of this study consisted of a total of 46 teachers and 267 students, at 29 secondary schools in the four countries, nobody had prior experience in implementing project-based learning in their classrooms. 53 student teams were formed, each with 4-6 members, depending on the project scope and complexity. The teams were supervised by at least one teacher from the STEAM areas and a KIKS trainer, researcher who acts as advisor during the project development; a total of 17 KIKS trainers joined the study. The study lasted three school years, with students beginning at the age of 13-14. Each team carried out at least three projects during school hours, within a minimum of two academic years. The projects were presented at educational congresses for teachers and researchers, school events for students, and science outreach activities for the general public. Online conferences were also organised by teams in different countries. Detailed information on the projects and events is found in the following repositories: https://bit.ly/KIKSWEB, and https://bit.ly/STEM4Yweb.

For data analysis, a qualitative approach was adopted because the research question sought to identify relations between STEAM project-based learning with the KIKS format and global development of key competences. In no case was the intention of the study to generalize results or validate cause-effect relationships among variables; rather, the goal was to deepen analyses in an exploratory manner by identifying possible relations between variables (Creswell, 2009), in this case between the STEAM-KIKS approach and the eight key competences. A quadrangular focus was employed to examine and contrast the data obtained from the semi-structured interviews held with teachers, students and KIKS trainers, and the observations made along the implementation process of the programme. Data were gathered before, during and after carrying out the projects, and the presentations at events. These observations and interviews allowed obtaining specific information on the factors that influenced the development of competences. Most of the information was compiled in video form for later analysis. Analyses were conducted to identify relations between the variables. For each competence, tables were employed to compile and cross-reference data from the interviews and observations. Once the data were cross-referenced, relations between the variables were established, extracting testimonies to support the outcomes. Table 1 synthesises, as an example, the guide utilised to analyse digital competence. The left column presents the question matrix applied to orient the interviews; the second and fourth columns show the characteristics of STEAM project-based learning approach and KIKS format, respectively. Finally, columns three and five provide gaps for researchers' comments on the knowledge, skill, or attitude promoted by the programme.

Table 1. Guide for interviews and observations (digital competence)

Questions posed to teachers, students and KIKS trainers	STEAM project-based learning	Knowledge, skill, or attitude identified	KIKS format	Knowledge, skill, or attitude identified
What aspects of the programme contribute to the development of digital competence?	Integration of content		Preparing written documents in two languages	
	Problem-solving in context		Creating and editing videos in a non-maternal language	
	Inquiry-based learning		Videoconferencing in two languages	
	Design-based learning		Face-to-face presentations in two languages to different audiences	
	Cooperative learning		Improving projects through an iterative process	

3. Analysis and results

The data analysis from the observations and interviews with students, teachers, and trainers allowed examining in detail the relation between STEAM project-based learning with the KIKS format and the development of the eight key competences.

3.1. Multilingual and literacy competence

The students from all four countries showed improvement in several components of linguistic competence in both their maternal language and a foreign language. They enhanced their oral expression as a result of the presentations prepared to disseminate their work. Pablo (Spanish teacher aged 38) expressed the following: "After various works, my students succeeded in making more organised presentations, explaining the steps followed in their projects clearly". Almost all the teachers and KIKS trainers coincided in observing that after the first year, the students improved their vocabulary and pronunciation in the non-maternal language. Balazs (Hungarian teacher aged 43) stated: "My students did not have fluent English, but after various videoconferences with foreign students they were able to make themselves better understood". Students also learned to adapt their discourse to different audiences when making presentations at educational congresses and outreach events. Mary (English trainer aged 35) affirmed that: "The students enhanced their oral and corporal expression, increasingly emphasising the important aspects of their projects. […] They looked at the audience and gesticulated to draw their attention". All these aspects facilitated interaction and dialogue with the attendees and the reception of feedback to amend their work. Ulla (Finnish student aged 15) indicated: "We really improved our presentations after visualising the videos with our teacher. It was a challenge for us not to repeat information".

3.2. Mathematical competence and competence in science, technology and engineering

The students enhanced this competence by solving projects in real contexts that integrated content typically studied separately in the classroom. They also started to become aware of the applicability of the content learnt at school, an advance that helped them understand the importance of learning such content. Tony (English student aged 14) said: "I never knew maths had such an important role. It was necessary to use maths in almost all the projects". Óscar (Spanish teacher aged 45) expressed the following: "My students learned that solving a real problem requires dividing it into parts, and applying content of various areas of knowledge". The projects entailed managing mathematical properties, and scientific and technological content. During their development, it became clear that several students had never assimilated some contents taught in regular lessons. Mirka (Finnish teacher aged 38) commented: "When we first proposed the projects, the students didn't realize they had to utilise content already studied". Zsolt (Hungarian student aged 17) indicated: "With the projects I was able to understand the laws of physics that I'd studied in previous courses and that I had never really understood". Nicolás (Spanish student aged 16) revealed: "I didn't understand what the drawings we made in technology lessons were good for, until I designed prototypes of the robot".

3.3. Digital competence

The students developed several aspects of digital competence, after being involved in the implementation of projects for several years. They utilised resources like computers, tablets, and mobile phones to look up information and prepare their presentations. The students also improved their abilities in taping and editing the videos produced for disseminating the results. Francisco (Spanish KIKS trainer aged 53) commented: "They used technological resources more and more; they even generated graphs to clearly display the information". Peter (English teacher aged 45) observed: "Some students voluntarily redid the video to improve its quality after looking into more sophisticated editing techniques". Digital media, like Twitter or Skype, served to facilitate communications among team members and to present their advances to third parties. In this regard, Celia (Spanish student aged 15) expressed: "Many of the doubts or suggestions we made to the teacher were sent by Twitter". Another benefit of their growing digital competence was that the students learned to operate free programmes for data-handling and dynamic geometry, such as Tracker and GeoGebra, respectively. Anne (English student aged 15), for example, declared: "I never thought GeoGebra could help me solve real problems. My maths teacher only used it to teach us functions".

3.4. Personal, social, learning-to-learn competence, and entrepreneurial competence

The personal, social and learning-to-learn, as well as the entrepreneurial competences were also strengthened during the programme immersion. Students contributed with creative ideas and made decisions on how to focus their work, and how deeply they should delve into the topic. The teachers acted as supervisors, but their participation usually remained secondary, especially when the teams had to develop strategies to confront specific tasks. Vilmos (Hungarian teacher aged 58) revealed: "In the first project, the students had difficulty in planning the work, and felt they were being forced to give ideas and arguments about the steps to follow". In this vein, Elisabeth (English teacher aged 41) commented: "I noticed improvement with respect to the work plan. [...] The students divided the work up among themselves, and I felt it was unnecessary to intervene". Other areas where improvement was observed were sharing presentation times, and the coordination of the team members. The students gained greater self-confidence as they advanced in the projects and came to see themselves as protagonists of their learning process, becoming able to assess their own progress. Matt (English KIKS trainer aged 59), for example, made this comment: "At the final events, the students divided the presentation time more equitably. At first, some refused to intervene and others went on too long".

3.5. Citizenship competence, and cultural awareness and expression competence

These two competences were promoted throughout the three-year programme. Several teams carried out projects in which the Arts and the cultural expressions were fundamental pillars. The project entitled 'Half-pointed Arches', for instance, included efforts to learn and incorporate, architectural, heritage, and artistic aspects, in addition to their work on the mathematical, technological, and engineering elements. The objective of the project 'Can Recycling' was not only to integrate content, but also to exploit artistic representations as a way to raise citizens' awareness of the importance of recycling. Other projects that stressed social sensitivity were 'Microorganisms in Everyday Objects', 'A Drop of Life', and 'Accessibility Ramps'. The students involved in the latter project consulted legislative documents to verify the suitability of ramps in their surroundings, using mathematical concepts and digital devices. This project also turned out to be an experience in citizen awareness for people with reduced mobility. Markku (Finnish student aged 15) commented: "After the videoconference, whenever I saw a ramp in my city, I asked myself if it was really practical for people in wheelchairs". The multicultural context in which the programme was developed was also enriching, as it offered opportunities to observe social, artistic, and cultural aspects of other societies. Lucía (Spanish student aged 14) added: "The Finns' presentation on 'Himmeli' [a typical Christmas object in that country] made me realise that these artistic figures are indeed sold in Spain". In both the virtual and face-to-face encounters, students manifested interest in the ideas and cultural aspects of others. Regarding the latter, for example, they emphasised the patrimonial and cultural knowledge acquired on the national and international trips.

4. Discussion and conclusions

The present study identified the relations between STEAM project-based learning with the KIKS format and the global development of the eight key competences. Our results concur with those of Han et al. (2015, 2016), Acar et al. (2018), Afriana et al. (2016), and Diego-Mantecón et al. (2019) in the sense that STEM practices contribute to developing mathematical competence and competence in science, technology and engineering. This study also reveals that the KIKS format makes it possible to work on, and strengthen, the other key competences. We were able to verify, for example, that carrying out STEAM projects in a foreign language promotes the multilingual competence. In contrast to traditional learning, the KIKS format not only demands students reading and writing in a language different from their mother tongue, but also fosters communication through exchanges of information in both virtual and face-to-face settings. These conclusions coincide with those obtained in studies of learning non-maternal languages by reaffirming that digital devices, videoconferences, and listening to native speakers all enhance multilingual competences (Jalkanen & Vaarala, 2013; Tecedor & Campos-Dintrans, 2019; González-Villarón & Egido-Gálvez, 2017). The KIKS format also supports literacy competence, when the students present their work at local events in their own language; a notion already defended by Viro and Joutsenlahti (2018).

The feature of the KIKS approach that urges students to generate written documents and videos has been shown to be effective in the development of the digital competence. This competence is further strengthened by the use of digital resources to look up information, design prototypes, and collect and analyse data. In this study, digital competence was not developed as an end in itself but, rather, as a natural medium through which projects could be generated due to its close linkage to the other key competences. Valverde-Crespo et al. (2018) underscored this conclusion when they argued that digital competence is an element of scientific competence. Years earlier, researchers had established other, similar, relations like those that exist between 'digital competence' and 'personal, social and learning-to-learn competence' (Wesselink & Giaffredo, 2015), as well as between the digital and the multilingual competences (Jalkanen & Vaarala, 2013).

Right from the project selection, the connection with KIKS format and project-based learning manifested the development of the personal, social and learning-to-learn competence and the entrepreneurial competence. The projects were chosen in accordance with students' interests, and in consensus with their teacher. Also, each student collaborated in every project stage, from the problem approach to the final presentation. The development of these two competences was enhanced by allowing the students to lead their own projects, plan the tasks, and find the most adequate sequence for performing them, as well as improving their work by analysing the feedback received during their presentations. It is noteworthy that the relation between carrying out STEM projects, 'entrepreneurial spirit' and 'critical thinking' had already been suggested, though not confirmed, by Sarican and Akgunduz (2018) and Larmer et al. (2015).

Although project-based learning is often implemented under a STEM framework (Domènech-Casal et al., 2019; Han et al., 2015, 2016) and certain reticence to use the STEAM focus still persists, the present study shows that the 'A' of Arts does indeed provide an extra dimension; one that fosters, among other aspects, the cultural awareness and expression competence. Our study reveals that apart from enhancing the scientific-mathematical and technological competence, it also develops aspects related to architectural, heritage, and artistic knowledge. The KIKS requirement of attending national and international events also aided in the development of citizenship competence, by allowing visits to different artistic and cultural settings and promoting interaction with people there. In this programme, various students participated, for example, in educational congresses in England, Spain, or Italy. Regarding citizenship competence, the topic of some projects raised both authors' and receivers' awareness of environmental and health practices.

The partial and global analyses of this study revealed that the improvement of the competences was produced as a consequence, not only of the approaches applied, but also of students' long-term participation in the programme (minimum two years). The iterative process of preparing and refining – essential characteristic of the KIKS format– required extra effort from the students to correct and enhance their projects during an ongoing period of evaluation and supervision. All our analyses indicate that the enhancement of competences was generated primarily in the second year. These conclusions concur with the results from Sarican and Akgunduz (2018) in suggesting that intensive STEM practices utilised during brief time periods rarely succeed in promoting competence development. More studies, however, are needed to bolster the consistency of these results.

It is important to emphasise that in addition to the benefits shown during the programme implementation, the observations identified barriers that suppose challenges for existing educational systems. Project-based learning with the KIKS format is not easily adapted to the fixed lesson scheduling of educational centres, nor are their methods of evaluation; these facts constituted obstacles to several teachers who initially showed interest in joining the programme. Workspaces like workshops, laboratories, and computer rooms are essential for implementing this programme, but are not always available in schools, or are inadequate. Since this instruction format requires fungible materials, technological components beyond those in common use, and attendance at educational events, a regulated institutional framework would be needed to provide supplementary human resources and financial support. We can also affirm that two of the main reasons why teachers refused to participate were a lack of training on the interdisciplinary focus, and inadequate support from other agents at their centres.

To further develop this line of research, quantitative investigations would be useful to analyse the relations identified in this study and to cross-reference the categorical variables not addressed herein,

included gender, educational centres' characteristics, and socio-economic contexts. This future study would provide greater consistency to the results obtained to date and shed additional light on the nature and development of these eight key competences.

Funding Agency

This study has received support from: The European Union's Horizon 2020 Research and Innovation Programme (710577); the Erasmus+ Programme (2015-1-HU01-KA201-013611); and the FEDER/Ministerio de Ciencia, Innovación y Universidades – Agencia Estatal de Investigación (EDU2017-84979-R).

References

Acar, D., Tertemiz, N., & Ta demir, A. (2018). The effects of STEM training on the academic achievement of 4th graders in science and mathematics and their views on STEM training. *International Electronic Journal of Elementary Education*, *10*(4), 505-513. https://doi.org/10.26822/iejee.2018438141

Afriana, J., Permanasari, A., & Fitriani, A. (2016). Project based learning integrated to stem to enhance elementary school's students scientific literacy. *Jurnal Pendidikan IPA Indonesia*, *5*(2), 261-267. https://doi.org/10.21831/jipi.v2i2.8561

Agirreazkuenaga, L. (2020). Education for Agenda 2030: What direction do we want to take going forward? *Sustainability*, *12*, 2035-2035. https://doi.org/10.3390/su12052035

Al-Salami, M.K., Makela, C.J., & Miranda, M.A. (2017). Assessing changes in teachers' attitudes toward interdisciplinary STEM teaching. *International Journal of Technology and Design Education*, *27*(1), 63-88. https://doi.org/10.1007/s10798-015-9341-0

Álvarez Álvarez, C., & Vejo-Sainz, R. (2017). Mejora de la competencia lectora con un club de lectura escolar. *Biblios*, *68*, 110-122. https://doi.org/10.5195/BIBLIOS.2017.351

Ayerbe-López, J., & Perales-Palacios, F.J. (2020). 'Reinventa tu ciudad': Aprendizaje basado en proyectos para la mejora de la conciencia ambiental en estudiantes de Secundaria. *Enseñanza de las Ciencias*, *38*, 181-203. https://doi.org/10.5565/rev/ensciencias.2812

Blanco, T.F., Ortiz-Laso, Z., & Diego-Mantecón, J.M. (2019). Proyectos STEAM con formato KIKS para la adquisición de competencias LOMCE. In J. M. Marbán, M. Arce, A. Maroto, J. M. Muñoz-Escolano, & A. Alsina (Eds.), *Investigación en Educación Matemática XXIII* (pp. 614-614). SEIEM. https://bit.ly/3iLCrZj

Castillo, S. (2008). Propuesta pedagógica basada en el constructivismo para el uso óptimo de las TIC en la enseñanza y el aprendizaje de la matemática. *Revista Latinoamericana de Investigación en Matemática Educativa*, *11*(2), 171-194. https://bit.ly/3iLCrZj

Castro, J.P. (2017). Educación emprendedora y metodologías activas para su fomento. *Revista Electrónica Interuniversitaria de Formación del Profesorado*, *20*(3), 33-33. https://doi.org/10.6018/reifop.20.3.272221

Colucci-Gray, L., Burnard, P., Gray, D., & Cooke, C. (2019). A Critical Review of STEAM (Science, Technology, Engineering, Arts, and Mathematics). In P. Thomson (Ed.), *Oxford Research Encyclopedia of Education* (pp. 1-26). Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.398

Consejo de la Unión Europea (Ed.) (2018). *Recomendación del consejo de 22 de mayo de 2018 relativa a las competencias clave para el aprendizaje permanente*. Diario Oficial de la Unión Europea. https://bit.ly/3epV571

Creswell, J.W. (2009). Research design: Quantitative, qualitative and mixed methods approaches. Sage.

Diego-Mantecón, J.M., Arcera, O., Blanco, T.F., & Lavicza, Z. (2019). An engineering technology problem-solving approach for modifying student mathematics-related beliefs: Building a robot to solve a Rubik's cube. *International Journal for Technology in Mathematics Education*, *26*(2), 55-64. https://doi.org/10.1564/tme_v26.2.02

Domènech-Casal, J. (2018). Concepciones de alumnado de secundaria sobre energía: una experiencia de aprendizaje basado en proyectos con globos aerostáticos. *Enseñanza de las Ciencias*, *36*, 191-213. https://doi.org/10.5565/rev/ensciencias.2462

Domènech-Casal, J., Lope, S., & Mora, L. (2019). Qué proyectos STEM diseña y qué dificultades expresa el profesorado de secundaria sobre Aprendizaje Basado en Proyectos. *Revista Eureka sobre Enseñanza y Divulgación de las Ciencias*, *16*. https://doi.org/10.25267/Rev_Eureka_ensen_divulg_cienc.2019.v16.i2.2203

Fuentes-Hurtado, M., & González-Martínez, J. (2017). Necesidades formativas del profesorado de Secundaria para la implementación de experiencias gamificadas en STEM. *Revista de Educación a Distancia*, *54*, 1-25. https://doi.org/10.6018/red/54/8

García-Raga, L., & López-Martín, R. (2011). Convivir en la escuela. Una propuesta para su aprendizaje por competencias. *Revista de Educación*, *356*, 531-555. https://doi.org/10.4438/1988-592X-RE-2011-356-050

Han, S., Capraro, R., & Capraro, M.M. (2015). How science, technology, engineering, and mathematics (STEM) project-based learning (PBL) affects high, middle, and low achievers differently: The impact of student factors on achievement. *International Journal of Science and Mathematics Education*, *13*(5), 1089-1113. https://doi.org/10.1007/s10763-014-9526-0

Han, S., Rosli, R., Capraro, M.M., & Capraro, R.M. (2016). The Effect of Science, Technology, Engineering and Mathematics (STEM) Project Based Learning (PBL) on students' achievement in four Mathematics topics. *Journal of Turkish Science Education*, *13*, 3-29. https://doi.org/10.12973/tused.10168a

Jalkanen, J., & Vaarala, H. (2013). Digital texts for learning Finnish: Shared resources and emerging practices. *Language Learning and Technology*, *17*(1), 107-124. https://doi.org/10125/24512

Jang, H. (2016). Identifying 21st century STEM competencies using workplace data. *Journal of Science Education and Technology*, *25*(2), 284-301. https://doi.org/10.1007/s10956-015-9593-1

Kennedy, T.J., & Odell, M.R.L. (2014). Engaging students in STEM education. *Science Education International*, *25*(3), 246-258. https://bit.ly/2CnOZ8q
Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project based learning*. ASCD.
López, F.M.M., Romero, C.S., & Martín-Cuadrado, A.M. (2018). Análisis de la competencia lingüística en primaria a través de las TIC. *Pixel-Bit*, *53*(53), 123-135. https://doi.org/10.12795/pixelbit.2018.i53.08
López-Pastor, V.M. (2011). El papel de la evaluación formativa en la evaluación por competencias: Aportaciones de la red de evaluación formativa y compartida en docencia universitaria. *REDU*, *9*(1), 159-159. https://doi.org/10.4995/redu.2011.6185
Maass, K., Geiger, V., Ariza, M.R., & Goos, M. (2019). The role of mathematics in interdisciplinary STEM education. *ZDM*, *51*, 869-884. https://doi.org/10.1007/s11858-019-01100-5
Martín, D., & García, M.G. (2018). Transformación del modelo educativo en el aprendizaje y desarrollo competencial. Estudio de caso. *Bordón*, *70*(4), 103-119. https://doi.org/10.13042/Bordon.2018.60992
Monereo, C. (2010). ¡Saquen el libro de texto! Resistencia, obstáculos y alternativas en la formación de los docentes para el cambio educativo. *Revista de Educación*, *352*, 583-597. https://bit.ly/3gWCHmP
Nordin, A., & Sundberg, D. (2016). Travelling concepts in national curriculum policy-making: The example of competencies. *European Educational Research Journal*, *15*(3), 314-328. https://doi.org/10.1177/1474904116641697
Pérez-Escoda, A., Castro-Zubizarreta, A., & Fandos-Igado, M. (2016). La competencia digital de la Generación Z: claves para su introducción curricular en la Educación Primaria. [Digital skills in the Z Generation: Key questions for a curricular introduction in primary school]. *Comunicar*, *49*, 71-79. https://doi.org/10.3916/C49-2016-07
Santisteban, A. (2009). Cómo trabajar en clase la competencia social y ciudadana. *Aula de Innovación Educativa*, *187*, 12-15. https://bit.ly/3fh1X6t
Sarican, G., & Akgunduz, D. (2018). The impact of integrated STEM education on academic achievement, reflective thinking skills towards problem solving and permanence in learning in science education. *Cypriot Journal of Educational Sciences*, *13*(1), 94-107. https://doi.org/10.18844/cjes.v13i1.3352
Senabre, E., Ferran-Ferrer, N., & Perelló, J. (2018). Diseño participativo de experimentos de ciencia ciudadana. [Participatory design of citizen science experiments]. *Comunicar*, *54*, 29-38. https://doi.org/10.3916/C54-2018-03
Slough, S.W., & Milam, J.O. (2013). Theoretical framework for the design of STEM project-based learning. In R. M. Capraro, M. M. Capraro, & J. M. Morgan (Eds.), *STEM Project-Based Learning: An Integrated Science, Technology, Engineering, and Mathematics Approach* (pp. 15-27). Sense Publishers. https://doi.org/10.1007/978-94-6209-143-6_3
Tecedor, M., & Campos-Dintrans, G. (2019). Developing oral communication in Spanish lower-level courses: The case of voice recording and videoconferencing activities. *ReCALL*, *31*(2), 116-134. https://doi.org/10.1017/s0958344018000083
Thibaut, L., Ceuppens, S., Loof, H.D., Meester, J.D., Goovaerts, L., Struyf, A., de Pauw, J.B., Dehaene, W., Deprez, J., Cock, M.D., Hellinckx, L., Knipprath, H., Langie, G., Struyven, K., de Velde, D.V., Petegem, P.V., & Depaepe, F. (2018). Integrated STEM education: A systematic review of instructional practices in secondary education. *European Journal of STEM Education*, *3*(1), 1-2. https://doi.org/10.20897/ejsteme/85525
Thibaut, L., Knipprath, H., Dehaene, W., & Depaepe, F. (2018). The influence of teachers' attitudes and school context on instructional practices in integrated STEM education. *Teaching and Teacher Education*, *71*, 190-205. https://doi.org/10.1016/j.tate.2017.12.014
Toma, R.B., & Greca, I.M. (2018). The effect of integrative STEM instruction on elementary students' attitudes toward science. *EURASIA Journal of Mathematics, Science and Technology Education*, *14*(4), 1383-1395. https://doi.org/10.29333/ejmste/83676
Trabajo-Rite, M., & Cuenca-López, J.M. (2020). Student Concepts after a didactic experiment in heritage education. *Sustainability*, *12*(7), 3046-3046. https://doi.org/10.3390/su12073046
Valverde-Crespo, D., Pro-Bueno, A.J., & González-Sánchez, J. (2018). La competencia informacional-digital en la enseñanza y aprendizaje de las ciencias en la educación secundaria obligatoria actual: una revisión teórica. *Revista Eureka sobre enseñanza y divulgación de las ciencias*, *15*, 1-15. https://doi.org/10.25267/rev_eureka_ensen_divulg_cienc.2018.v15.i2.2105
Vázquez-Cano, E. (2016). Dificultades del profesorado para planificar, coordinar y evaluar competencias claves. Un análisis desde la Inspección de Educación. *Revista Complutense de Educación*, *27*(3), 1061-1083. https://doi.org/10.5209/rev_RCED.2016.v27.n3.47400
Villarón, M.G., & Gálvez, I.E. (2017). Factores explicativos del aprendizaje de la comprensión oral en lengua inglesa en educación secundaria: Comparación entre España y Holanda. *Revista Complutense de Educación*, *28*(2), 591-607. https://doi.org/10.5209/rev_rced.2017.v28.n2.49634
Viro, E., & Joutsenlahti, J. (2018). The start project competition from the perspective of Mathematics and academic literacy. *Education Sciences*, *8*(2), 67-67. https://doi.org/10.3390/educsci8020067
Ward, J.R., Clarke, H.D., & Horton, J.L. (2014). Effects of a research-infused botanical curriculum on undergraduates' content knowledge, STEM competencies, and attitudes toward plant sciences. *CBE—Life Sciences Education*, *13*, 387-396. https://doi.org/10.1187/cbe.13-12-0231
Wesselink, R., & Giaffredo, S. (2015). Competence-based education to develop digital competence. *Encyclopaideia*, *19*(42), 25-42. https://doi.org/10.6092/issn.1825-8670/5537

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Aggressiveness, instability and social-emotional education in an inclusive environment

Agresividad, inestabilidad y educación socioemocional en un entorno inclusivo

Dr. Ana-M. Tur-Porcar. Professor, Department of Basic Psychology, University of Valencia (Spain) (ana.tur@uv.es) (https://orcid.org/0000-0003-4132-7109)
Dr. Anna Llorca-Mestre. Associate Professor, Department of Basic Psychology, University of Valencia (Spain) (anna.llorca@uv.es) (https://orcid.org/0000-0002-0540-7884)
Dr. Vicenta Mestre-Escrivá. Full Professor, Department of Basic Psychology, University of Valencia (Spain) (maria.v.mestre@uv.es) (https://orcid.org/0000-0002-2864-8453)

ABSTRACT
In the context of inclusive schools, social-emotional learning encourages student involvement in classroom life and is related to a decrease in maladaptive behaviour. The objective of this study is to analyse the impact of a social-emotional education program on aggressiveness and emotional instability in childhood. Participants were 555 children aged 7 to 12 years (M=9.2 and SD=1.5), 55.5% boys and 45.5% girls. The children were students of primary education at six public schools in Valencia (Spain). The sample was distributed into an experimental group (317 children; 57.2% of the total participating population) and a control group (238 children). The teachers of the experimental group received training to implement the program in class. The teachers of the control group received no training and did not apply the program. The results in the pre-test and posttest phases in both groups are analysed. In the pretest phase, significant differences appeared between the groups: the experimental group showed higher levels of aggressiveness and emotional instability than the control group. In the post-test phase, aggressiveness and emotional instability decreased significantly in the experimental group (medium-high effect size), whilst aggressiveness and emotional instability increased in the control group. The effects of the program on the students are discussed further.

RESUMEN
En el marco de la escuela inclusiva, el aprendizaje socioemocional y personalizado fomenta la implicación del alumnado en la vida del aula y se relaciona con la disminución de la conducta desadaptativa. El objetivo de este estudio es analizar el impacto de un programa de educación socioemocional en la agresividad y la inestabilidad emocional en la infancia. Han participado 555 niños/as de 7 a 12 años (M=9,2 y DT=1,5), 55,5% niños y 45,5% niñas. Estudian Educación Primaria en seis colegios públicos del área metropolitana de Valencia (España). La muestra se ha distribuido en un grupo experimental (317 niños/as; 57,2% de la población total participante) y un grupo control (238 niños/as; 42,8% del total). El profesorado del grupo experimental recibió formación para implementar el programa en clase. El profesorado del grupo control no recibió formación ni aplicó el programa. Se analizan los resultados en la fase pretest y postest en ambos grupos. En la fase pretest, aparecen diferencias significativas entre los dos grupos: el grupo experimental muestra niveles más altos en agresividad e inestabilidad emocional que el grupo control. En la fase postest bajan significativamente la agresividad y la inestabilidad emocional en el grupo experimental, con un tamaño del efecto medio-alto; mientras que en el grupo control suben la agresividad y la inestabilidad emocional. Se discuten los efectos del programa en el alumnado.

KEYWORDS | PALABRAS CLAVE
Inclusion, social-emotional learning, aggressiveness, emotional instability, childhood, primary education.
Inclusión, aprendizaje socioemocional, agresividad, inestabilidad emocional, infancia, Educación Primaria.

Received: 2020-05-27 | Reviewed: 2020-05-30 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-04 | Pages: 43-52

1. Introduction and state of the art

There is currently a debate over how to structure education under the principle of inclusiveness and non-exclusivity. This debate seeks to promote personalised education that embraces diversity, respects individuality, and seeks to bring out the cognitive and emotional capabilities of students. For this purpose, it is advisable to create learning processes aimed at fostering the capabilities of each and every student, placing the emphasis on the classroom (Harris, 2011). To this end, efforts are being made to promote conditions where everyone feels involved in learning and co-responsible for the development of their competencies to achieve transformational learning (Carrington & Selva, 2010). Likewise, knowledge of the learning ecology is necessary to encourage students' involvement by promoting autonomy and offering strategies to develop the self-regulation of learning (Coll, 2013; González-Sanmamed et al., 2018; Martínez-Rodríguez & Benítez-Corona, 2020). Thus, the aim is to configure the learning process by involving the processes and contexts that offer learning opportunities and help understand capabilities, needs, motivations, abilities and interests. Social-emotional learning is at the heart of inclusive approaches in basic education. It spans not only cognitive and intellectual aspects but also affective, social and moral elements to equip students with useful attitudes for life (UNESCO, 2013). Social-emotional education programmes work at the individual and group levels in the classroom environment. At the individual level, they increase social skills and assertive conflict resolution skills through direct instruction (Izard, 2002). At the group level, they create safe, affective learning environments through teacher training (Hawkins et al., 2004; Portnow et al., 2018).

Social-emotional education aims to offer students the necessary conditions for them to become engaged in their own teaching and learning process in a cohesive classroom environment. Thus, a learning-friendly classroom environment is the ideal place for children's integral development, where attention is paid to academic, emotional, and social development (De-Pedro et al., 2016). In this context, there is also a need to foster autonomy and communication. The empirical evidence shows that developing autonomy helps students participate in their own learning and become involved in the functional learning process (Díez-Gutiérrez & Díaz-Nafría, 2018). The empirical evidence also shows that the development of social-emotional skills improves the ability to communicate and reason about conflict, encouraging the search for satisfactory solutions to ensure peaceful coexistence (Aber et al., 2003).

A meta-analysis of 213 articles exploring social-emotional intervention programs confirms the improvements in participants' emotional and social skills and attitudes when compared with non-participants. These improvements include positive attitudes towards oneself, others and school in general, as well as fewer behavioural problems and better academic performance (Durlak et al., 2011). The understanding of one's own and others' emotions (Salisch et al., 2013) and the ability to regulate one's own behaviour develop rapidly at an early age (Eisenberg & Sulik, 2012). Therefore, childhood may be the ideal stage to implement these programs to prevent aggressive behaviours from getting engrained and becoming the common way of relating to others. Using aggressiveness as a way of relating to others may be linked to cognitive distortions that lead to the justification of this type of behaviour and to a belief in aggressiveness to maintain one's status within the group (Bandura, 1999).

1.1. Social-emotional learning and behaviour in childhood

Learning processes work through the involvement of physiological, cognitive and emotional mechanisms and the interactions between them as a result of the learning itself (Masten & Cicchetti, 2010). These knowledge transformations have cumulative effects on personal development (Masten et al., 2005) in a dynamic context that acts as a process of developmental change in children (Jones et al., 2010). Some competencies connect with others in the form of knowledge scaffolding, multiplying learning (Cicchetti & Gunnar, 2008) such that knowledge attracts knowledge. A school concerned with student involvement in the learning process tends to increase new learning and curb the development of disruptive and aggressive behaviours (Masten & Cicchetti, 2010). Accordingly, social-emotional learning has been positively linked to academic success (McCormack et al., 2014; Durlak et al., 2011) and the promotion of positive personal adjustment mechanisms (Weissberg et al., 2003). Social-emotional learning has also been negatively linked to aggressive behaviour (Lösel & Beelman, 2003; Wilson & Lipsey, 2007) and other behavioural problems,

such as school dropout, crime and substance use (Wilson et al., 2001). Aggressive behaviour is connected to a lack of emotional control (Eisenberg & Sulik, 2012).

Likewise, disciplinary problems in the educational environment and feelings of peer rejection or lack of acceptance negatively affect academic performance (Arens et al., 2015; Schenke et al., 2015). In both scenarios, negative learning situations arise for those who experience them. Aggression and violence can affect children's mental health and place children at risk of experiencing emotional adjustment problems in adolescence (Farrington, 2005). In addition, violent children display deficiencies of self-control and emotional instability (Berger, 2007; Mestre et al., 2010) and are more likely to be impulsive and to fail to show empathy for the victims of their aggression (Olweus, 1991). The close link between aggressiveness and emotional instability has been confirmed, such that these two variables reinforce one another and lead to personal and social vulnerability (Mestre et al., 2010; Palmen et al., 2011).

1.2. The elements and the programme of emotional learning

Social-emotional learning has positive effects on core executive functions such as planning and inhibitory control, which are characteristics of high cognitive ability, by creating calm, predictable classroom environments for students (Raver et al., 2011). This is linked to the regulation of the prefrontal areas of the cerebral cortex (Greenberg, 2006). Moreover, learning occurs through interactions with the ecological environment, so it must cover the ability to resolve conflicts and problems of coexistence through students' responsibility and autonomy. Thus, the teaching and learning process must cover the conceptual aspects that are typical of traditional learning, as well as emotional and motivational elements of students, in coordination with teachers. Schools must therefore adapt to the needs of students to create an inclusive environment aimed at responding to diversity and fostering education for all (Ainscow et al., 2006). To this end, it is important to establish communication channels amongst teachers, between teachers and students, and between families and the educational community. Students who perceive good relations at school tend to perform better (Cerdá et al., 2019).

From this perspective, a programme was designed for social-emotional intervention as a classroom resource consisting of 16 two-hour sessions (Mestre et al., 2011). The programme included interconnected cognitive, affective and behavioural competencies that are considered important for autonomy and success at school: i) emotional self-awareness (recognition of one's own and others' emotions, values, strengths, weaknesses, and self-esteem), ii) emotional self-control (emotional and behavioural regulation and relaxation), iii) communication and social skills (social skills, assertiveness, and expressing praise and complaints to establish healthy relationships), iv) social awareness (empathy and perspective-taking, prosocial behaviour, active listening, and listening to the feelings of others), and v) conflict resolution and decision making (analysing possible conflictive situations of classroom life and reaching responsible conclusions, decision making, agreements, and follow-up of agreements) (Taylor et al., 2017). The programme covers knowledge of one's own emotions and those of others, emotional self-control, personal autonomy, self-regulation and the ability to resolve conflicts in coexistence (Mestre et al., 2011). The programme was applied at school by teachers, who received 24 one-hour training sessions. Here, we present the effects of the programme on aggressiveness and emotional instability in childhood.

1.3. Aims and hypotheses

The aim of this study is to analyse the effects of a childhood emotional education programme (described in the previous section) and to observe the effects on students' aggressive behaviour and emotional instability (Kokko et al., 2006; Mestre et al., 2010). To this end, comparative analyses are carried out between the experimental and control groups. The following hypotheses are formulated:

1) We expect that, in doing the selection of the sample in the initial situation (pretest phase) significant differences do not appear between the experimental and control groups in the variables of aggressiveness and emotional instability. Therefore, we expect both groups to be in a similar situation in terms of their conflictive level at the start of the programme.

2) We expect the application of the programme to help reduce aggressiveness and emotional instability in childhood.

2. Materials and methods

2.1. Participants

Participants were 555 children (55.5% boys and 44.5% girls) aged 7 to 12 years (M=9.2 and SD=1.5). All were students of primary education. The age distribution was as follows: 7 years (11.8%), 8 years (20.9%), 9 years (16.6%), 10 years (21.5%), 11 years (19.3%) and 12 years (9.9%).

Most children were Spanish (85.3%). The other children were from Eastern Europe (5.8%), Arab countries (4.0%), Latin America (4.2%), Western Europe (0.5%) and Sub-Saharan Africa (0.2%).

With regard to family structure, most families were two-parent families (75%). The remaining 25% of students were from single-parent families due to separation or divorce (22%) or death (3%).

The sample was divided into two groups: an experimental group and a control group. The condition for being part of the experimental group was that the teachers agreed to carry out the emotional education programme and participate in the related training sessions prior to and during the project. The teachers had to implement the programme for all students in the class, so all the students in the classroom had to participate.

The experimental group consisted of 317 children aged 7 to 12 years (57.2% of participants; 31% boys and 26.2% girls). The mean age was 9.2 years (SD = 1.6). The age distribution was as follows: 7 years (6.8%), 8 years (14%), 9 years (9.1%), 10 years (10.5%), 11 years (10.7%) and 12 years (6.1%).

In relation to cultural and geographical origin, most were from Spanish families (47.5%). The remaining participants were from Eastern Europe (4%), Latin America (2.4%), Arab countries (2.6%), Western Europe (0.5%) and Sub-Saharan Africa (0.2%).

Regarding family structure, most participants were from two-parent families (44.5%), with 12.7% from single-parent families.

The control group consisted of 238 children (42.8% of the total sample). Of this percentage, 24.5% were boys and 18.3% were girls. Therefore, both groups had similar proportions of the analysed categories. The ages also ranged between 7 and 12 years (M = 9.4 and SD = 1.4). The age distribution was as follows: 7 years (5%), 8 years (6.9%), 9 years (7.5%), 10 years (11%), 11 years (8.6%) and 12 years (3.8%).

In terms of origin, 37.8% were from Spanish families, 1.8% from Eastern Europe, 1.8% from Latin America and 1.4% from Arab countries. Regarding family structure, 30.5% were from two-parent families, and 12.3% were from single-parent families.

2.2. Procedure

The programme was presented to public schools in the metropolitan area of Valencia (Spain) through the Valencian Centres for Training, Innovation and Educational Resources (CEFIRES). Implementation of the programme required teachers to work on the programme with their group of students. After this initial contact, teachers agreed to participate in six schools with similar characteristics: they offered primary education, were publicly run and were located on the outskirts of the city.

The project had four phases: a) training of teachers in the experimental group (10 hours before the programme and 14 one-hour training sessions to monitor the programme). The teachers of the control group received no training and followed the curriculum in the traditional way; b) before the programme, initial evaluation of the aggressiveness and emotional instability of students in the experimental and control groups was performed (pretest phase); c) the intervention phase of the programme for the experimental group; d) post-test phase for the experimental and control groups, using the same psychological constructs as in the pre-test phase.

Training for teachers in the experimental groups took place in the schools with the full group of teachers. The aim was to create a space for training and debate so that teachers would feel involved and would present the content of the activities with their student groups. Reflecting on teaching and sharing experiences in a friendly environment reassures teachers and has positive effects on teaching (Gómez-Zepeda et al., 2017). The involvement of teachers can have positive effects on reducing the aggressiveness and impulsiveness of student behaviour (Malti et al., 2011). The programme also received the support of the Valencian regional government and the consent of the families. The ethical standards

set by the APA were followed, respecting the voluntary nature of the study, confidentiality, and anonymity. The evaluation before and after the intervention programme took place in the classroom. The data were analysed using SPSS version 24.0.

2.3. Instruments

Physical and Verbal Aggression Scale (Caprara & Pastorelli, 1993; Spanish adaptation Del Barrio et al., 2001). This scale has 15 items aimed at evaluating behaviours related to hurting others, both physically and verbally. The response format consists of three alternatives (often, sometimes, never) to indicate the frequency of the behaviour described in each item. Example items: "I kick and punch" and "I badmouth my classmates". The reliability analysis shows that Cronbach's alpha is .85 for the total sample. Cronbach's alpha is .84 for the experimental group and .85 for the control group.

Emotional Instability Scale (Caprara & Pastorelli, 1993; Spanish adaptation Del Barrio et al., 2001). Items describe behaviour in relation to a lack of self-control in social situations as a result of the lack of ability to curb impulsiveness and emotionality. The scale has 15 items with three response alternatives (often, sometimes, never). Example items: "I'm in a bad mood" or "I interrupt others whilst they're talking". Cronbach's alpha is .80 for the total sample. Cronbach's alpha is .80 for the experimental group and .79 for the control group.

2.4. Data analysis

The Kolmogorov-Smirnov test of normality to determine the goodness-of-fit of two probability distributions to one another suggested that the analysis should be performed using non-parametric tests. Thus, the Mann–Whitney U test (1947) was carried out to test the equivalence of two groups (control and experimental), accompanied by analysis of effect size using Cliff's Delta (Cliff, 1993). The Wilcoxon sign test was also applied to related samples evaluated at two different times (pre-test – post-test), with the corresponding analysis of effect size using the PS_{dep} (Grissom & Kim, 2012). This analysis was performed for the whole participating population, differentiating between the control group and the experimental group to ascertain the initial conditions of the two groups, as well as the degree of similarity between them.

To this end, for the experimental group, the differences between two moments in time, before and after the intervention (pre-test and post-test phases), were analysed. The same was done for the control group (pre-test and post-test phases) to verify the results for the experimental group and the control group. The aim of this step was to analyse the effect of the intervention programme on aggressiveness and emotional instability in childhood.

3. Results

First, the Mann–Whitney U test was performed to compare the scores for the control and experimental groups.

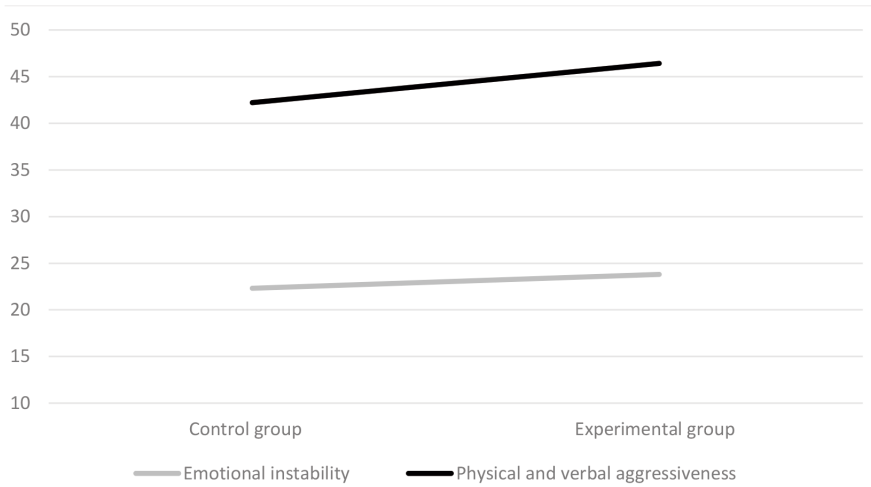
In the pre-test phase, the results indicate that there are significant differences in aggressiveness and emotional instability between the two groups. Specifically, the experimental group has higher scores of emotional instability and aggressiveness than the control group. In these cases, the effect size is small (Cliff's Delta: emotional instability=.151; physical and verbal aggressiveness=.227) (Table 1) (Cohen, 1988).

Table 1. Comparative analyses of the control and experimental groups in the pretest phase

	Experimental group		Control group		Z	Bilateral asymptotic significance	Cliff's Delta
	M	SD	M	SD			
Emotional instability	23.8	5.4	22.3	4.5	-2.478	.013	.151
Physical and verbal aggressiveness	22.6	6.4	19.9	3.9	-3.716	.000	.227

It is observed that in the initial situation of both groups, there were significant differences in emotional instability and physical and verbal aggressiveness. However, the experimental group had higher scores of aggressiveness and emotional instability (Table 1; Figure 1).

Figure 1. Comparative analyses of the control and experimental groups in the pre-test phase



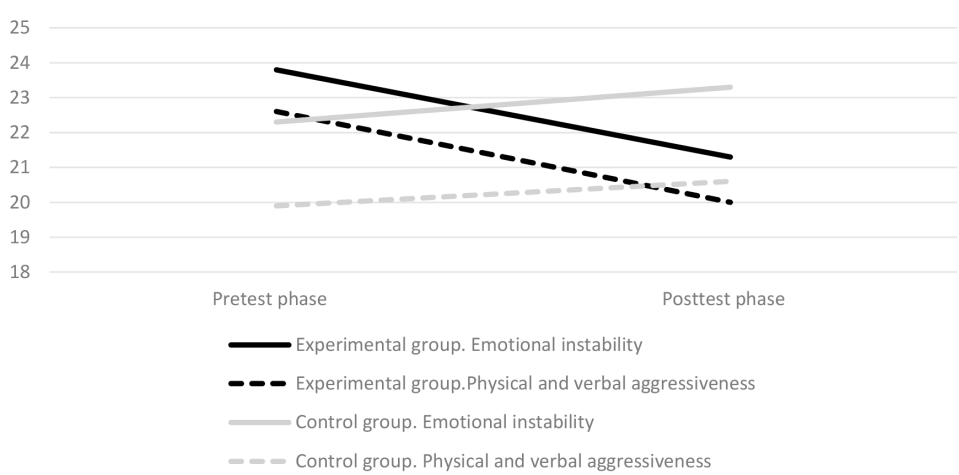
The results of the Wilcoxon signed-rank test (WSRT) for the experimental group and the control group are now presented separately.

Table 2. Comparative analyses of the experimental group in the pre-test and post-test phases

	Pre-test phase		Post-test phase		Z	Bilateral asymptotic significance	PS_{dep} (Grissom & Kim)
	M	SD	M	SD			
Emotional instability	23.8	5.4	21.3	4.2	-9.069	.000	.626
Physical and verbal aggressiveness	22.6	6.4	20.0	4.2	-8.128	.000	.578

Table 2 shows the results for the experimental group in the pre-test and post-test phases. Significant differences between the pre-test and post-test scores may be observed for emotional instability and physical and verbal aggression. The results show that after the application of the programme, emotional instability and aggressiveness were significantly lower (Figure 2). The effect size according to the PS_{dep} test of Grisson and Kim is in the medium-to-large range (.626 and .578) (Cohen, 1988).

Figure 2. Comparative analyses in the pretest and posttest phases



The situation is different for the control group. The results show that there are no significant differences between the pre-test and post-test phases in physical and verbal aggressiveness (Table 3; Figure 2). However, there are significant differences in emotional instability. The emotional instability scores reported by the children increased over time. That is, the scores in the post-test phase are higher (pre-test:

M=22.3 and SD=4.5; post-test: M=23.3 and SD=4.5; p=.015). In this case, the effect size is medium (Cohen, 1988).

Table 3. Comparative analyses of the control group in the pretest and posttest phases

	Pretest phase		Posttest phase		Z	Bilateral asymptotic significance	PS_{dep} (Grissom & Kim)
	M	SD	M	SD			
Emotional instability	22.3	4.5	23.3	4.5	-2.427	.015	.464
Physical and verbal aggressiveness	19.9	3.9	20.6	5.7	-.652	.514	--

4. Discussion and conclusions

The aim of this research is to analyse the impact of a classroom-based social-emotional education programme and its effects on aggressiveness and emotional instability in childhood. This social-emotional intervention programme aims at teaching emotional awareness (emotional knowledge, expression and self-regulation) and self-control, with an emphasis on responsibility, autonomy, self-concept and self-motivation, as well as empathy and moral values. The goal is to promote effective problem coping strategies to solve problems in a responsible and effective way.

In general, the results show the effectiveness of applying the programme, by confirming a decrease in the aggressiveness and emotional instability of the experimental group as a whole. Social-emotional learning is based on the knowledge of teachers about their students. This knowledge on the part of teachers lays the foundations to offer students personalised learning through reflection upon their own and others' emotions, self-regulation and self-control, providing understandable learning scenarios so that students can deal with them responsibly and autonomously. This helps achieve one of the indicators for global education monitoring –that of learning to be and learning to live together– through the education involving affective, social and moral factors, advocated by UNESCO (2013).

To form the control and experimental groups, similarity in terms of gender, age, level of studies and the conditions of the boys and girls was taken into account, although the class teacher had to agree to teach the programme for the class to be included in the experimental group. However, the initial situation (pre-test phase) of the experimental and control groups was not the same. As observed, the two groups had significant differences in aggressiveness and emotional instability in the pre-test phase. We face the paradox that the experimental group had higher rates of aggressiveness and emotional instability than the control group in the pre-test phase. Therefore, the first hypothesis, regarding similar conditions in the control and experimental groups, could not be fully tested. As shown in the Results section, the experimental group, as a whole, displayed higher scores in terms of aggressiveness and emotional instability.

However, after the implementation of the programme, both aggressiveness and emotional instability in the experimental group decreased significantly, and both variables increased slightly in the control group such that significant differences in emotional instability were observed. Thus, the second hypothesis, which posited a decrease in aggressiveness and emotional instability in the experimental group after the application of the programme, is confirmed. As shown, the emotional education programme contributed to achieving a significant decrease in aggressiveness and emotional instability in childhood. The two variables are closely related, as shown by previous research (Mestre et al., 2010; Palmen et al., 2011).

The results provide three conclusions. First, one of the strongest complaints amongst teachers concerns the high rates of aggressiveness amongst schoolchildren. This study shows that emotional education contributes to reducing aggressiveness, given that students are better prepared to use solution strategies that are distinct from mere aggression (Aber et al., 2003). An educational environment that is concerned with fostering the co-responsibility of students, promoting alternatives and skills to tackle the resolution of problems autonomously and responsibly, whilst respecting everybody's interests, provides a dynamic, non-aggressive environment with smooth communication and a concern for learning (González-Sanmamed et al., 2018).

Second, in line with previous research, we observe that aggressiveness and emotional instability are related to one another and feed off each other (Mestre et al., 2010; Palmen et al., 2011). Both variables induce personal vulnerability by being linked to social isolation and the inability to establish lasting positive relationships with peers (Palmen et al., 2011). The social-emotional education programme develops the

necessary emotional competencies aimed at building emotional awareness and self-control, as well as social awareness and responsible, autonomous conflict resolution, seeking the benefit of all (Taylor et al., 2017). These scenarios develop co-responsibility and the ability to deal with tasks autonomously.

Third, it is confirmed that concern for teacher training and the creation of a space for teachers to voice their concerns and speak about classroom conflicts creates a calm environment that has a bearing on individual well-being. Students who perceive smooth relationships between different teachers, as well as between teachers and other groups in the educational setting (e.g. the students and their families), are more likely to feel that they belong at school and to become involved in school and classroom life, which tends to improve their co-existence, as well as their performance (Cerdá et al., 2019).

In short, it may be concluded that education policies and teachers should be sensitive to applying social-emotional education programmes (Jones et al., 2010) and that education authorities should provide teachers with the means to implement these social-emotional education programmes in the formal educational environment.

This study has several limitations. The first limitation refers to the distribution of the control and experimental groups, which was based on the fact that the teachers accepted the implementation of the programme in the classroom, attended the training course and agreed to put it into practice in the classroom. This principle may be a limitation in itself because the teachers who are willing to be involved in the programme, may have different interests and motivations from the teachers in the control group. The teachers in the control group only participated in the evaluation of students in the pre-test and post-test phase. In the future, studies could be designed to distribute the experimental and control groups randomly. This could give a more complete picture of the scope of the intervention and the implementation of the programme with a perspective towards generalisation. A second limitation relates to the fact that the evaluation in the pre-test and post-test phases was based on self-reports. The children completed questionnaires that constituted the variables under analysis. It is plausible that the results could be strengthened by using several sources of information or longitudinal sources, which would have enabled analysis of different moments in the development of the same population.

In terms of future lines of research, in reference to the analyses that were conducted, which focused on groups of children, they could also be conducted with moderating variables, to help observe the subgroups that benefit most from the application of the programme. Seemingly, children who show the greatest aggressiveness at the beginning of the application of social-emotional programmes tend to benefit most from these interventions (Bierman et al., 2010).

With regard to the environment where the programme was implemented, the study was applied in the school context. In future research, this could be complemented by the family environment. The involvement of families in the process of schooling children in coordination with schools has positive effects on children's development. Although the involvement of teachers in programmes to reduce impulsiveness and aggressive behaviour seems to be more effective than that of families (Malti et al., 2011), it cannot be ignored that, together, families and teachers can enhance these effects.

Funding Agency

This study received support from the "Generalitat Valenciana" under the project "PROMETEO 2011/009" and from the "Universidad de Valencia" under the project "UV-INV-AE11-42278".

References

Aber, J.L., Brown, J.L., & Jones, S.M. (2003). Developmental trajectories toward violence in middle childhood: Course, demographic differences, and response to school-based intervention. *Developmental Psychology*, *39*(2), 324-348. https://doi.org/10.1037/0012-1649.39.2.324

Ainscow, M., Booth, T., & Dyson, A. (2006). *Improving Schools, Developing Inclusion*. Routledge. https://doi.org/10.4324/9780203967157

Arens, A.K., Morin, A.J., & Watermann, R. (2015). Relations between classroom disciplinary problems and student motivation: Achievement as a potential mediator? *Learning and Instruction*, *39*, 184-193. https://doi.org/10.1016/j.learninstruc.2015.07.001

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Personality and Social Psychology Review*, *3*(3), 193-209. https://doi.org/10.1207/s15327957pspr0303_3

Berger, K.S. (2007). Update on bullying at school: Science forgotten? *Developmental Review*, *27*(1), 90-126. https://doi.org/10.1016/j.dr.2006.08.002

Bierman, K.L., Domitrovich, C.E., Nix, R.L., Gest, S.D., Welsh, J.A., Greenberg, M.T., Blair, C., Nelson, K.E., & Gill, S. (2008). Promoting academic and social-emotional school readiness: The Head Start Program. *Child Development*, *79*(6), 1802-1817. https://doi.org/10.1111/j.1467-8624.2008.01227.x

Caprara, G.V., & Pastorelli, C. (1993). Early emotional instability, prosocial behaviour, and aggression: Some methodological aspects. *European Journal of Personality*, *7*(1), 19-36. https://doi.org/10.1002/per.2410070103

Carrington, S., & Selva, G. (2010). Critical social theory and transformative learning: evidence in pre-service teachers' service-learning reflection logs. *Higher Education Research & Development*, *29*, 45-57. https://doi.org/10.1080/07294360903421384

Cerda, G., Pérez, C., Elipe, P., Casas, J.A., & Rey, R.D. (2019). Convivencia escolar y su relación con el rendimiento académico en alumnado de Educación Primaria. *Revista de Psicodidáctica*, *24*(1), 46-52. https://doi.org/10.1016/j.psicod.2018.05.001

Cicchetti, D., & Gunnar, M.R. (2008). Integrating biological measures into the design and evaluation of preventive interventions. *Development and Psychopathology*, *20*(3), 737-743. https://doi.org/10.1017/s0954579408000357

Cliff, N. (1993). Dominance statistics: Ordinal analyses to answer ordinal questions. *Psychological Bulletin*, *114*(3), 494-509. https://doi.org/10.1037/0033-2909.114.3.494

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge. https://doi.org/10.4324/9780203771587

Coll, C. (2013). El currículo escolar en el marco de la nueva ecología del aprendizaje. *Aula de Innovación Educativa*, *219*, 31-36. http://bit.ly/38rH6uN

Del-Barrio, M.V., Moreno, C., & López, R. (2001). Evaluación de la agresión e inestabilidad emocional en niños españoles y su relación con la depresión. *Clínica y Salud*, *12*(1), 33-50. http://bit.ly/2ZzZAFy

Díez-Gutiérrez, E.J., & Díaz-Nafría, J.M. (2018). Ecologías de aprendizaje ubicuo para la ciberciudadanía crítica Ubiquitous learning ecologies for a critical cyber-citizenship . *Comunicar*, *54*, 49-58. https://doi.org/10.3916/C54-2018-05

Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., & Schellinger, K.B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405-432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Eisenberg, N., & Sulik, M.J. (2012). Emotion-related self-regulation in children. *Teaching of Psychology*, *39*(1), 77-83. https://doi.org/10.1177/0098628311430172

Farrington, D.P. (2005). Childhood origins of antisocial behavior. *Clinical Psychology & Psychotherapy*, *12*(3), 177-190. https://doi.org/10.1002/cpp.448

Gómez-Zepeda, G., Petreñas, C., Sabando, D., & Puigdellívol, I. (2017). The role of the Support and Attention to Diversity Teacher (SADT) from a community-based perspective: Promoting educational success and educational inclusion for all. *Teaching and Teacher Education*, *64*, 127-138. https://doi.org/10.1016/j.tate.2017.02.002

González-Sanmamed, M., Muñoz-Carril, P.C., & Santos-Caamaño, F.J. (2019). Key components of learning ecologies: A Delphi assessment. *British Journal of Educational Technology*, *50*(4), 1639-1655. https://doi.org/10.1111/bjet.12805

Greenberg, M. (2006). Promoting resilience in children and youth: Preventive interventions and their interface with neuroscience. *Annals of the New York Academy of Sciences*, *1094*(1), 139-150. https://doi.org/10.1196/annals.1376.013

Grissom, R.J., & Kim, J.J. (2012). *Effect sizes for research: Univariate and multivariate applications*. Routledge/Taylor & Francis Group. https://doi.org/10.4324/9780203803233

Harris, A. (2011). System improvement through collective capacity building. *Journal of Educational Administration*, *49*(6), 624-636. https://doi.org/10.1108/09578231111174785

Hawkins, J.D., Smith, B.H., & Catalano, R.F. (2004). Social development and social and emotional learning. In J. Zins, R. Weissberg, M. Wang, & H. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 135-150). Teachers College Press. https://bit.ly/3exljC8

Izard, C.E. (2002). Translating emotion theory and research into preventive interventions. *Psychological Bulletin*, *128*(5), 796-824. https://doi.org/10.1037/0033-2909.128.5.796

Jones, S.M., Brown, J.L., Hoglund, W.L.G., & Aber, J.L. (2010). A school-randomized clinical trial of an integrated social–emotional learning and literacy intervention: Impacts after 1 school year. *Journal of Consulting and Clinical Psychology*, *78*(6), 829-842. https://doi.org/10.1037/a0021383

Kokko, K., Tremblay, R.E., Lacourse, E., Nagin, D.S., & Vitaro, F. (2006). Trajectories of prosocial behavior and physical aggression in middle childhood: Links to adolescent school dropout and physical violence. *Journal of Research on Adolescence*, *16*(3), 403-428. https://doi.org/10.1111/j.1532-7795.2006.00500.x

Lösel, F., & Beelmann, A. (2003). Effects of child skills training in preventing antisocial behavior: A systematic review of randomized evaluations. *The ANNALS of the American Academy of Political and Social Science*, *587*(1), 84-109. https://doi.org/10.1177/0002716202250793

Malti, T., Ribeaud, D., & Eisner, M.P. (2011). The effectiveness of two universal preventive interventions in reducing children's externalizing behavior: A cluster randomized controlled trial. *Journal of Clinical Child & Adolescent Psychology*, *40*(5), 677-692. https://doi.org/10.1080/15374416.2011.597084

Mann, H.B., & Whitney, D.R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *The Annals of Mathematical Statistics*, *18*(1), 50-60. https://doi.org/10.1214/aoms/1177730491

Martínez-Rodríguez, R.C., & Benítez-Corona, L. (2020). La ecología del aprendizaje resiliente en ambientes ubicuos ante situaciones adversas [The ecology of resilience learning in ubiquitous environments to adverse situations]. *Comunicar*, *62*, 43-52. https://doi.org/10.3916/C62-2020-04

Masten, A.S., & Cicchetti, D. (2010). Developmental cascades. *Development and Psychopathology*, *22*(3), 491-495. https://doi.org/10.1017/s0954579410000222

Masten, A.S., Roisman, G.I., Long, J.D., Burt, K.B., Obradovi , J., Riley, J.R., Boelcke-Stennes, K., & Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, *41*(5), 733-746. https://doi.org/10.1037/0012-1649.41.5.733

McCormack, L., Finlayson, O.E., & McCloughlin, T.J. (2014). The CASE Programme Implemented Across the Primary and Secondary School Transition in Ireland. *International Journal of Science Education*, *36*(17), 2892-2917. https://doi.org/10.1080/09500693.2014.938711

Mestre, M.V., Tur, A.M., Samper, P., & Latorre, A. (2010). Inestabilidad emocional y agresividad: Factores predictores. *Ansiedad y Estrés*, *16*, 33-45. http://bit.ly/3dTIVTy

Mestre, M.V., Tur-Porcar, A.M., Samper, P., & Malonda, E. (2011). *Programa de educación de las emociones: La Con-Vivencia*. Tirant lo Blanch Humanidades.

Olweus, D. (1991). Bully/victim problems among schoolchildren: Basic facts and effects of a school based intervention program. In D. J. Pepler, & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 411-448). Lawrence Erlbaum Associates, Inc.

Palmen, H., Vermande, M.M., Dekovi , M., & van Aken, M.A.G. (2011). Competence, problem behavior, and the effects of having no friends, aggressive friends, or non-aggressive friends: A four-year longitudinal study. *Merrill-Palmer Quarterly*, *57*(2), 186-213. https://doi.org/10.1353/mpq.2011.0010

Pedro, K.T.D., Gilreath, T., & Berkowitz, R. (2016). A latent class analysis of school climate among middle and high school students in California public schools. *Children and Youth Services Review*, *63*, 10-15. https://doi.org/10.1016/j.childyouth.2016.01.023

Portnow, S., Downer, J.T., & Brown, J. (2018). Reductions in aggressive behavior within the context of a universal, social emotional learning program: Classroom- and student-level mechanisms. *Journal of School Psychology*, *68*, 38-52. https://doi.org/10.1016/j.jsp.2017.12.004

Raver, C.C., Jones, S.M., Li-Grining, C., Zhai, F., Bub, K., & Pressler, E. (2011). CSRP's impact on low-income preschoolers' preacademic skills: self-regulation as a mediating mechanism. *Child Development*, *82*(1), 362-378. https://doi.org/10.1111/j.1467-8624.2010.01561.x

Schenke, K., Lam, A.C., Conley, A.M., & Karabenick, S.A. (2015). Adolescents' help seeking in mathematics classrooms: Relations between achievement and perceived classroom environmental influences over one school year. *Contemporary Educational Psychology*, *41*, 133-146. https://doi.org/10.1016/j.cedpsych.2015.01.003

Taylor, R.D., Oberle, E., Durlak, J.A., & Weissberg, R.P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*, *88*(4), 1156-1171. https://doi.org/10.1111/cdev.12864

UNESCO (Ed.) (2013). Hacia un aprendizaje universal. Recomendaciones de la Comisión Especial sobre Métricas de los Aprendizajes.

von Salisch, M., Haenel, M., & Freund, P.A. (2013). Emotion understanding and cognitive abilities in young children. *Learning and Individual Differences*, *26*, 15-19. https://doi.org/10.1016/j.lindif.2013.04.001

Weissberg, R.P., Kumpfer, K.L., & Seligman, M.E.P. (2003). Prevention that works for children and youth: An introduction. *American Psychologist*, *58*(6-7), 425-432. https://doi.org/10.1037/0003-066x.58.6-7.425

Wilson, D.B., Gottfredson, D.C., & Najaka, S.S. (2001). School-based prevention of problem behaviors: A meta-analysis. *Journal of Quantitative Criminology*, *17*(3), 247-272. https://doi.org/10.1023/A:1011050217296

Wilson, S.J., & Lipsey, M.W. (2007). School-based interventions for aggressive and disruptive behavior: Update of a meta-analysis. *American Journal of Preventive Medicine*, *33*(2), 130-143. https://doi.org/10.1016/j.amepre.2007.04.011

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

ICT and knowledge management in Teaching and Engineering Students

TIC y gestión del conocimiento en estudiantes de Magisterio e Ingeniería

Elena Ferrero-de-Lucas. Associate Professor, Departament of Education, University of Leon (Spain) (eferd@unileon.es) (https://orcid.org/0000-0003-0785-7114)
Dr. Isabel Cantón-Mayo. Full Professor, Departament of Education, University of Leon (Spain) (icanm@unileon.es) (https://orcid.org/0000-0002-9757-8233)
Dr. Marta Menéndez-Fernández. Assistant Professor, School of Industrial, Computer and Aerospace Engineering, University of Leon (Spain) (mmenf@unileon.es) (https://orcid.org/0000-0001-9020-1743)
Dr. Adrián Escapa-González. Assistant Professor, School of Industrial, Computer and Aerospace Engineering, University of Leon (Spain) (adrian.escapa@unileon.es) (https://orcid.org/0000-0002-5007-349X)
Dr. Antonio Bernardo-Sánchez. Professor, School of Mining Engineering, University of Leon (Spain) (abers@unileon.es) (https://orcid.org/0000-0003-2277-9003)

ABSTRACT

The integration of Knowledge Management (KM) in various fields, including academia and business, has been fostered by the promotion of Information and Communication Technologies (ICTs). The aim of this study was, on the one hand, to understand the key processes of KM in students of the Faculty of Education and the School of Engineering in a Spanish university, and, on the other hand, to evaluate the extent to which ICTs serve as support to these processes. To this end, the designed and validated MAINGC questionnaire was administered to 200 students who entered university in the 2018-2019 academic year. Fourteen ICT tools and four dimensions of KM were analyzed: information management, transformation of information into knowledge, management of the resulting learning, and ICT tools for KM support. The results showed differentiated patterns of technology use and perceptions of KM according to sex, age and degree. Indeed, education degree students reported higher perceptions of competence in KM processes compared to engineering students. Participants' responses regarding ICT tools suggested that the use of these tools has not yet been fully integrated into KM processes and revealed that both groups of students showed different patterns of use within the academic environment.

RESUMEN

La integración de la Gestión del Conocimiento (GC) en diversos ámbitos tanto académicos como empresariales se ha visto favorecida gracias al impulso de las Tecnologías de la Información y la Comunicación (TIC). El objeto de esta investigación ha sido, por un lado, conocer los procesos clave de la GC en estudiantes de la Facultad de Educación y de la Escuela de Ingenierías en una universidad española, y, por otro lado, evaluar en qué medida las TIC sirven como apoyo a estos procesos. Para ello se aplicó el cuestionario diseñado y validado MAINGC a 200 estudiantes que accedieron a la universidad en el curso 2018-2019. Se analizaron catorce herramientas TIC y cuatro dimensiones de GC: gestión de la información, transformación de la información en conocimiento, gestión del aprendizaje resultante y herramientas TIC en apoyo a la GC. Los resultados muestran patrones diferenciados en el uso de la tecnología y de la percepción de la GC en función del género, la edad y la titulación. Así, se observó que los estudiantes de Magisterio se sienten más capacitados que los de Ingeniería en relación con los procesos de GC. Referido al uso de herramientas TIC, las respuestas ofrecidas por los estudiantes encuestados sugieren que su empleo no está todavía totalmente integrado en los procesos de GC y que existen diferencias en los patrones de uso por parte de ambos grupos dentro el entorno académico.

KEYWORDS | PALABRAS CLAVE

ICTs, knowledge management, learning, higher education, innovation, education.
TIC, gestión del conocimiento, aprendizaje, enseñanza superior, innovación, educación.

Received: 2020-03-25 | Reviewed: 2020-04-26 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-05 | Pages: 53-62

1. Introduction

Knowledge Management (KM) emerges as a discipline whose objective is to process knowledge by acquiring, storing, transforming, distributing and using it, in order to achieve competitive advantages (Maravilhas & Martins, 2019). As a strategic asset, the adequate management of knowledge generates advantages and learning in organizations (Valdez et al., 2016).

Although there have been advances in KM in terms of theoretical models on the creation, storage and distribution of knowledge (Nonaka & Takeuchi, 1995; Raisinghani et al., 2016), there is still a deficit of studies aimed at understanding the applicability of KM for the improvement of competitiveness required by society (Rodríguez-Montoya & Zerpa-García, 2019). In reviewing the literature, we gather from Flores-Quispe (2017), that university students identify KM as a powerful tool that enables their understanding of their own learning model and allows them to generate opportunities for interaction and the creation of knowledge exchange networks (cooperative learning) between people and institutions (Abdolvahabi et al., 2014). It also influences their learning success (García-Martín & Cantón, 2019), with KM processes becoming the basis for the integration of various pedagogical and management practices within the university academic environment (Stukalina, 2012).

On the other hand, ICTs are understood as the means to facilitate KM processes in 21st century organizations (Ocaña et al., 2020). They allow the search, creation, storage, communication and distribution of information, implying new modes of work and communication (Cebrián-Cifuentes et al., 2015). Furthermore, they have brought about social, economic and cultural changes (Aguiar et al., 2019). Therefore, understanding the place of technology and KM within an organization is of vital importance, since its effectiveness will depend, among other aspects, on the choice of technological tools, the activity to be carried out, the available resources and the users of ICTs in each organization (Valle-Castañeda et al., 2019).

But how do university students manage knowledge? What tools do they use? How do they perceive technology for their learning? Are there differences between students in the humanities and those in technical careers? Higher Education Institutions (HEIs), mainly public universities, have been forced to adopt models and strategies to improve their quality and competitiveness (Masa'deh et al., 2017). In spite of this, and their role as entities that generate and transmit knowledge (Abu-Naser et al., 2016; Imamura-Díaz et al., 2020), they show a slow development when it comes to valuing and assigning resources to the production of knowledge (Núñez-Guerrero & Rodríguez-Monroy, 2015). The problem is that not all HEIs have achieved levels of excellence in relation to knowledge management, because not all of them manage it correctly (Herrera, 2019). Therefore, universities must take into account, on the one hand, the social responsibility that requires them to engage with external sectors to foster and expand the knowledge produced (Bedoya et al., 2018) and on the other hand, the importance of the social dimension of KM through communities of practice, collaborative learning or organizational culture (Castro et al., 2019). Studies on ICTs and KM show the diverse perceptions of university students on the subject (Henderson et al., 2017; Englund et al., 2017; Enriquez et al., 2019): they generally recognize a positive effect of ICTs on KM, but do not delve into the tools and processes that are most favorable for its application (Araya et al., 2018), which justifies the importance of this study.

Cantón and Ferrero (2016) analyze the processes and components of KM in ICT-supported universities in relation to the study of four key dimensions. First, Information Management with the objective of optimizing the usefulness and contribution of IT resources to achieve organizational objectives; transforming information into knowledge from a personal and social dimension (Choo, 2002). Secondly, in the process of transforming information into knowledge, the student uses cognitive processing strategies (Paredes-Gavilanes et al., 2017), using ICTs that enable the flow, creation, transformation, and dissemination of knowledge (Ahedo-Ruiz & Danvilla, 2014). And thirdly, the resulting learning management where, through various processes (know how), individual and institutional learning is transferred to use and apply previously processed knowledge in lessons learned (Leiva & Astorga, 2014). Finally, ICT tools are fundamental for the effective development of all KM processes (Niebles-Nuñez et al., 2016; Ruggles, 2017), as they improve process management by becoming catalysts for the flow of knowledge as well as important success factors for students (Zabaleta-De-Armas et al., 2016). There is

a need to provide strategies to create more opportunities for the development of digital competence and processes in students (Colás-Bravo et al., 2019).

This review shows the relevance, pertinence and need for studies on the subject (Rodríguez et al., 2019), highlighting the interest of this topic and at the same time revealing gaps in the practical scope of its use, interest and differences between university students. This gap is the one that this research aims to fill by linking KM with its social dimension through Virtual Learning Environments that enable improvement by helping to place knowledge at the disposal of everyone (Liuska-Martinez, 2019).

1.1. Research objectives

In order to determine the starting point and thus try to improve learning processes, the aim is to find out the perception that young higher education students have of KM. On the one hand, it identifies the key processes of KM in universities through the use of ICT tools, and on the other, it seeks to identify differences between two different academic profiles such as Teaching and Engineering students. All this results in two specific objectives:

1) Analyze the patterns of ICT use to support KM processes in students of both degrees.

2) Ascertain whether the fourteen ICT tools, strategies and KM processes differ or are similar in Teaching and Engineering students.

2. Materials and methods

2.1. Sample

The selection of the sample was carried out from two traditionally different branches of knowledge (Letters-Sciences, Teaching and Engineering) that do not include KM as a general competence in their curricula. In the academic year 2018-2019, 200 first-year students were surveyed, 28 men and 72 women in the Primary Education Teaching Degree, and 75 men and 25 women in the Industrial Engineering Degree in the specialties of Electronics and Mechanics (teachers: 1st year n=100; engineers: 1st year n=100). The sampling was intentional to distribute the sample evenly between the Faculty of Education and the School of Industrial, Computer and Aerospace Engineering.

2.2. Research instrument: Foundations and structure

The instrument used is derived from a first pilot study aimed at the construction of the measurement questionnaire. It is related to ICT tools and KM practices and was based on the four dimensions and indicators defined in the Canton and Ferrero study (2016) shown in Table 2. The questionnaire, designated MAINGC, was designed using a Likert scale (1-4) (Table 1: https://doi.org/10.6084/m9.figshare.12653942.v1), and was divided into three parts: the first referred to the personal and academic profile data of students; the second to the frequency of use of fourteen ICT tools that students use in their academic environment; and the last part of the instrument includes 36 items grouped into four blocks that correspond to the four dimensions of KM cited.

Table 2. Dimensions and indicators for the MAINGC questionnaire

Dimensions KM	Processes KM	Items
Information Management	Search, categorization and simplification of information acquired through the use of available information resources.	1-7
Transformation of information into knowledge	Transformation of information into knowledge through different cognitive processing strategies, facilitating storage, structuring and assimilation.	8-17
Management of the resulting learning	Through (know how) processes, individual and organizational learning is transferred to be reused and applied, resulting in lessons learned.	18-27
ICT Tools in Support of KM	Management improvement through knowledge flows and strategies that develop digital competence enabling creation, storage and sharing.	28-36

It was validated by eight university experts (Fox, 1981) using criteria relating to pertinence, univocality and relevance for each item, using as criteria the elimination, permanence or modification in each item of three or more experts. To determine its reliability, the SPSS version 24 statistical package was used. A factorial analysis was performed with the multivariate technique using principal component extraction (PCE). The overall Kaiser-Meyer-Olkin (KMO) measure was 0.867 with individual KMO measures, all values exceeded 0.6, classified according to Kaiser (1974). The data were found to be factorizable, using

the Bartlett sphericity test which was statistically significant (p<.0005). With the resulting items, the internal consistency and reliability of the questionnaire were obtained by means of Cronbach's alpha, obtaining 0.8, which gives it a high internal consistency and high reliability. The statistical analyses were conducted using "R" (R Core Team, 2018), specifically applying the "vcd" and "cluster" packages. Measuring, on the one hand, the degree of association between nominal variables by means of Cramer's V coefficient and, on the other hand, the hierarchical cluster analysis of said variables, where the pairing distances have been calculated by means of the Gower metric (suitable for categorical variables). So, the further away they are from each other within the dendrogram (graphical representation of the analysis), the greater the difference between the two. This enables variables with similar behavior to be grouped together. In order to perform a better data analysis, the different ICT tools present in the study were classified according to their nature (Table 3).

Table 3. Classification of the 14 ICT tools

Communication tools	Institutional email address (IEA)
	Personal email address (PEA)
	Chat (CHT)
	WhatsApp (WAP)
Tools to create and share resources	Weblogs (WLG)
	Wikis (WKS)
	Tutorials (TUT)
	Web platforms (WPT)
	Conceptual maps (CTM)
	Hashtags (HST)
Social Media	Facebook (FBK)
	Twitter (TWT)
	Instagram (ITG)
	YouTube (YTB)

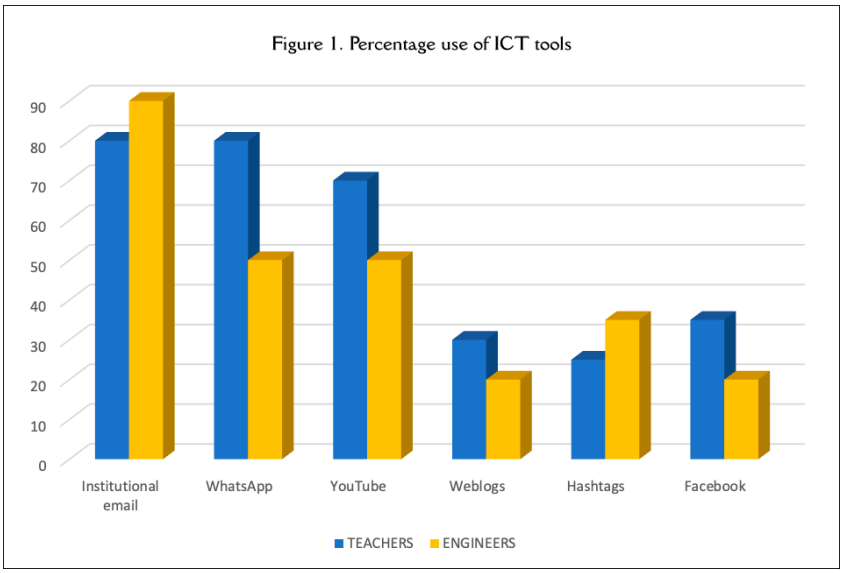
2.3. Procedure

The questionnaire was applied in the first semester from November to January 2018, when the respective university courses began. Student teacher's questionnaires were sent to their institutional e-mails using Google Forms; engineering students were provided with in-person paper-based questionnaires. The reason for the difference was the presence or lack of the faculty participating in the research.

3. Analysis and results

3.1. Descriptive analysis

Firstly, descriptive statistics were analyzed for the variables corresponding to the four dimensions mentioned and the ICT tools. The results show a high level of agreement among students of both degrees in the dimensions involving information management, the transformation of information into knowledge and the management of resulting learning (Figure C1: https://doi.org/10.6084/m9.figshare.12653942.v1); this is evident in the use of knowledge to solve problems (over 88%), knowledge sharing (90%) and the organization of content through the use of ICTs (over 80%). In fact, in the vast majority of items contained in these dimensions (items 1 to 27), the percentage of students who reported they "agree" or " completely agree" exceeded 60% in all cases, standing on average at around 80%. It is also significant that in many of the items included in the fourth dimension (ICT tools in support of KM) this trend is broken, and the sum of students who "agree" or "completely agree" falls to around 40% for both degrees. This is especially true for items 31 to 36, where the degree of proactivity for students in using ICTs in activities related to information management and knowledge transfer is measured.



With regard to ICTs, a first analysis of the results offered in Figure 1 and Figure C2 (https://doi.org/10.6084/m9.figshare.12653942.v1) shows that the most frequent tools used by students in the academic environment are institutional email, WhatsApp and YouTube (more than 50% use them daily). Others such as Weblogs, Hashtags and Facebook are typically less popular with students (less than 35%).

3.2. Analysis of the association of nominal variables with Cramer's V coefficient

In order to systematically identify and quantify these differences (and similarities), Cramer's V was used to measure the strength of the association between nominal variables. These variables are, in this case, the degree of agreement for KM items and the frequency of use for ICTs. In short, Cramer's V offers information on the existence of a correlation (either positive or negative) between the responses offered by students of one degree and another. The results of this analysis are collected in Tables 4, 5 and 6, which include only items and ICTs in which differences between both groups of students were observed with a significance level $p<0.05$.

Table 4. Correlation in relation to academic profiles

	ICT tools	Degree Teaching (T) Engineering (E)	Cramer's V		Items (Table 1)	Cramer's V
ICT use	Institutional email	E	0.265*	Knowledge Management	3	0.245**
					5	0.315*
	Personal email	T	0.206**		6	0.302*
					11	0.280*
	Wikis	E	0.309*		13	0.282*
					15	0.280**
	Tutorials	E	0.275*		16	0.319*
					17	0.370*
	Conceptual maps	T	0.263*		18	0.268*
					23	0.296*
	Hashtag	T	0.259*		24	0.377*
	Facebook	T	0.527*		26	0.264 *
	Twitter	T	0.278*		29	0.293**
	Instagram	T	0.387*		31	0.276*
	YouTube	T	0.238*		34	0.282*

Note. Only those variables with a level of significance are included (**p <0.05; *p<0.01).

Results reveal that, in both degrees, more than 70% of students agreed or strongly agreed with all

the items included in the first dimension (information management). However, it is observed that there are significant differences between the two degrees in terms of student perception in items 3, 5 and 6, with student teachers always offering the most positive responses [e.g. V_{item3}=0.245, p<0.05; V_{item5}=0.315; p<0.01; V_{item6}=0.302; p<0.01].

With regard to the second dimension (transformation of information into knowledge) this turned out to be the most controversial, since a greater number of KM items were detected, where the perception of the students of both degrees differs significantly. Thus, in items 11,13, 15, 16 and 17, student teachers again showed a greater internalization of these processes [e.g. V_{item11}=0.280. p<0.01; V_{item13}=0.282; p<0.01; V_{item15}=0.280; p<0.05; V_{item16}=0.319; p<0.01; V_{item17}=0.370; p<0.01]. As in the previous one, in the third dimension (management of the resulting learning), a considerable number of discrepancies were observed between the two degrees. This is the case of items 18, 23, 24, and 26, which once again positively highlight the perception of student teachers in their responses [ej. V_{item18}=0.268, p<0.01; V_{item23}=0.296; p<0.01; V_{item24}=0.377; p<0.01; V_{item26}=0.264; p<0.01].

As mentioned above, student responses to the fourth dimension (ICT tools in support of KM) showed much lower levels of agreement than those observed in the other dimensions. Significant differences exist in items 29, 31, and 34, where student teachers again clearly showed a higher degree of agreement with the questions posed [e.g. V_{item29}=0.293, p<0.05; V_{item31}=0.276; p<0.01; V_{item34}=0.282; p<0.01]. With regard to the differences in the degree of ICT use, results suggest that the usage pattern of these tools depends significantly on the degree program in which the student is enrolled. Thus, the use of concept maps, Hashtags, Facebook, Twitter, Instagram and YouTube for academic purposes was more frequent among student teachers than among engineering students [e.g. $V_{conceptmaps}$=0.263, p<0.01; $V_{hashtag}$=0.259;p<0.01; $V_{facebook}$=0.527;p<0.01; $V_{twitter}$=0.278,p<0.01; $V_{instagram}$=0.387;p<0.01; $V_{youtube}$=0.238; p<0.01]. In contrast, it was observed that, despite the infrequent use of Wikis and Tutorials in both degrees, engineering students used them most frequently [e.g.V_{wikis}=0.309, p<0.01; $V_{tutorials}$=0.275; p<0.01].

There is a disparity in the use of email, with differences found in both degrees. Indeed, while student teachers make greater use of personal mail [e.g.$V_{persemail}$=0.206, p<0.05], engineering students consult and use institutional email more often [$V_{instemail}$=0.265; p<0.01].

Table 5. Gender Correlation

	Items	Gender	Cramer's V	ICT	Gender	Cramer's V
TEACHERS	4	Female	0.245**	Institutional	Male	0.362 *
	11	Female	0.315**	Email		
ENGINEERS	12	Male	0.268**	Personal	Male	0.417*
	13	Female	0.319**	Email	Male	0.340 *
	20	Female	0.376*	WhatsApp		

Note. Only those variables with a level of significance are included (**p <0.05; *p<0.01).

In relation to gender, in the first dimension and in the case of student teachers, there is a significant discrepancy with regard to item 4 (I identify, analyze and classify the most appropriate sources of information for each task), where women show a greater degree of agreement [e.g. V_{item4}=0.245, p<0.05].

In the second dimension, female student teachers show greater agreement on item 11 (I make summaries, graphs, diagrams or tables to organize the course material) [e.g., Vitem11=0.315, p<0.05], while female engineering students reveal a significantly higher degree of agreement on item 13 (when I have a lot of information on a subject I know how to organize and systematize it) [e.g. V_{item13}=0.319, p<0.05].

Regarding the third dimension, we found that in Item 20 (my knowledge is really accessible to other students), female engineering students showed a significantly higher degree of agreement than male students [e.g. V_{item20}=0.376, p<0.01]. In the fourth and final dimension, the results reveal that, for student teachers, institutional mail is consulted more often by men than by women [e.g. $V_{instemail}$=0.362, p=0.004]. However, in the case of engineering students, personal mail is the most commonly used [e.g. $V_{persemail}$=0.417, p=0.004].

Table 6. Correlation in relation to age						
	ICT	Age	Cramer's V	Items	Age	Cramer's V
TEACHERS	Instagram	>23	0.329*	2	>21	0.280**
				19	>21	0.282**
ENGINEERS	Facebook	21 a 23	0.419*	12	>21	0.377**

Note. Only those variables with a level of significance are included (**p <0.05; *p<0.01).

With regard to the age range, and continuing with student teachers, in the first dimension, those over 21 years of age show a greater degree of disagreement in item 2 (I consult specialized information through the Internet, email, as well as external and internal university databases), and are also more reluctant to use ICT tools than their under-21 colleagues [e.g. V_{item2}=0.280. p<0.05]. On the other hand, engineering students over 21 years old in the second dimension mostly disagree in item 12 (I discard information that is not relevant to the task) [e.g. V_{item12}=0.377, p<0.05].

As for the third dimension, student teachers over the age of 21 showed greater disagreement in item 19 (in my opinion, it is more important to share knowledge than to possess knowledge) [e.g. V_{item19}=0.282, p<0.05].

In relation to the use of ICT tools, the use of Facebook is more frequent in the 21-23 age group [e.g. $V_{facebook}$=0.419, p<0.01], while Instagram turned out to be a social network rarely used in the academic environment among students over 23 [e.g. $V_{instagram}$=0.329, p<0.01].

3.3. Cluster analysis

To deepen the study of the similarities and differences between the results in both degrees, a cluster analysis was performed (Figures C3 y C4: https://doi.org/10.6084/m9.figshare.12653942.v1). This statistical analysis seeks to group together a number of individuals according to their similarities. In this case, similarities appear in the response patterns offered to KM items and in the patterns of ICT use. The results are represented in the form of dendrograms, in which the length of the vertical bars represents the distance between individuals or groups.

The response patterns to the items included in the different KM dimensions were also very similar among the students of both degrees. Thus, items 31, 33, 34 and 35 are included within the same cluster, both for teaching and engineering students (Figures C3: https://doi.org/10.6084/m9.figshare.12653942.v1). A certain tendency is also observed (although not as clear as in the previous case) to group within the same cluster items 7, 9, 18, 21 and 29 (Figures C3: https://doi.org/10.6084/m9.figshare.12653942.v1).

For the rest of the items it is more difficult to find a general common pattern, but it can be said that, as we have seen in the previous cases, the weakest part in the KM process is the third dimension that corresponds to the management of the resulting learning, the application, creation and dissemination of the new knowledge.

The usage frequencies for personal email, web page, YouTube, institutional email, and WhatsApp have very similar patterns among student teachers and tend to recur quite clearly among engineering students (Figures C4: https://doi.org/10.6084/m9.figshare.12653942.v1). This is the most superficial phase of ICT use so this result is not surprising.

4. Discussion and conclusions

The purpose of the study was, on the one hand, to analyze the usage of fourteen ICT tools by novice students of Education and Engineering in their learning processes and, on the other hand, to know which are the key KM processes for each degree. As shown by the results, both groups of students present a high degree of agreement in all the dimensions of KM except in the fourth one (ICT tools in support of KM). This means that students perceive themselves as capable of collecting data, transforming it into information and later into knowledge at their different learning levels (Choo et al., 2007). Both degrees seem to have clearly assumed the first phase of organizational learning as defined by Slater and Narver (1995), and that relates to the first dimension (information management).

The same occurs in the second dimension (transformation of information into knowledge), which brings together those processes that involve the transformation of information into tacit knowledge, and

from this into explicit knowledge (Nonaka & Takeuchi, 1995). The high degree of agreement shown with regard to the questions posed in this dimension reveals a high degree of maturity in students, in terms of their exercise of cognitive skills such as intuition, interpretation, forms of reasoning, etc. The high percentage of agreement in the third dimension (management of the resulting learning), is related to the organization of learning and to the way in which this allows the application, creation and dissemination of new knowledge. This result agrees with Leiva and Astorga (2014), as it shows that students recognize the importance of processes related to the establishment of explicit knowledge.

In contrast, in the fourth dimension (ICT tools in support of KM), the number of positive responses falls significantly, showing that the degree of total integration of ICT use by teachers is not achieved, as reflected in studies by Manca and Ranieri (2016) as well as Ocaña et al. (2020). This means that there seems to be a lack of adequate strategies in both degrees that allow the value of the knowledge acquired in the university academic environment to be placed within the framework of the information society.

The results of the questionnaire also showed the existence of significant differences in a good number of KM items, since student teachers seem to have a more positive perception (higher level of agreement) and are more capable of seeking, collecting and synthesizing relevant information. In addition, they are more skilled at organizing such information and using it to solve tasks. On the other hand, they are more aware of the importance of organizing and sharing the knowledge acquired; they are more prone to collaborative learning and recognize the importance of an adequate exploitation and management of the resulting learning. Furthermore, they are more active in the processes of creation, application and dissemination of new knowledge. However, it should be noted that these are self-perceptions that may be due to the tendency to provide the expected response that is given in humanities degrees and not in engineering, and that has to do with the honesty and veracity of the responses (Llorens, 2018).

Differences were detected by degree and gender, with female student teachers leading the way in organizing subjects of study, using summaries, graphs or diagrams, while female student engineers are better at organizing and systematizing information. This shows that women have been better at assuming the processes of knowledge integration, showing a greater acceptance in those phases that imply training, routines and systematization of work as defined by Hislop et al. (2018).

Differences were also observed according to the age of the students. It is significant that, for example, student teachers over the age of 21 gave greater importance to possessing knowledge than to sharing it, which is evidence of a more individualistic perception. This is related to the fact that students over 21 tend to be repeaters and are often less integrated with new first-year students. Similarly, engineering students over 21 disagreed with the dismissal of information that was not relevant to the task, again leaving certain deficiencies in the organizational learning process evident in students of this age range.

As far as ICTs are concerned, the importance of these tools for both groups of students is evident, revealing their academic potential as support in the first three dimensions of KM. The most common tools used in the academic environment (more than 50% of students use them daily) were institutional email, WhatsApp, and YouTube. Others such as weblogs, hashtags, and Facebook are less popular among students. Even so, no pattern of ICT use was found in any of the degrees in their first year, so there is a clear deficit in their digital competence (Díaz-García et al., 2015). Furthermore, coinciding with Cabero-Almenara (2015), it is observed that they use ICTs as technological and instrumental tools, but not as training instruments for KM.

To conclude, the lower scores obtained by Engineering students compared to those of Teaching students could be revealing a weakness in the former in terms of KM procedures and methodologies acquired during at least the first year at university. At this point, it is worth asking whether this deviation could be of a conjunctural nature, so that it can be corrected as the student advances in his or her training, or whether, on the contrary, we are faced with a structural situation whose rectification would demand a study of the causes, in order to subsequently design strategies to redirect the situation. One possible cause could be greater insecurity in the choice of studies by engineering students as suggested by Esquivel-Alcocer and Pinto-Sosa (1994). We can also note here the low sense of self-efficacy, accompanied by high rates of absenteeism, which engineering students tend to present during the first years as a result of the difficulty of the studies themselves (López-Fernández et al., 2014).

This work has some limitations, firstly, in relation to self-reported data, as the questionnaire could contain certain types of bias (cultural and/or emotional aspects, voluntarism) that could influence the sincerity of the responses and, secondly, the use of email provides truthfulness, but could limit responses in some students.

In future work, different branches of knowledge should be considered, including a longitudinal study to follow up with the sample in subsequent courses. In addition, it would be advisable to carry out more studies in this line that guarantee an improvement in quality in the university environment.

Funding Agency

This research is supported by the Department of General and Specific Didactics and Theory of Education, and the Department of Mining Technology, Topography and Structures of the University of León (Spain).

References

Abdolvahabi, M., Sofiyabadi, J., Abdolvahabi, M., & Valmohammadi, C. (2014). Case on e-learning and knowledge management practices. *Asian Journal of Research in Business Economics and Management*, *4*(12), 264-264. https://doi.org/10.5958/2249-7307.2014.01022.6

Abu-Naser, S.S., Al-Shobaki, M.J., & Abu-Amuna, Y.M. (2016). Knowledge management maturity in universities and its impact on performance excellence. Comparative study. *Journal of Scientific and Engineering Research*, *3*(4), 4-14. https://bit.ly/33GTWTH

Aguiar, B.O., Velázquez, R.M., & Aguiar, J.L. (2019). Innovación docente y empleo de las TIC en la educación superior. *Espacios*, *40*(2), 8-20. https://bit.ly/2WH4fFS

Ahedo-Ruiz, J., & Danvilla, I. (2014). Las nuevas tecnologías como herramientas que facilitan la educación formativa en la educación. In *Estrategias innovadoras para la docencia dialógica y virtual* (pp. 25-40). https://bit.ly/2xkzlbx

Araya, S., Henríquez, C., Ramírez, & Barra, A. (2018). Explorando la relación entre gestión del conocimiento y el rendimiento organizativo en instituciones de educación superior universitaria. *RISTI*, *17*, 947-959. https://bit.ly/2ZAVa0Q

Bedoya, E.A., Behaine, B., Severiche, C.A., Marrugo, Y., & Castro, A.F. (2018). Redes de conocimiento: Academia, empresa y estado. *Espacios*, *39*(8), 16-30. https://bit.ly/2JbWoIb

Cabero-Almenara, J. (2015). Reflexiones educativas sobre las tecnologías de la información y la comunicación (TIC). *Tecnología, Ciencia y Educación*, *1*, 19-27. https://bit.ly/3bllxwb

Cantón-Mayo, I., & Ferrero-de Lucas, E. (2016). Knowledge management in education journals. *Educar*, *52*, 401-401. https://doi.org/10.5565/rev/educar.757

Castro, J., Castellanos, E., Fonseca, L., & Lugo, J. (2019). Gestión del conocimiento en universidades públicas. *Revista Scientific*, *4*(14), 182-204. https://doi.org/10.29394/scientific.issn.2542-2987.2019.4.14.9.182-204

Cebrián-Cifuentes, S., Suárez-Rodríguez, J., & Aliaga-Abad, F. (2015). Perfiles de competencias tecnológicas y pedagógicas de los/as estudiantes de ingeniería y su relación con el uso de las TIC y algunas variables personales y contextuales. In *Investigar con y para la sociedad. Vol. 3*, volume 3 (pp. 1445-1456). Bubok. https://bit.ly/2ZHilqy

Choo, A.S., Linderman, K.W., & Schroeder, R.G. (2007). Method and context perspectives on learning and knowledge creation in quality management. *Journal of Operations Management*, *25*(4), 918-931. https://doi.org/10.1016/j.jom.2006.08.002

Choo, C.W. (2002). *Information management for the intelligent organization: The art of scanning the environment*. Information Today, Inc.

Colás-Bravo-Bravo, P., Conde-Jiménez, J., & de Cózar, S.R. (2019). The development of the digital teaching competence from a sociocultural approach. [El desarrollo de la competencia digital docente desde un enfoque sociocultural]. *Comunicar*, *61*, 21-32. https://doi.org/10.3916/c61-2019-02

Díaz-García, M.I., Belloch-Ortí, C., Suárez-Rodríguez, J., & Aliaga-Abad, F. (2015). Perfiles de competencia tecnológica y pedagógica en estudiantes universitarios de titulaciones del ámbito educativo. In AIDIPE (Ed.), *Investigar con y para la sociedad* (pp. 1513-1522). Bubok. https://bit.ly/2ZHilqy

Englund, C., Olofsson, A.D., & Price, L. (2017). Teaching with technology in higher education: Understanding conceptual change and development in practice. *Higher Education Research & Development*, *36*, 73-87. https://doi.org/10.1080/07294360.2016.1171300

Enríquez, A. (2019). Gestión de conocimiento y universidad, visión prospectiva a partir de sus expertos. *Revista CS*, *29*, 273-297. https://doi.org/10.18046/recs.i29.2687

Esquivel-Alcocer, L.A., & Pinto-Sosa, J.E. (1994). Toma de decisiones: Autoreporte de los factores que influyen en la elección de una carrera profesional. *Ciencia*, *3*(9), 37-53. https://bit.ly/3drBzXf

Flores-Quispe, M. (2017). *La Gestión del Conocimiento educativo en una organización que aprende*. [Tesis de Maestría, Universidad Cesar Vallejo]. https://bit.ly/3gHx37R

Fox, D.J. (1981). *El proceso de investigación en educación*. EUNSA.

García-Martín, S., & Cantón-Mayo, I. (2019). Use of technologies and academic performance in adolescent students. [Uso de tecnologías y rendimiento académico en estudiantes adolescentes]. *Comunicar*, *59*, 73-81. https://doi.org/10.3916/c59-2019-07

Henderson, M., Selwyn, N., & Aston, R. (2017). What works and why? Student perceptions of 'useful' digital technology in university teaching and learning. *Studies in Higher Education*, *42*(8), 1567-1579. https://doi.org/10.1080/03075079.2015.1007946

Herrera, Z.C. (2019). La gestión del conocimiento en las universidades experimentales de Venezuela. *Revista Scientific*, *4*(11), 380-395. https://doi.org/10.29394/Scientific.issn.2542-2987.2019.4.11.20.380-395
Hislop, D., Bosua, R., & Helms, R. (2018). *Knowledge management in organizations: A critical introduction*. Oxford University Press.
Imamura-Díaz, J.I., Keeling-Alvarez, M., & Barreto-Gelles, I. (2020). La gestión del conocimiento como plataforma para socializar la producción científica. *Ingeniería Industrial*, *41*(1), 1-9. https://bit.ly/3drqEwy
Kaiser, H.F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31-36. https://doi.org/10.1007/bf02291575
Leiva, M.V., & Astorga, D.E. (2014). Condiciones de desarrollo institucional en los centros escolares de Chile. *REDIE*, *16*(2), 35-51.
Liuska-Martínez, N. (2019). Las redes sociales para la gestión del conocimiento. *REFCalE*, *7*(3), 203-211. https://bit.ly/2y6J1qA
Llorens, J. (2018). Autopercepción de los estudiantes acerca de la adquisición de las CTs y su contribución a la mejora de las actividades de aprendizaje. In J. A. Llorens-Molina (Ed.), *IN-RED 2018. IV Congreso Nacional de Innovación Educativa y Docencia En Red* (pp. 1159-1161). https://doi.org/10.4995/INRED2018.2018.8595
López-Fernández, D., Alarcón-Cavero, P., Rodríguez-Sánchez, M., & Casado-Fuente, M. (2014). Motivación en estudiantes de ingeniería: Un caso de estudio con teorías e instrumentos para su medida y desarrollo. *REDU*, *12*(4), 343-343. https://doi.org/10.4995/redu.2014.5627
Manca, S., & Ranieri, M. (2016). Facebook and the others. Potentials and obstacles of Social Media for teaching in higher education. *Computers & Education*, *95*, 216-230. https://doi.org/10.1016/j.compedu.2016.01.012
Maravilhas, S., & Martins, J. (2019). Strategic knowledge management in a digital environment: Tacit and explicit knowledge in Fab Labs. *Journal of Business Research*, *94*, 353-359. https://doi.org/10.1016/j.jbusres.2018.01.061
Masa'deh, R., Shannak, R., Maqableh, M., & Tarhini, A. (2017). The impact of knowledge management on job performance in higher education. *Journal of Enterprise Information Management*, *30*(2), 244-262. https://doi.org/10.1108/jeim-09-2015-0087
Niebles-Núñez, W.A., Hernández-Palma, H.G., & Cardona-Arbeláez, D. (2016). Gestión tecnológica del conocimiento: herramienta moderna para la gerencia de instituciones educativas. *RIDI*, (pp. 25-36). https://doi.org/10.19053/20278306.v7.n1.2016.5633
Nonaka, I., & Takeuchi, H. (1995). *Knowledge and management*. Oxford University Press.
Núñez-Guerrero, Y., & Rodríguez-Monroy, C. (2015). Gestión de recursos intangibles en instituciones de educación superior. *Revista de Administração de Empresas*, *55*(1), 65-77. https://doi.org/10.1590/s0034-759020150107
Ocaña, Y., Valenzuela, A., Gálvez, E., Aguinaga, D., Nieto, J., & López, T.I. (2020). Gestión del conocimiento y tecnologías de la información y comunicación (TIC) en estudiantes de ingeniería mecánica. *Apuntes Universitarios*, *10*(1), 77-88. https://doi.org/10.17162/au.v10i1.419
Paredes-Gavilanes, J., Calvopiña-Andrade, D., Velasco-Samaniego, V., & Álvarez Román, J. (2017). La Gestión del conocimiento y su pertinencia de en la Educación Universitaria. *Revista Científica Hermes*, *19*, 475-475. https://doi.org/10.21710/rch.v19i0.374
R Core Team (Ed.) (2018). *R: A language and environment for statistical computing. R Foundation for Statistical Computing. (version 3.5.3)*. [Software]. https://bit.ly/33HgALs
Raisinghani, M.S., Bekele, R., Idemudia, E., & Nakarmi, A. (2016). Managing knowledge in organizations: Tools & techniques for competitive advantage. *Journal of Business Management and Economics*, *4*(2), 9-13. https://doi.org/10.15520/jbme.2016.vol4.iss2.175.pp09-13
Rodríguez, C., Sanz, M., & Alonso, S. (2019). Technology and higher education: A bibliometric analysis. *Education Sciences*, *9*(3), 169-169. https://doi.org/10.3390/educsci9030169
Rodríguez-Montoya, C., & Zerpa, C.E. (2019). Gestión del conocimiento en programas de postgrado: Un modelo prescriptivo. *Pixel-Bit*, *55*(55), 179-209. https://doi.org/10.12795/pixelbit.2019.i55.10
Ruggles, R. (2017). *Knowledge management tools*. Routledge. https://doi.org/10.4324/9780080509846, https://doi.org/10.4324/9780080509846
Slater, S.F., & Narver, J.C. (1995). Market orientation and the learning organization. *Journal of Marketing*, *59*(3), 63-74. https://doi.org/10.2307/1252120
Stukalina, Y. (2012). Addressing service quality issues in higher education: The educational environment evaluation from the students' perspective. *Technological and Economic Development of Economy*, *18*, 84-98. https://doi.org/10.3846/20294913.2012.658099
Valdez, L., García-Pérez, D., & Maldonado-Guzmán, G. (2016). Management of knowledge, Innovation and Performance in SMEs. *Interdisciplinary Journal of Information, Knowledge, and Management*, *11*, 141-176. https://doi.org/10.28945/3455
Valle-Castañeda, W., Camejo-Puentes, M., & Vilaú-Aguiar, Y. (2019). La gestión del conocimiento en el Licenciado en Educación Primaria. *Mendive*, *17*(3), 409-420. https://bit.ly/31U3KuA
Zabaleta-De-Armas, M.I., Brito-Carrillo, L.E., & Garzón-Castrillón, M.A. (2016). Knowledge management system in the it area for a university in the Colombian Caribbean. *Revista Lasallista de Investigación*, *13*(2), 136-150. https://doi.org/10.22507/rli.v13n2a13

BubusKiski

Audiovisual project for childhood media literacy development

GRUPO Comunicar

Follow us: http://www.bubuskiski.es/

Comunicar
NEW WEBSITE
www.comunicarjournal.com
Comunicar
Comunicar

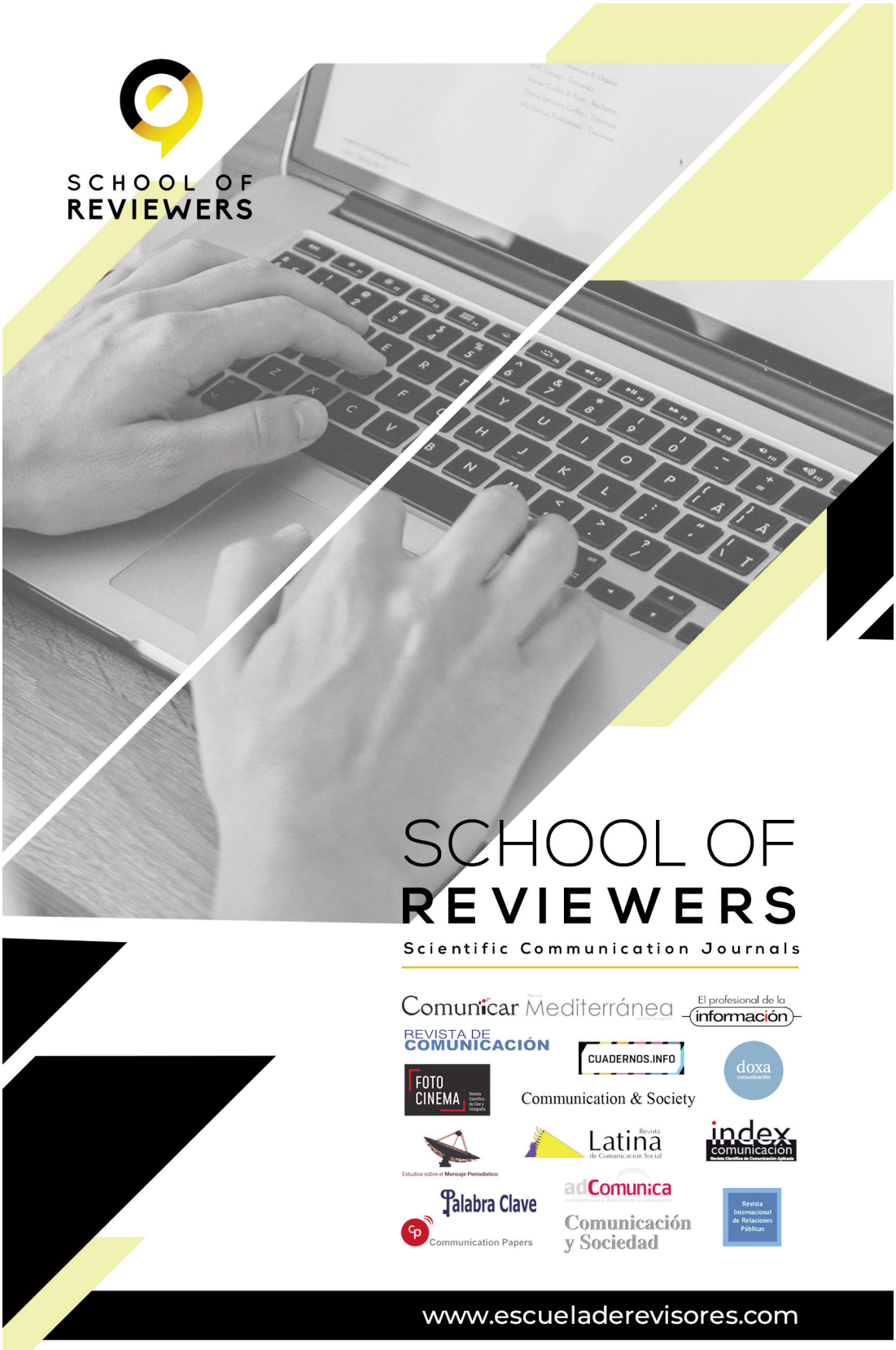
Comunicar 66

Kaleidoscope

Researchs

Studies

Proposals


SCHOOL OF
REVIEWERS
SCHOOL OF
REVIEWERS
Scientific Communication Journals
Comunicar
Mediterránea
El profesional de la información
REVISTA DE COMUNICACIÓN
CUADERNOS.INFO
doxa
FOTO CINEMA
Communication & Society
Latina
index comunicación
Palabra Clave
Communication Papers
adComunica
Comunicación y Sociedad
www.escueladerevisores.com

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

News consumption and risk perception of Covid-19 in Spain

Seguimiento informativo y percepción del riesgo ante la Covid-19 en España

Dr. Alberto Mora-Rodríguez. Associate Professor, Coordinator of the Master's in Applied Political Analysis, Department of Political Science, Social Anthropology and Public Finance, University of Murcia (Spain) (alberto.mora@um.es) (https://orcid.org/0000-0003-2247-6846)
Dr. Inmaculada Melero-López. Researcher, CEMOP Research Group, University of Murcia (Spain) (inmaculada.melero@um.es) (https://orcid.org/0000-0002-0064-9139)

ABSTRACT

Spain is one of the countries that has been most severely affected by the Covid-19 pandemic. In times of uncertainty and stress, the media plays an important role in disseminating information. This study establishes which factors affected risk perception regarding the Coronavirus, which factors determined trust in the measures taken by the Government, and how the presentation of information influenced the spread of fake news. To answer these questions an online survey was created and was completed by 2,034 people from different autonomous communities in Spain, using two multiple linear regression models, as well as different bivariate techniques for parametric statistical analysis. The data shows increased risk perception among the sectors with greater exposure to news about the Coronavirus. A second conclusion refers to the role played by an individual's pre-existing political biases, such as ideology, and their effects on the trust placed in the measures adopted by the Government. In addition, the analysis conducted shows that sectors that follow the news more closely are not immune to the spread of fake news. This research highlights the importance of communication in risk perception and the need to conduct further research in this field, in terms of the psychological, social, and economic implications of this phenomenon.

RESUMEN

España ha sido uno de los países más azotados por la pandemia de la Covid-19. En un contexto de incertidumbre y estrés, los medios de comunicación desempeñan un papel relevante en la difusión de información. En esta investigación se determinan qué factores influyeron en la percepción del riesgo ante el Coronavirus, qué elementos condicionaron la confianza en las medidas adoptadas por el ejecutivo, y cómo influyó la exposición informativa a la propagación de fake news. Para responder a las cuestiones se realizó un cuestionario online en el que participaron 2.034 personas de diferentes comunidades autónomas de España, poniéndose a prueba dos modelos de regresión lineal múltiple, además de diferentes técnicas bivariadas de análisis estadístico paramétrico. Los datos evidencian una mayor percepción del riesgo entre los sectores con mayor exposición informativa a noticias sobre el Coronavirus. Una segunda conclusión referencia el papel que desempeñan las predisposiciones políticas previas del individuo, como la ideología, en la confianza que inspiran las medidas adoptadas por el Gobierno. Asimismo, los análisis realizados muestran que los sectores que realizan un mayor seguimiento informativo no son inmunes a la propagación de fake news. Esta investigación pone de manifiesto la importancia que desempeña la comunicación en la percepción del riesgo, y la necesidad de ahondar en este campo, por las implicaciones psicológicas, sociales y económicas que implica dicho fenómeno.

KEYWORDS | PALABRAS CLAVE

Risk communication, Covid-19, Internet use, communication and media, misinformation, information quality.
Comunicación de riesgo, Covid-19, uso de Internet, comunicación y medios, desinformación, calidad informativa.

Received: 2020-04-18 | Reviewed: 2020-05-18 | Accepted: 2020-05-22 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-06 | Pages: 67-77

1. Introduction and state of the art

1.1. The case of Covid-19 in Spain

The Covid-19 disease, also known as the Coronavirus, first took hold in Spain on 31 January 2020 when the first case was detected on the island of La Gomera in the Canary Islands. Since then, the number of people affected by the virus has been increasing. The rise was slow at first, but later, both the number of infected people and the death toll increased sharply over less than a month and a half (Medina, 2020).

After the WHO officially declared the Coronavirus a pandemic because of its global reach (Sevillano, 2020), the Spanish Government took measures aimed at containing and controlling the virus. Those measures included enacting a state of alarm, which was declared on 14 March 2020, limiting activity, and confining the population to their homes, with further restrictions applied over the following days (Cruz, 2020). By the time of the Royal Decree (enacting the state of alarm), the number of cases had reached 5,753, with 136 deaths and 293 patients in intensive care (Department of National Security, 2020)

The Covid-19 pandemic has led to an unprecedented healthcare crisis and with it a sense of alarm, uncertainty, and chaos among the population, with the search for information acting as the daily antidote to these fears. In this context, this research aims to analyse the effect that news consumption has on risk perception and how ideology affects assessment of the actors involved, trust in the measures and the management of communication during the crisis.

1.2. Risk communication

In any crisis situation, institutions and political leaders attempt to deploy risk communication strategies to improve understanding about certain issues that may trigger risk, as well as reducing and minimising false information and distortions of reality. These communicative strategies make it possible to educate the populace about what the risks are and why, as well as to provide expert knowledge on the subject (Rosas-Rodríguez & Barrios-Puga, 2017). In a crisis as complex as this one, these communicative strategies involve many actors in different operations and strategies (Frandsen & Johansen, 2020).

Although interpersonal relationships and the media are transmitters of information and therefore risk generators (Muñiz, 2011; Morton & Duck, 2001), Rivera-Berrío (2011) further develops the concept of risk communication with what is described as communication 2.0 or interactive and situational communication through the Internet. These types of tools help the process of risk communication more than traditional media such as radio and press which have limited abilities to disseminate information (Gonzalo & Farré, 2011). Social networks and blogs, as well as different online tools, facilitate more effective and situational risk communication, which limits barriers to information and provides exposure to ideas and opinions, giving rise to citizen journalism (Rivera-Berrío, 2011). Ultimately, communication through such tools helps to focus risk communication on the Internet as a method of interaction and integration, creating a community where there is a constant flow of information.

In this new phase, social networks such as Facebook, Instagram, and Twitter, emerge as the main transmitters of information, regardless of the content they disseminate (Flores-Vivar, 2020). In any event, these new channels have certain limitations for media coverage, as a result of the ongoing digital divide associated with age (Rivera-Berrío, 2011). In this respect, older people rely on media such as press, radio and television, media that disseminates warnings and messages about risks to people who do not have access to the Internet or mobile technology (Intrieri et al., 2020). However, the technological divide is reduced in the case of instant messaging (Fernández-Campomanes & Fueyo-Gutierrez, 2014), via applications such as WhatsApp, with a more transversal use across different age groups, easing the receipt of messages and notifications, and fusing interpersonal communications and media coverage. This multi-platform landscape in a context of growing communicative interconnection leads to significant exposure to newsworthy events that may be associated with a certain amount of information saturation.

1.3. Assessment of leaders

In crisis management, which this study pertains to, political leaders take a leading role, not only from a purely managerial point of view, but also the extent to which they are suppliers of information, and even more so in a context of increasing personalisation of politics (Rico, 2009). Nevertheless, the public

perception of political leaders is influenced by the political biases of the populace (Rico, 2009). Ideology is a determining factor in the way in which citizens deal with political and social phenomena, it also continues to be the factor which best explains the electoral behaviour of Spaniards (Torcal & Medina, 2002; Torcal, 2011; Moreno & Mora, 2015). In this sense, the importance of ideology is greater in contexts of significant political polarisation (Justel, 1992), where ideological distance between the parties affects the disconnection between different sections of the media (Casero-Ripollés, 2012), as well as the one that exists between citizens with greater political sophistication, detracting from the explanatory powers of the elite (Rico, 2008). As a result, both variables, leadership and ideology, are factors which undoubtedly affect risk perception.

In a communication process during risk situations, it is technical experts, as well as political leaders, who acquire essential importance as sources of information. On the one hand, the public sector is charged with designing policies and explaining them to the media in a generalised manner, with an emphasis on idealism; while experts, who occupy a middle ground between political leaders and citizens, implement the policies, with their discourse showing greater knowledge of the problem as well as greater clarity in their messaging (González & Jaraíz, 2020).

In addition, the perception of technical experts is more immune to the effects of ideological bias, which is the opposite of what happens with political actors. For these reasons, the reputation of experts tends to be more positive than that of political leaders (Villoria, 2006). On the other hand, the confidence transmitted through the images that leaders project also constitutes a decisive factor when assessing political management of the crisis, which results in greater or lower risk perception.

1.4. Misinformation and fake news

Despite the work that the media, political actors and technical experts do to provide information, the uncertainty associated with any emergency situation, in a context of significant political polarisation, growing disaffection among citizens and a dealignment with elites and institutions, creates the conditions for misinformation in the form of fake news. This is more noticeable with political news (Flores-Vivar, 2020), given that the main objective is to spread deliberate misinformation for political gain (…) (Amorós-García, 2018: 35).

The spread of fake news is generated by media without rules or editorial processes, with negative consequences for the accuracy of the information (Lazer et al., 2018). Meanwhile, the form and style in which this news is produced give rise to misrepresentation and distortion (Field-Fote, 2019). However, the speed with which this type of misinformation is spread and viralised is amplified in technological settings such as those that prevail in modern societies (Shu et al., 2020). This process also involves the concept of news credibility, which may change due to interaction between the original source and the social contact that disseminates the news (Samuel-Azran & Hayat, 2019).

Similarly, the success of these practices is rooted in the mimicking of accurate news in a saturated news environment, making it difficult for the populace to distinguish between truthful and fraudulent information. This exercise in misleading the populace, appealing to the receiver's cognitive limitations, and avoiding data and arguments (Shu et al., 2020), is related to the concept of post-truth, given that its main value is not the objective nature of facts, but rather in emotions and the personal beliefs of public opinion. In other words, "fake news is the high-speed train that takes us directly to post-truth" (Amorós-García, 2018: 184).

In essence, it is a tool that gives rise to the manipulation of reality with content that leads to error and deceit (Romero-Rodríguez & Rodríguez-Hidalgo, 2019). And in that abuse of the populace's feelings and beliefs, it is clear that citizens, to a large extent, limit their exposure to news and media that are consistent with their political biases (Festinger, 1957). This is especially true with ideology in the case of Spain.

The challenge of this phenomenon is to identify and limit false information while analysing the behaviour of online fake news using fact-checkers that enable users to report hoaxes such as in the case of "Maldita", or educate the electorate and provide information as the "Newtral" fact-checker does (Paniagua-Rojano et al., 2020).

2. Material and methods

2.1. Questions and research hypotheses

As explained earlier, monitoring risk or crisis information is an essential process in order to minimise uncertainty. However, greater monitoring and knowledge of the basis for and evolution of a crisis does not necessarily result in a reduction of risk perception. Furthermore, the information saturation associated with complex situations, where a lack of competition combined with alternative information, can result in increased stress and a sense of crisis. In addition, the growth of misinformation and fake news can affect the process of risk perception, especially in those sectors more exposed to information about the crisis on channels with a greater presence and ability to disseminate, resulting in this misinformation. In addition, as happens with the perception of different political and social phenomena, the perception of the resolution of a crisis, the assessment of political leaders and experts, and ultimately, trust in the measures they take, may not respond to an unbiased process of rationalisation, but rather, this perception and assessment may be affected by pre-existing political biases. In this sense, this research aims to answer the three following questions:

- Q1: Which factors influence risk perception for the Coronavirus?
- Q2: Which factors encourage trust in the measures proposed by the Government to resolve the problem of the Coronavirus?
- Q3: How is exposure to and monitoring of information about Coronavirus related to fake news?
- These questions will be used to suggest three research hypotheses:
- H1: Greater exposure to news content about the Coronavirus increases risk perception.
- H2: The evaluation of actors in charge of managing the Coronavirus, and political biases, specifically ideology, affect trust in the measures proposed by the Government to resolve the problem of the Coronavirus.
- H3.1: Greater exposure to news content increases the tendency to share misinformation. H3.2. There is a greater tendency to share misinformation among participants who are on the right in ideological terms, which is related to H2.

To compare the working hypotheses H1 and H2, two multiple linear regression models were tested. Furthermore, there was a prior descriptive analysis of the variables included in the study and an analysis of the possible bivariate statistical association. The approach to H3.1 and H3.2 was to use a bivariate analysis with statistical inference. The configuration of the sample and its distribution regarding the questions about fake news, where participants showed a high level of exposure to misinformation and many acknowledged having been confused and sharing fraudulent information, make it difficult to test the binary logistic regression models as they present an especially low coefficient of determination.

2.2. Method and variables

For the purposes of this study, an online questionnaire was created and sent to professors at different universities in the country and the sample was configured through snowball sampling and sharing on social networks, which made it possible to obtain a representative sample in terms of sex, age and ideological positioning within Spanish society. However, the aim of this research is not to produce a representative picture of the opinions and attitudes of Spanish society, but to observe and analyse the relationships produced between the key variables in this study. A total of 2,034 people from different autonomous communities in Spain participated in the study. Of these people, 52% were women and 48% men, aged between 18 and 78 years old (M=43.89, SD=15.01).

Fieldwork was carried out between 25 and 31 March 2020, during the quarantine period and state of alarm declared by the Spanish government. A structured, closed questionnaire with few questions was used, adjusted to create a model that could be administered to a pre-test of 40 people in order to resolve problems of understanding as well as analysing the internal consistency of the indicators.

The study included the following variables, in response to the issues covered in the theoretical framework and the definition of the research hypothesis:

- Personal risk perception: The scale developed by Morton and Duck (2001) was used to measure the risk participants perceived of being affected by the Coronavirus. The measurement

instrument consisted of four items, relating to how important the problem was for the participants, how worried they were about being affected, what they believed the probability that they would be affected was and how much they felt at risk personally from the Coronavirus. All the items were measured on a Likert-type scale from 1 "very low" to 5 "very high". The internal consistency of the indicator (α=0.700) was calculated from the sum and average of the four variables.

- Exposure to news content: Participants in the study were asked to what extent they had watched the news on various different media channels with the aim of informing themselves about the Coronavirus. This provided information about their exposure to television, radio, press, the Internet (forums, blogs, YouTube, websites), social networks (Facebook, Twitter, Instagram) and WhatsApp, during the health emergency. The level of consumption of each type of media was measured on a Likert-type scale from 1 "not at all" to 5 "a great deal". The internal consistency of the indicator (α=0.603) was calculated from the sum and average of the four variables.
- Exposure to actors providing information: To complement the level of exposure to news content, the participants were asked to what extent they followed the information supplied by the president, ministers, and the team of technical experts. The items were measured on a Likert-type scale from 1 "not at all" to 5 "a great deal". The internal consistency of the indicator (α=0.896) was calculated from the sum and average of the three variables.
- Assessment of actors: Participants were asked how they would evaluate the president, Government spokespeople during the crisis, and Government technical experts. The study also included an assessment of the role played by the main opposition party, the Popular Party. Once again, a Likert-type scale was used, from 1 "very bad" to 5 "very good".
- Trust in the measures implemented by the Spanish government to deal with the Coronavirus: All the items were measured on a Likert-type scale from 1 "not at all" to 5 "a great deal".
- Fake news: The study included four dichotomous variables relating to 1) whether the participants knew that hoaxes and misinformation were circulating with regards to the Coronavirus; 2) whether the participants had received any hoaxes or misinformation referring to the Coronavirus in the previous weeks; 3) whether the participants believed information that they later discovered to be false; 4) whether the participants had shared information that they believed to be true but which they later discovered to be false.
- Ideology: Measured on a Likert-type scale from 1 "left" to 10 "right".

3. Analysis and results

3.1. First approach: Descriptive analysis of the data

A descriptive analysis of the variables and scales subject to study allows us to describe the general characteristics that define the participants in the survey.

With regards to personal risk perception, the results show an elevated risk perception (M=3.88, SD=0.73), out of a maximum of 5. In addition, risk perception is greater in women (M=3.95) than in men (M=3.81), and this difference is a real statistical difference in terms of the results of the t-test for independent samples t=-4.299, p<.05. In terms of exposure to news content, an average of 2.89 (SD=0.80) out of 5five was recorded, without significant statistical differences between men and women. On the other hand, the study shows exposure to actors providing information greater than that registered for the media (M=3.36, SD=1.20), and greater among women (M=3.46) than among men (M=3.25), with a real difference in statistical terms, t=-3.94, p<.05. The information channels with the largest following are television (M=3.42, SD=1.32) and the press, both printed press and online (M=3.41, SD=1.39), followed by social networks (M=2.91, SD=1.47) and the Internet (M=2.89, SD=1.41) The least used information channels for finding information about the Coronavirus are WhatsApp (M=2.53, SD=1.35) and, in last place, radio (M=2.21, SD=1.41).

In terms of assessing the actors, technical experts score most highly (M=3.18, SD=1.33), with the president (M=2.73, SD=1.40) and the Government as a whole (M=2.72, SD=1.36) receiving similar assessments; and the Popular Party receiving the lowest score (M=1.83, SD=1.02). In the first three

cases women gave a slightly higher score than men, while men scored the Popular Party more positively than women. All sex differences, except in the case of assessment of the technical experts, are statistically significant with p<.05.

Trust in the measures implemented by the Spanish government to deal with the Coronavirus is relatively high (M=3.28, SD=1.13), with no recorded differences between the sexes, in terms of the *t*-test for independent samples. With regards to ideology, the average score across the sample is 4.29 (SD=2.07), with statistically significant differences between men (M=4.45, SD=2.12) and women (M=4.13, SD=2.01).

With regards to the variables on fake news, 93.7% of the sample recognised that they were being exposed to hoaxes and misinformation about the Coronavirus in Spain; 88% of the sample had seen manipulated news in the days before completing the survey; 49.1% stated they had believed information that they later discovered to be false; and 22.7% admitted they had shared information that they believed to be real and later discovered to be fraudulent.

3.2. Factors explaining personal risk perception of the crisis

In order to respond to H1, which suggested that greater exposure to news content about the Coronavirus increased risk perception, a multiple linear regression was used that, in addition to the independent variable in the hypothesis, included a series of control variables (Table 1). The resulting equation is statistically significant, F (27.77), p<.001.

The results show that a greater exposure to news content increases personal risk perception with regards to the Coronavirus and is also the second most influential prescriptive variable recorded in the model (β=0.168, p<0.001). With regards to socio-demographic variables, age has an important influence on risk perception (β=0.214, p<0.001), which may be associated with higher levels of disease among older people and has been transmitted by the actors in charge of the crisis and the media since the beginning. On the other hand, sex constitutes another key variable for understanding risk perception, and is greater among women than among men. In general, this is a recurring trend in other research analysing perception of illnesses, traffic accidents, and drug addiction, among others. This may be a result of socialisation processes where women have played a larger role than men in caring for the family and others in general, as well as showing a greater predisposition to protective behaviours and a lower attraction to risky ones.

Table 1. Multiple linear regression, with personal risk perception as a dependent variable

	B	ET	β
Exposure to actors	.060	.020	0.098*
Exposure to news content	.154	.023	0.168***
Sex	.173	.033	0.118***
Age	.010	.001	0.214***
Ideology	.033	.011	0.094*
Ass. of president	.030	.032	0.058
Ass. of Government as a whole	-,018	.034	-0.033
Ass. of technical experts	-.062	.023	-0.111*
Ass. of Popular Party	-.058	.018	-0.081*
Trust in the measures	-.053	.022	-0.081*

Note. N=1772. The sex variable of the participant was re-codified in a dummy variable, where 1 means being a woman. Significance level: *p<.05; ***p<.001

With regards to ideology and exposure to the actors in the crisis, although there is a statistically significant positive association, in that greater exposure to the actors and a more right-wing ideological stance on the part of the participant increases risk perception, the association remains relatively weak. With regards to the variables on assessment of actors, it is important to highlight the lack of a relationship to the president and the Government in the model, with the assessment of the technical experts presenting as the only significant one, and as expected: the higher the score for the technical experts, the lower the risk perception. This difference may be explained by a lower bivariate correlation of ideology and the assessment of experts. The assessment of the management by the Popular Party however is significant although with a comparatively much lower impact when compared to the rest of the significant variables

with a B and a similar degree of trust in the measures put in place by the Spanish government to deal with the Coronavirus.

In terms of the assessment of the Popular Party's response to the crisis, the variable is not statistically significant when included individually in the model, given that there are no significant statistical differences in the risk perception between those who view the PP's management most poorly (3.89 out of 5), and those who scored it most highly (risk perception is 3.96 out of 5).

3.3. Factors explaining trust in the measures proposed by the Government to resolve the problem of the Coronavirus

To determine the effect of the assessment of the actors responsible for managing the Coronavirus crisis and the role of ideology in the trust placed in the measures proposed by the Government to resolve the crisis (H2), the study used a multiple linear regression model which included, along with the hypothesis variables, a group of control variables (Table 2). The equation tested was statistically significant, F (213.902), $p<.001$, explaining the 54.8% of trust in the measures.

The equation confirms the suggested hypothesis. In this respect, the assessment of the actors plays a central role in explaining trust in the measures adopted by the Government and is especially relevant when evaluating the president ($\beta=0.287$, $p<0.001$) and the Government as a whole ($\beta=0.278$, $p<0.001$). For its part, ideology is another essential indicator to understand trust in the measures ($\beta=0.111$, $p<0.001$), showing, as was expected, an inverse relationship. This suggests that the further to the right participants described themselves, the less trust they placed in the measures. A possible explanation for this phenomenon and one that supports the suggested hypothesis is that trust in the measures reflects a simple ex-post rationalisation of pre-existing political biases, suggesting an adaptation of the empirical evidence found on the influence of the economic context on electoral behaviour (Maravall & Przewoski, 2001; Mora, 2017), or on the evaluation of public institutions (Uslaner, 2018). From the communication perspective and reconsidering the concept of selective bias, it is also expected that the media consumption of those further to the right in ideological terms would include editorial positions that are particularly critical of the (left-wing coalition) Government's management of the crisis, with this news content acting to reinforce the populace's ideological bias.

Finally, although with less relative strength if we compare with the previously mentioned variables, the model also shows that the more exposure to news content there is, the less the measures are trusted and the greater the risk perception on the part of the participant, which, on the other hand, is consistent with the evidence collected in the contrast to H1.

Table 2. Multiple linear regression, with trust in the measures as a dependent variable

	B	ET	β
Exposure to actors	.002	.022	0.003
Exposure to news content	-.091	.025	-0.065***
Personal risk perception	-0.063	0.026	-0.041*
Sex	-.060	.037	-0.027
Age	.007	.001	0.090***
Ideology	-.060	.012	0.111***
Ass. of president	.230	.034	0.287***
Ass. of Government as a whole	.231	.036	0.278***
Ass. of technical experts	.092	.025	0.107***
Ass. of Popular Party	-.081	.020	-0.074***

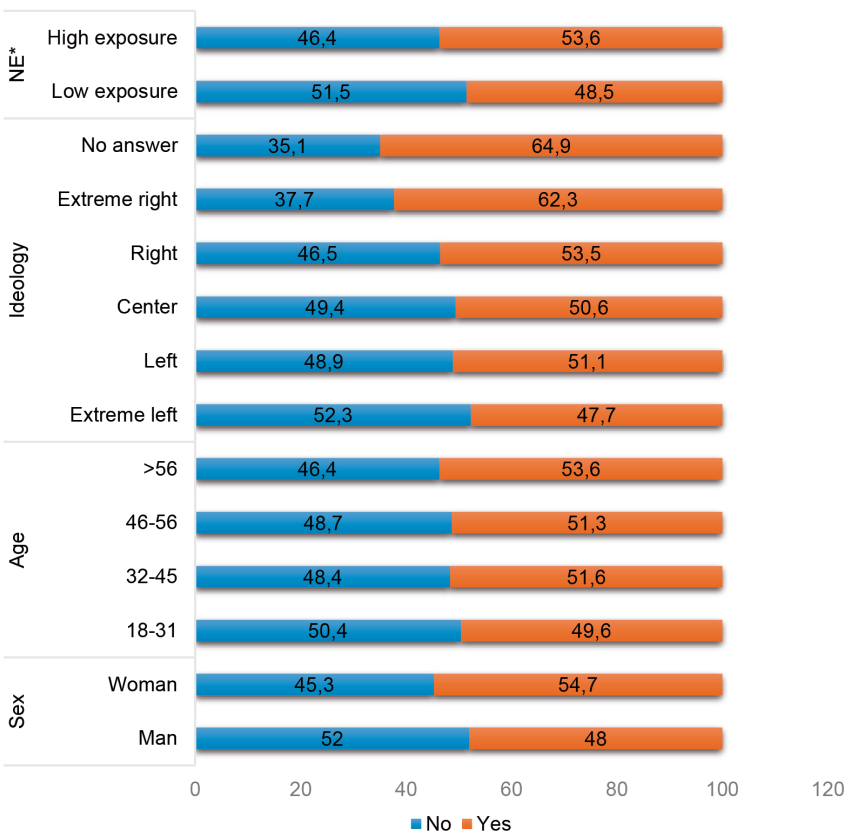
Note. The sex variable of the participant was re-codified in a dummy variable, where 1 means being a woman. Significance level: *p<.05; ***p<.001

3.4. Fake news and monitoring of Coronavirus-related information

As discussed in the theoretical presentation, in situations of uncertainty such as those surrounding the context of a crisis, news about the issue multiply, and these scenarios are used to create and spread misinformation and fake news. This context of information saturation across multiple channels makes it difficult to tell real news apart from fake news. Not even those closely monitoring the news are immune to fake news. The fact that half of those interviewed said that news they initially believed to be true had later

been discovered to be misinformation, alerts us to a worrying situation (Study no.3279-Special Poll April 2020- by the Sociological Research Centre highlights this with the fact that 66.7% of those interviewed thought that news should be restricted and controlled and that there should only be one official source of information). This confusion between real and fraudulent news is reproduced in the different segments of the sample, although there are some slight differences (Graphic 1). Therefore, at the beginning of the results section of the study, women admit to being confused by misinformation to a greater extent than men (Phi=-0.067, p<.01). This confusion about the truthfulness of information also seems to be reproduced to a greater extent among older people, although the differences are not statistically significant.

Figure 1. Confusion about the truthfulness of information



Note: A new dichotomous variable for News Exposure (NE) was created from the rate of exposure to news content. The categories were defined using the 50th percentile of the original variable.

On the other hand, and in accordance with H3.1, people exposed to more news content tend to share this misinformation to a greater extent (Phi=-0.052, p<.05). Finally, in terms of ideology, the study shows that more of those who believed information that they later discovered to be false are those who lean towards the right of the political spectrum and those who did not place themselves on the spectrum, resulting in these statistically significant differences (Phi=-0.076, p<.05), which confirms H3.2. If we analyse the percentage differences between the extreme categories of each variable, we can see that the one presenting the greatest difference is the variable relating to ideology. If we accept the prevalence of political intent in the use of misinformation and fake news, it is reasonable to conclude that a large part of these pseudo-news items is opposed to the Government, which in a process of selective exposure and cognitive alignment with individuals, would have a greater effect on right-wing voters, given the parties that make up the Government.

4. Discussion and conclusions

From the analysis carried out it is possible to draw different conclusions that enrich the debate about the influence of news consumption on risk perception, in this case linked to the crisis provoked by Covid-19 in the Spanish population. In this respect, the results allow us to confirm the existence of a positive relationship between exposure to news content and risk perception. The news channels used most often to obtain information are television, followed by press, both online and printed, social networks and the Internet, while the two least used are WhatsApp and the radio. The data for news monitoring is supported by the Association for Media Research (AIMC) study on media use in Spain, where newspapers reach 42.5% of readers and television has an even greater following, with 85.4% of the population obtaining its information through this channel (AIMC, 2020). Muñiz (2011) presents similar results in a study conducted in Mexico, which also concluded that the effect produced by television was decisive among individuals for risk prediction.

As has been suggested, digital media allows for effective risk communication, with a high degree of citizen participation because of the free exchange of opinions. To this end, previous studies show that older people, although they do not use social networks or online platforms to find information, use other easily accessible media such as television or radio (Intrieri, et al., 2020) and have higher risk perception than younger people. On this occasion the results have been similar, older people perceive the risk of contracting the Coronavirus as higher than the rest of the population. It shows the influence of the media on public opinion in times of crisis (Ball-Rokeach & DeFleur, 1976), such as this research into the Coronavirus. Although online media such as WhatsApp, Facebook, Instagram, and Twitter are the main ways information is disseminated (Intrieri et al., 2020), television takes on an essential role in times of crisis (Muñiz, 2011).

With respect to the second research question, the data suggests that assessment of the actors involved, and trust in the measures implemented by the Spanish government to deal with the Coronavirus cannot be understood without studying the role which political bias plays, specifically ideology, in the rationalisation of these opinions. In this respect, the further to the right the interviewer describes themselves ideologically, the less trust they place in the measures and the lower they score the actors. A possible explanation of this phenomenon, and one that constitutes a justification for the hypothesis suggested by this research, is that trust in the measures implemented respond to a simple ex-post rationalisation of pre-existing political biases (Maravall & Przewoski, 2001; Mora, 2017), that is to say, trust in the measures adopted is greater amongst participants who are more left-wing because of the political parties in Government. In addition, and in a way that is consistent with the previous point, a positive assessment of the President, Pedro Sanchez, and the Government as a whole translated to greater trust that the measures adopted to contain the Coronavirus would be effective. It is also worth highlighting that in this study, assessment of the technical experts is less affected by political bias. These actors inspire greater confidence in comparison with the assessment of political leaders and significantly help to minimise risk perception, which suggests their usefulness in managing communication in the crisis.

On the other hand, with respect to the third and last question of the study, people with greater exposure to news media are not immune to the power of misinformation and fake news, both in terms of its reception, the confusion created by analysing its veracity, and its spread. The analysis suggests that people who follow the news more closely, across the different media channels, can become overwhelmed with news, reducing their critical ability to efficiently evaluate the veracity of the information to which they are being exposed. In this hypothetical relationship between news exposure and misinformation, the ideological biases of the individual and the extent to which the exposure is selective can increase the magnitude of this relationship between variables.

As with any research based on public opinion, it is important to emphasise the limits of this study: the period in which the research was carried out, one of growing stress on society, a crisis in its initial stages, but that would continue for some time, a crisis that gave rise to events with extensive media coverage, the effects of which are not captured in this study. However, the findings support a line of research that is ongoing, relating to the role of media and the management of crisis communication, not only in constructing reality, but also the mood of a society when it is subjected to a highly stressful situation and its freedoms

and lifestyles are restricted. On the other hand, the analysis carried out also has practical implications, showing the importance that technical actors acquire in managing crisis communication as a strategy for creating trust and credibility, as well as highlighting the need for both public institutions and journalists to develop strategies to allow society to discern the truth of the information to which it is exposed.

Funding Agency

This research received support from the Faculty of Political Science at the University of Murcia (Spain).

References

Amorós-García, M. (2018). *Fake New. La verdad de las noticias falsas*. Plataforma Actual.
Asociación para la Investigación de Medios de Comunicación (Ed.) (2020). *Marco General de los Medios en España 2020*. https://bit.ly/3ciGzfu
Ball-Rokeach, S.J., & DeFleur, M.L. (1976). A dependency model of mass-media effects. *Communication Research*, *3*(1), 3-21. https://doi.org/10.1177/009365027600300101
Casero-Ripollés, A. (2012). El periodismo político en España: Algunas características definitorias. In A. Casero-Ripollés (Ed.), *Periodismo político en España: Concepciones, tensiones y elecciones* (pp. 19-46). Cuadernos Artesanos de Latina. https://bit.ly/2yEcCIE
Centro de Investigaciones Sociológicas (Ed.) (2020). *Barómetro especial de abril. Estudio nº 3279*. CIS. https://bit.ly/2yr0Row
Cruz, M. (2020). *Pedro Sánchez echa el cierre 11 días a toda actividad no imprescindible*. El Mundo. https://bit.ly/2ydqhWx
Departamento de Seguridad Nacional (Ed.) (2020). *Coronavirus (COVID-19) – 14 de marzo 2020*. Gabinete de la Presidencia del Gobierno de España. https://bit.ly/2XJfNr5
Fernández-Campomanes, M., & Fueyo-Gutiérrez, A. (2014). Redes sociales y mujeres mayores: Estudio sobre la influencia de las redes sociales en la calidad de vida. *Revista Mediterránea de Comunicación*, *5*(1), 157-177. https://doi.org/10.14198/medcom2014.5.1.11
Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
Field-Fote, E. (2019). Fake News in Science. *Journal of Neurologic Physical Therapy*, *43*(3), 139-140. https://doi.org/10.1097/npt.0000000000000285
Flores-Vivar, J. (2020). Datos masivos, algoritmización y nuevos medios frente a desinformación y fake news. Bots para minimizar el impacto en las organizaciones. *Comunicación y Hombre*, *16*(16), 101-114. https://doi.org/10.32466/eufv-cyh.2020.16.601.101-114
Frandsen, F., & Johansen, W. (2020). Public sector communication: Risk and crisis communication. In V. Luoma-Aho, & M. J. Canel (Eds.), *The Handwork of Public Sector Communication* (pp. 229-244). Wiley-Blackwell. https://doi.org/10.1002/9781119263203.ch15
González, A., & Jaraíz, G. (2020). Las políticas de inclusión social en Andalucía desde la perspectiva discursiva y lexicométrica. Un análisis comparativo del discurso técnico-político. *Empiria*, *45*, 75-111. https://doi.org/10.5944/empiria.45.2020.26305
Gonzalo, J.L., & Farré, J. (2011). *Teoría de la comunicación del riesgo*. UOC.
Intrieri, E., Dotta, G., Fontanelli, K., Bianchini, C., Bardi, F., Campatelli, F., & Casagli, N. (2020). Operational framework for flood risk communication. *International Journal of Disaster Risk Reduction*, *46*, 101510-101510. https://doi.org/10.1016/j.ijdrr.2020.101510
Justel, M. (1992). *El líder como factor de decisión y explicación del voto*. Universidad Complutense de Madrid. Working Paper. https://bit.ly/2ydc385
Lazer, D.M.J., Baum, M.A., Benkler, Y., Berinsky, A.J., Greenhill, K.M., Menczer, F., Metzger, M.J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S.A., Sunstein, C.R., Thorson, E.A., Watts, D.J., & Zittrain, J.L. (2018). The science of fake news. *Science*, *359*(6380), 1094-1096. https://doi.org/10.1126/science.aao2998
Maravall, J.M., & Przewoski, A. (2001). Reacciones políticas a la economía. *Reis*, *89*, 11-52. https://doi.org/10.2307/40184172
Medina, M.A. (2020). *Cronología de la epidemia de coronavirus en España en tan solo mes y medio*. El País. https://bit.ly/2K30zGH
Mora, A. (2000). *El voto económico y estudio de agendas en España: Aproximación a sus efectos en las Elecciones Generales del 2000 y 2011*. [Unpublished doctoral dissertation]. Universidad de Murcia.
Moreno, C., & Mora, A. (2015). Los efectos de la ideología en el comportamiento electoral de los españoles. In A. Martínez, & F. Villaplana (Eds.), *La influencia de la ideología en las campañas electorales. El caso de España* (pp. 15-46). Fragua.
Morton, T., & Duck, J. (2001). Communication and health beliefs. Mass and Interpersonal Influences on Perceptions of Risk to Self and Others. *Communication Research*, *28*(5), 602-626. https://doi.org/10.1177/009365001028005002
Muñiz, C. (2011). Búsqueda de información durante tiempos de crisis. Efectos de la comunicación interpersonal y masiva en la percepción de riesgo personal ante la gripe AH1N1. *Revista de Ciencias Sociales*, *17*(1), 9-21. https://bit.ly/3eoFjlu
Paniagua-Rojano, F., Seaone-Pérez, F., Magallón-Rosa, R., & and (2020). Anatomía del bulo electoral: La desinformación política durante la campaña del 28-A en España. *Revista CIDOB d'Afers Internacionals*, *124*(124), 123-146. https://doi.org/10.24241/rcai.2020.124.1.123
Rico, G. (2008). *La construcción política del carisma: las imágenes de los líderes y su impacto electoral en España*. [Unpublished doctoral dissertation]. Universidad Autónoma de Barcelona.
Rico, G. (2009). *Líderes políticos, opinión pública y comportamiento electoral en España*. Centro de Investigaciones Sociológicas (CIS).

Rivera-Berrío, J. (2011). Hacia un nuevo modelo de comunicación del riesgo. *trilogía Ciencia Tecnología Sociedad*, *3*(4), 45-45. https://doi.org/10.22430/21457778.137
Romero-Rodríguez, L.M., & Rodríguez-Hidalgo, C. (2019). Desinformación y posverdad en los medios digitales: del astroturfing al click baiting. In L. M. Romero-Rodríguez, & D. E. Rivera-Rogel (Eds.), *La comunicación en el escenario digital. Actualidad, retos y prospectivas* (pp. 379-407). Pearson. https://doi.org/10.16921/chasqui.v0i140.4033
Rosas-Rodríguez, M.E., & Barrios-Puga, A. (2017). Comunicación de riesgo, cambio climático y crisis ambientales. *Chasqui*, *136*, 179-194. https://doi.org/10.16921/chasqui.v0i136.3294
Samuel-Azran, T., & Hayat, T. (2019). Online news recommedations credibility: The tie is mightier than the sources. [La credibilidad de las noticias digitales: El vínculo es más importante que la fuente]. *Comunicar*, *60*, 71-80. https://doi.org/10.3916/C60-2019-07
Sevillano, E.G. (2020). *La OMS declara el brote del coronavirus pandemia global*. El País. https://bit.ly/3a2N9Fb
Shu, K., Wang, S., Lee, D., & Liu, H. (2020). Mining disinformation and fake news: Concepts, methods, and recent advancements. *ArXiv*. https://doi.org/10.1007/978-3-030-42699-6_1
Torcal, M. (2011). *El significado y contenido del Centro Ideológico de España*. Fundación Alternativas. https://bit.ly/2RLsJKG
Torcal, M., & Medina, L. (1977). Ideología y voto en España 1977-2000: Los procesos de reconstrucción racional de la identificación ideológica. *Revista Española de Ciencia Política*, *6*, 57-96. https://bit.ly/3cs82LH
Uslaner, E. (2018). *The Oxford handbook of social and political trust*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190274801.001.0001
Villoria, M. (2006). ¿Por qué desconfiamos de los políticos? Una teoría sobre la corrupción política. *Revista del CLAD Reforma y Democracia*, *34*, 1-21. https://bit.ly/2A8FybZ

Universidad de Huelva
un Universidad Internacional de Andalucía
INTERUNIVERSITY MASTER IN
Communication &
Audiovisual education
master-educomunicacion.es

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Presidential Twitter in the face of COVID-19: Between populism and pop politics

Twitter presidencial ante la COVID-19: Entre el populismo y la política pop

Dr. Juan-Luis Manfredi-Sánchez. Professor, University of Castilla-La Mancha, Toledo (Spain) (juan.manfredi@uclm.es) (https://orcid.org/0000-0001-9129-2907)
Dr. Adriana Amado-Suárez. Professor Argentine University of Enterprise, Buenos Aires (Argentina) (aamadosuarez@uade.edu.ar) (https://orcid.org/0000-0001-7275-7991)
Dr. Silvio Waisbord. Full Professor, George Washington University, Washington DC (USA) (waisbord@gwu.edu) (https://orcid.org/0000-0003-0026-7111)

ABSTRACT
This paper analyses the use of Twitter as a presidential communication channel during the first few months of the COVID-19 crisis. The aim is to determine how four recently elected presidents (those of Spain, Argentina, Mexico and Brazil) managed their political communication, and to explore the thesis that they resorted to populist messages during the first months of their terms in office. Using a qualitative methodology and the XL Node tool to capture data, a comparative analysis was performed on the messages posted on their personal Twitter accounts during the first 20 weeks of 2020, classified in six categories: polarization; conspiracy; exaltation and leadership; personalisation and privacy; emotions and feelings; and media publicity. The results indicate that the four presidents share populist traits, but to a different extent. López Obrador and Bolsonaro display a more populist profile, with emotional appeals to the people and to their saving action as regards the implementation of health policies. Conversely, Alberto Fernández and Pedro Sánchez are more akin to the pop politician profile, posting photographs and media messages with a view to receiving press coverage. Both post tweets, based on values and historical events, aimed at their grassroots supporters. The main conclusion is that the pandemic has enhanced the presidential and personalist profiles of the four leaders, although their actions during the COVID-19 crisis were not necessarily in keeping with the populist paradigm. Thus, Sánchez and Bolsonaro implemented a health management communication strategy, while López Obrador and Fernández paid scant attention to health policy.

RESUMEN
El trabajo analiza el uso de Twitter como canal de comunicación presidencialista en el periodo inicial de la COVID-19. El objetivo es conocer el manejo de cuatro presidentes (España, Argentina, México y Brasil) y analizar la tesis del presidencialismo populista en líderes en su primera mitad de mandato. El método es cualitativo y compara los mensajes de la cuenta personal de Twitter las primeras 20 semanas de 2020. Se analizan en seis categorías: polarización, conspiración, exaltación y liderazgo carismático, personalización y vida privada, emoción y sentimientos, y publicidad en medios. Los cuatro presidentes comparten rasgos populistas, pero en distinto grado o caracterización. López Obrador y Bolsonaro ofrecen un perfil más populista con apelaciones emotivas al pueblo y su acción sanitaria salvífica. En cambio, Alberto Fernández y Pedro Sánchez responden al perfil de política pop, de liderazgo mediatizado para que la prensa amplifique sus logros. Se concluye que la pandemia ha acentuado el perfil presidencialista y personalista, aun cuando no encajen en el paradigma populista. Así, Sánchez y Bolsonaro sí despliegan una estrategia de comunicación de gestión sanitaria, mientras que López Obrador y Fernández apenas prestan atención a la política sanitaria.

KEYWORDS | PALABRAS CLAVE
Populism, pop politics, pandemic, COVID-19, political communication, Twitter, infotainment, emotions.
Populismo, política pop, pandemia, COVID-19, comunicación política, Twitter, infoentretenimiento, emoción.

Received: 2020-05-29 | Reviewed: 2020-06-11 | Accepted: 2020-07-02 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-07 | Pages: 79-90

1. Introduction

In just 30 days, the viral mutation that appeared in a market in Wuhan (China) on 30 December 2019 became a global health emergency and pandemic. This crisis has promoted a presidential style that leverages social networks to communicate decisions, to interpret developments and to justify policies. Such emergencies drive "politics of impatience": real time, disintermediation and impulsiveness characterise the communication behaviour of political leaders (Bødker & Anderson, 2019). And, accordingly, the reaction to a crisis like the pandemic can involve populist practices (Moffit, 2014; Moffit & Tormey 2016; Mudde, 2007; Bevelander & Wodak, 2019).

Several characteristics define populism: "A charismatic leader, anti-intellectualism, the use of an emotional communication register and the identification with an idealised nation, as well as a repertoire of action based on provocation, polarisation and protest" (Arias-Maldonado, 2016: 154). Such leaders respect formal principles, but promote anti-pluralist practices (De-la-Torre, 2010) and manipulate public emotions (Beckett & Deuze, 2016), feigning proximity to and interactivity with their audiences (Waisbord & Amado, 2017; Baldwin-Philippi, 2019). In their communication, they identify constituents as fans, with a language that fosters a "time of hyperbole" (Gallardo-Paúls, 2018), posting critical messages and disparaging tweets (Ott, 2017) and resorting to other hostile practices against minorities, immigrants, dissidents, etc. They also undervalue expert opinions because they do not represent the "people" (Waisbord, 2018), and they disdain the press, treating them as adversaries (Waisbord & Amado, 2017), thus eroding independent journalism and democratic values (Bennett & Livingston, 2018; Crilley & Gillespie, 2019), while paradoxically doing their utmost to receive international coverage (Roselle et al., 2014).

Pop politics has found its niche in governmental communication. It is a style of political communication based on personalism and spectacle whose aim is to construct the celebrity politician (Amado, 2016). To this end, celebrity politicians resort to apps (Gómez-García et al., 2019), memes, prime-time TV and mixing with celebrities, or imitating them in a pop spectacle in which they become TV stars, according to the logic of infotainment (Mazzoleni & Sfardini, 2009). All this has paved the way for post-truth politics (Crilley, 2018). It is the ontology of political emotion that explains the collective identity-building of a nation (Canovan, 1999) and its dissatisfaction with existing political institutions (Laclau, 1977). Populist communication is a leadership style that surmounts the division between the Left and the Right to occupy the entire political spectrum.

With the use of emoji, memes, slogans and personal messages, populist leaders seek to imitate the social media behaviour of their followers in order to create an illusory symmetry of communication with them. Presidentialism overexposes opinions and politicises any public communication gesture or initiative. Signalling virtues with emotions or hashtags is an aesthetic commitment. Political emotions leverage feelings and abuse on social media (Arias-Maldonado, 2019; Gerbaudo, 2018; Valera-Ordaz, 2019). They form the backbone of presidential communication, blurring the status of citizen for the benefit of the collective (nation or people). Public affairs are addressed by constructing resonant and binary narratives that exacerbate the divide between "us" and "them", a sort of "emotional polarisation" (Tucker et al., 2018, p. 19). Information is less relevant than the narrative, above all in matters pertaining to historical memory (Ociepka, 2018).

This model disintermediates messages and gives an institutional sheen to any occurrence or comment expressed by executive power, without the usual counterweights (the press, political parties and institutions). Twitter, the most popular channel (Bracciale & Martella, 2017; Van-Kessel & Castelein, 2016; Campos-Domínguez, 2017), circumvents the intermediation of the traditional media, which allows for redefining the frames of foreign policy to adapt them to local and international audiences in a tweet (Golan et al., 2019).

The aim of this study is to gain further insights into the narratives of four presidents with a different ideological bent and stances towards the pandemic, with the main focus on Latin America. Both Manuel López Obrador (LO, Mexico, 2018) and Jair Bolsonaro (JB, Brazil, 2019) have underrated the impact of the pandemic and downplayed its scientific aspects. Whereas Pedro Sánchez (PS, Spain, 2019) and Alberto Fernández (AF, Argentina, 2019) have constructed a discourse more in favour of science and

medicine. These four were chosen because they are all in the middle of their terms of office, have very strong media profiles and are currently governing countries in which the COVID-19 infection has been particularly virulent.

Pandemics can help to broaden our knowledge of the uses of political communication on Twitter in these four countries. To date few comparative studies have been performed on the international debate in Latin America; whereby it is necessary to conduct new research that allows for honing the debate on the relationship between political leadership and Twitter. The hypothesis is that the personalist use of Twitter focuses governmental communication on the figure of the president, which fits with the populist style of political communication. Notwithstanding the differences in government styles, these four leaders use the same communication practices on Twitter, in the context of a new wave of presidentialism. They resort to devices inherent to populism, although these include pop politics techniques. Information on the pandemic is transferred from official channels to their personal accounts, according to their own political agenda, thus constructing and reinforcing a populist leadership style (Block & Negrine, 2017; Enli, 2017; Hallin, 2019; DelaTorre, 2017; Waisbord, 2003). In turn, the search for coverage of their Twitter activity in the traditional media, employing emotional and personal resources, is indicative of pop politics.

2. Research design

The value of the qualitative comparative analysis performed here on four countries, grounded in detailed knowledge (Elman, 2008), has served to determine if the object of study can be broadened (Gerring, 2004). Specifically, the study focused on the personal Twitter accounts of the four presidents because the intention was to examine their discourses, and on their tweets because it is the social network on which official announcements are made and which serves as a reference for the press. It is basically an exploratory study of current affairs, which allows for paving the way for a more exhaustive content analysis. The selection of the study time frame was based on a review of the critical moments of the COVID-19 crisis from 31 December to 20 May 2020, employing the XL Node tool (Hansen et al., 2011). Supplementary data was also captured from the website socialblade.com. The universe comprised a total of 3,079 tweets posted during the study time frame (see Table 1), while the total number of tweets on the four accounts were also compared with media interactions. Open application programming interfaces (APIs) facilitated data collection and the research design.

The sample of each one of the four subjects focused on content relating to the pandemic. To this end, the tool's hashtag search engine was employed to retrieve the hashtags from the database. The hashtags corresponded to the natural language of the subjects, rather than depending on the criteria of the researchers. For this reason, and given that the tweets could contain typos, a manual search was performed on the key days and on the following ones (see Table 1), so as not to depend solely on the tool. After data collection, the explicit content of the tweets was examined. This focused chiefly on detecting references to COVID-19, the pandemic and the measures expressly relating to the crisis (those tweets that only included links to other publications broaching the subject were excluded). Additionally, each tweet was tentatively classified in terms of the prevalence of indicators with a view to establishing an account profile that allowed for putting forward hypotheses on populist leadership (a, b and c) and pop communication (d, e and f). They are not exclusive categories: a) polarisation: the adversary, faction, that they oppose or which distinguishes them; b) conspiracy: suspicions; c) exaltation: nation, ideology, people; d) personalisation: private life, personal achievements; e) emotions: expressing feelings, emoji; and f) media publicity and coverage. These categories inherent to populism have been employed previously (Waisbord & Amado, 2017).

3. Analysis and results

The leaders' Twitter use during the pandemic was compared with their regular activity since opening their accounts (see Table 1). In this respect, there were differences among those leaders who managed to consolidate their accession to power using this social network and those whose position was eroded by the pandemic. JB was the leader who addressed COVID-19 most frequently, not only in quantitative terms but also in proportion to the total number of tweets posted on his account, albeit generating on average

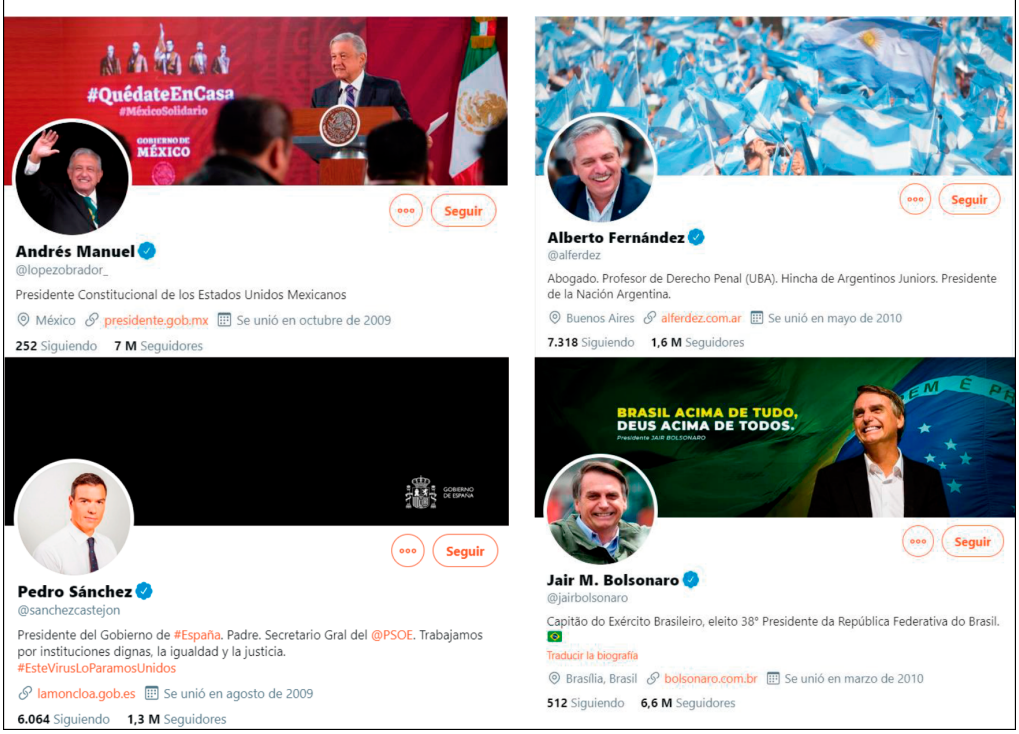
the same number of interactions as his other tweets. AF was the leader who managed to consolidate his account most during the crisis, generating a higher number of interactions and doubling his number of followers, while the tweets posted by LO and PS were below their historical average.

Table 1. Twitter profiles of the leaders with comparative data on their activity during the pandemic

Account (date when opened)	Total no. of tweets on the account	Retweets (overall average)	Favourites (overall average)	Sample tweets (% of the total)	Sample tweets (daily average)	Retweets pandemic (average)	Favourites pandemic (average)	Tweets on COVID-19 (% during pandemic)
@lopezobrador_ (13/10/2009)	4,864	5,720	17,143	258 (5%)	1.82	3,294	11,460	67 (26%)
@jairbolsonaro (31/3/2010)	9,413	5,344	24,086	1,226 (13%)	8.63	4,722	25,444	1,118 (91%)
@sanchezcastejon (25/8/2009)	27,459	639	1573	841 (3%)	5.92	572	1316	405 (48%)
@alferdez (30/5/2010)	26,140	374	652	754 (3%)	5.31	1835	8581	209 (28%)
Total	**67876**			**3,079 (5%)**				**1,799 (58%)**

There were two leaders who posted tweets explicitly mentioning the pandemic: LO with the habitual press conference photo and the hashtag "quédatencasa" appearing in the background; and PS with a black strip as a mark of respect for the 10-day period of mourning decreed at the end of May. PS was the only leader who appeared without a smile on his profile, while JB and AF chose their countries' flags as a backdrop.

Figure 1. Twitter profiles of the four presidents at the beginning of the third month of the COVID-19 pandemic



PS' reaction to the virus was very swift, with an official message being posted on the Ministry of Health's profile (using the account @SaludPublicaEs) on the day that the first infection was detected

in Spain (31 January). Afterwards, the issue disappeared from the agenda, which was devoted to governmental affairs (the economy, euthanasia, the European Union, gender violence, etc.) and to buttressing the governing coalition, for which reason many of the messages highlighted a political polarisation that had nothing to do with the pandemic. On 25 February and as of 9 March, COVID-19 became a relevant issue with an almost daily posting of tweets containing the word "COVID", accounting for half of those posted during the 20-week study time frame. This overactivity is totally understandable in a country heavily impacted by the pandemic. Of the 841 tweets included in the sample 55 per cent used hashtags, three of which were directly related to the pandemic: #COVID19, plus variations (13 per cent); #EsteVirusLoParamosUnidos (10 per cent); and #coronavirus (1 per cent). The hashtag #CMin was also repeated (26), in reference to the decisions of the cabinet and weekly political developments. In sum, PS used his account chiefly to announce press conferences and his speeches to the nation, both daily activities.

In the same vein, LO used his account to comment on his "morning" press conferences without paying special attention to COVID-19, a topic that appeared in 26 per cent of the tweets included in the sample. In his use of Twitter, he seemed to give priority to the press, with which he personally provided his interventions. Each day, he posted a message early in the morning in which he announced his agenda and intentions. More than 111 tweets were posted with Twitter's Periscope live-streaming app, to which should be added 14 tweets with direct links to videos on YouTube, of which 18 of the 20 most retweeted messages using Periscope had to do with his morning press conferences.

During the study time frame, the Mexican president posted 258 tweets, the majority of which (222) did not include hashtags. The most used hashtag was #COVID-19 (15 tweets), followed by #Quedateencasa (14) and #Coronavirus (7). Between January and February, the references to public health were generic, dealing with the right to healthcare, the healthcare system and prevention, without any connection to the pandemic. Indeed, the president was tardy in showing interest in the pandemic, a topic that was not mentioned at all until 11 March with a tweet about its economic impact, followed by the first mention, "Coronavirus COVID 19", although under the title of the morning press conference: 'Specialists are working to prevent scenarios; let's not jump to conclusions and let's act adequately." Twelve days passed between the first infection in Mexico, on 28 February, and LO's public statement.

The quantitative content analysis revealed that the recognition of the impact of COVID-19 on the country's public health was late in coming. The words "coronavirus" (16), "Covid" (16) and "pandemic" (3) appeared 19 days after it had been declared on 30 March, when it was possible to observe a change in the president's routine. He posted 27 tweets with 27 references to public health and five to its economic consequences. The audience followed the same pattern, showing little interest in COVID-19: of the 10 tweets most identified as favourites and retweeted, three addressed the crisis and the president's role in the G-20.

AF's account struck a more personal tone. Even though he had abandoned his controversies on Twitter, insults included, since the 2019 presidential campaign, he still used the platform more for promoting a public dialogue than for disseminating institutional information. He talked about himself in the third person, either to defend his stance or to cite himself in statements made to the conventional press. He mentioned the domains of seven media outlets which he acknowledged to some extent. His account also included many governmental publications. In an average of six tweets a day he used 49 different hashtags, although the majority of his tweets (705) were not tagged. He mentioned "Cuidarteescuidarnos" (4), "argentinaunida" (7) and "yomequedoencasa" (1), but without any specific pattern. Even though AF was the first of the four leaders to mention coronavirus (28 January 2020), he did so to praise the country's capacity to react to a pandemic that, at the time, seemed far off, given that he and his Minister of Health believed that the virus would not affect Argentina. Indeed, the issue was not mentioned again on his account until 10 March, a week after the first case in the country had been confirmed (3 March 2020). Thenceforth, he posted 209 tweets with information on the pandemic and its consequences, with messages aimed at publicising the actions of the Government, at the citizenry and at producing an international impact. A tally reveals the relevance of health issues, with references to coronavirus (50) and Covid (48). Although the audience showed their support (eight of the 10 tweets most identified as

favourites and nine of the 10 most retweeted messages had to do with COVID-19), the most popular tweets were AF's personal greetings, which coincided with spikes in his follower growth rate.

The first infection in Brazil was registered on 25 February. On the 29th, JB posted a tweet on his account about the availability of a Ministry of Health app for preventing and combating COVID-19, which obtained the highest interaction rate as the first tweet on the subject: 7,231 retweets and 39,680 favourites by 20 May 2020, the last day of the study time frame. JB was the most active among the four presidents, with an average of eight tweets per day. He was also the leader who devoted most tweets to the subject, specifically 91 per cent of the sample. This intensive activity allowed him to build an identity on social media based more on actions than on political or institutional communication. Every day, JB tweeted his agenda and a selection of relevant developments, while presenting measures, the press conferences of his cabinet and his interactions with governors, parliament, and international authorities. He often opposed the measures taken by the country's state governors and their press statements, portraying them as adversaries of the Brazilian people, who he referred to presidential decisions. Although he did not use hashtags, he did mention COVID-19 (87) and coronavirus (27).

Figure 2. JB's positioning on Twitter

Follower trends are an indicator that should be taken into account so as to understand the four presidents' activity on Twitter during the pandemic. The spike in new followers on LO's account coincided with a 10-minute personal message of his recorded in the gardens of the National Palace, in which he presented himself as an example to be followed for staying at home on a Sunday, as Minister López-Gattel had recommended, two days after his meeting with Donald Trump. He also offered a number of personal

recommendations and thanked Trump and the president of China. The spike in new followers on AF's account can also be explained by the fact that it coincided with his personal use of it. The day on which he gained the largest number of new followers was 23 March (three days after the start of mandatory lockdown), when between 0.50 and 8.28 am he posted 70 tweets with informal replies to the comments of his followers. Following this, he did not post any further tweets until 7.47 pm when he announced a live update of the Ministers of Economy and Labour with the hashtag #COVID19. These tweets of a personal nature accounted for more than half of those posted during the study time frame.

Unlike the other two leaders, JB put his account to a more institutional use. He started the day coinciding with a spike in new followers with a reply to the opposition Workers' Party (PT), which had called for his resignation, including a photo of his election victory (Figure 2). Shortly before, he had posted a patriotic appeal: "01/04/2020 02:02 am With courage, composure, and patriotism, together we shall win the battle against this epidemic and its effects! We shall fight with all our strength to protect our nation! No Brazilian shall be left behind!" (original uppercase) (https://twitter.com/jairbolsonaro/status/1245139430693896193). That same day, he reported that he was going to meet with Trump. As can be seen in his profile, he often resorts to his military background, because the armed forces have been, after the Church, the most reliable institution in Latin America since the end of the last century (Latinobarómetro, 2015).

PS was the leader who lost followers on Twitter during the first three months of 2020. The most interesting day was 16 March on which he posted eight tweets on his account with the hashtag #EsteVirusLoParamosUnidos, referring to the emergency measures that had been announced in two press conferences, one with the technicians in charge in the morning and another with the Minister of Home Affairs in the afternoon.

Table 2. Popularity during the pandemic

Account	Followers on 31/12/2020	Followers on 20/5/2020	Growth during the pandemic	Daily average of followers	Spike in followers during pandemic	Followers gained during spike
@lopezobrador_	6,350,000	7,043,015	11%	5,232	19/4/2020	39,030
@jairbolsonaro	5,590,000	6,587,972	18%	3,359	1/4/2020	86,050
@sanchezcastejon	1,391,911	1,130,000	-19%	1,869	16/3/2020	8,710
@alferdez	808,630	1,647,678	104%	5,790	23/3/2020	30,230

3.1. Polarisation

It should be noted that in populist discourses there is a greater tendency to attack or demonise rivals rather than towards agonism or conflict, which is a central aspect of politics. On none of the Twitter accounts were there any extreme examples, which leads to the conclusion that the outbursts of the leaders receiving so many comments on social media did not come from their own networks, on which they were moderate. The most controversial case, according to the international press, was that of JB, but on his account there were just generic references to what he considered as the opposition, chiefly left wing, or a generically ideological group: "12/1/2020 14:03 The textbook of the Jair Bolsonaro government: cheaper and without gender politics or ideology" (https://t.co/hSBXIgfCGR); "1/4/20 17:04 The two great woes of the world: communism and coronavirus!"

For his part, LO's antagonistic discourse was directed against previous governments. "20/1/2020 05:00 It's impossible to visit the towns of Oaxaca or other states without coming across the unfinished building works of previous governments" (https://t.co/NXKSTk2VcG). As of 13 March, his account focused exclusively on the COVID-19 crisis and the measures being taken by his government.

PS' tweets focused most on the country's political polarisation, linked to social issues, between the opposition and the governing coalition: "4/1/2020 10:45 We defend freedom. A full freedom from male chauvinism, homophobia, xenophobia, and racism. We shall continue to defend it for as long as it's necessary until condemning intolerance and fanaticism to oblivion: #UnSíParaAvanzar

#SesiónDeInvestidura" (https://t.co/BhPQrHcCJm). For AF, the polarisation emerging during the pandemic was between himself and his Brazilian counterpart, either by retweeting each other's comments or by citing each other in interviews (see Figure 3).

3.2. Conspiracy

The conspiratorial attitudes inherent in populism were mainly found in JB's (28) and AF's (24) tweets. For the former, his enemies were the press that were telling lies and the country's governors who were hindering his work. As none of these attitudes went so far as to include insults or harassment, most of them were classified as conspiratorial, rather than polarising.

JB leveraged the crisis to position himself as a world leader who was on speaking terms with Trump (eight tweets), participated in the G-20 and had ordered the closure of the country's borders. As with his US counterpart, he defended the use of "hydroxychloroquine", mentioning it 21 times. Although this could be understood as a lack of scientific knowledge, he used it to praise Brazilian scientists who were running tests on the drug at the time (see Figure 2), for which reason it was more an attempt to discredit international bodies than anything else. Nonetheless, his references to the press (over 20) were aimed at contrasting his version with that published by some or other media outlet or the freedom of the Internet with the biased information published in the press. During the pandemic, this controversy focused on JB's measures versus those of the country's governors. For AF, the conspiracy had to do above all with disinformation, to the point that one of his measures was to create a platform, under the aegis of the state news agency, for verifying fake news. He also retweeted the messages of other journalists or people whom he accused of falsehood or disinformation, thus supporting that version on his official account.

3.3. Exaltation

The exaltation of ideas, albeit dealing with different topics, was present on all the accounts. Appeals to patriotic feelings, the greatness of Brazil and growth were the central issues on JB's account, sometimes including comparisons with the past to underscore the idea of progress. JB placed the accent on the advances in Brazilian science and on the army's participation in the emergency, on the approval that world leaders had given his measures and on the support that the country had received in the shape of medicines and raw materials. He repeated the word "people" (27 times), so as to appeal to the nation to make a united stand against the virus, and the "armed forces" (6), so as to stress their contribution to combating it, in coherence with the presentation including his military rank on his profile: "23/3/20 0:07 Our armed forces, always remembered in difficult times, they're available to give all possible support to the country's states and municipalities in the war against the coronavirus, with logistics, the transport of health professionals and materials, screening posts, etc. Together we shall prevail!"

The slogan that PS repeated most was "gender (or male) violence", which appeared in 31 tweets. In this regard, the decision to go ahead with the multitudinous march to celebrate Women's Day, on 8 March, when people had already been infected in Spain, was highly criticised later on, which shows that slogans prevailed over the health emergency. The other most important issues included the ecological transition (12 tweets), feminist policies (13 tweets) and historical memory (10 tweets), all reinforcing the distinction between his ideological position and that of the opposition. For his part, LO habitually resorted to the words "people" (48 times) and "indigenous", and to leaders like President Benito Juárez (3). The identity and local folklore markers reflect his emotional use of the digital channel.

In the case of AF, the empty words inherent to this type of discourse – "people" (16 times), "history" (13), "memory" (14) and "democracy" (9) – had populist undertones. He even appealed to the commemoration of the last military coup in Argentina, using the classic slogan alluding to that period, "Never again", to recommend that the citizenry observe lockdown the day after it had been decreed: "24/3/20 11:38 The preventive and mandatory isolation has prevented us from marching today so as to take care of ourselves. But it doesn't prevent us from remembering. On this 24 March, we raise our handkerchiefs at home for memory, truth, and justice. Never again" (https://t.co/nwZIe5P1EB).

3.4. Personalisation

The characteristics of personalisation appeal to emotions, and the focus of the mass media forms the basis of pop politics, which borrows narratives from celebrities. The leader who used Twitter in the most personal fashion was AF. Of the total number of tweets 253 (34 per cent) were greetings (see Figure 2), namely, more than those (209) specifically addressing the pandemic. The majority of these tweets were replies to users or retweets to greet them or to congratulate them on their exemplary behaviour during lockdown, thus relaxing the rules of institutionalised communication to adopt a paternalistic role in which he issued orders to the citizenry while looking out for them.

From an institutional perspective, he not only exhibited his international profile with personal references to the ministers or presidents of Canada, France, Spain, Israel and Bolivia, as well as to Pope Francis, but also underscored his familiarity with them by sharing personal messages or encounters with these personalities. In contrast, PS greeted his peers in foreign languages (16 in English, two in German and one in French, Dutch and Portuguese apiece), playing the role of a world leader.

AF also tended to use Twitter during the pandemic to share his musical tastes and artistic talents with his followers from the privacy of his home. For example, on the 45th day of lockdown, he sent an attentive message with a picture of himself playing the guitar in his official residence (see Figure 3).

Figure 3. Pop narrative and personalism on AF's account

AF was followed by LO, 12 per cent of whose posts (32 tweets) contained personal messages, albeit with a lot less familiarity and interaction than AF. On JB's account, the expression of his personality was evidenced by the inclusion of some or other evangelical event, biblical quotes, and informal strolls in the streets during which he greeted passers-by. Additionally, he posted replies to the tweets of other world leaders (Rudy Guiliani, Xi Jin Ping and Trump), so as to underscore his close relationship with them, while also expressing his gratitude for interviews to his liking and celebrating his growth on social media.

Lastly, he mentioned the evolution of his medical analysis of the virus, while referring to religion with biblical quotes and direct references to "God" (19), including his slogan "God above all" (six times): "19/3/20 0:42 I shall never abandon the Brazilian people to whom I owe absolute loyalty! Good night to all!" (https://twitter.com/jairbolsonaro/status/1240438417005129728).

3.5. Emotions

Emotions were explicitly expressed, mainly in the form of gratitude, sorrow, or hope. The use of emoji says a lot about the emotions characterising each account. In the case of JB, the most used emoji was the thumbs-up, an affirmative gesture very popular in Brazil, as well as the handshake emoji to express closed agreements. Albeit to a lesser extent, LO used them explicitly: "21/3/2020 03:27 I wanted to cover her with kisses, but I couldn't so as to keep a safe distance. She's a gem" (https://t.co/rmlfj9XA1e).

PS also resorted to emoji, which he included in a large variety of resources and references, such as arrows and emoticons characteristic of certain events, a red dot indicating the broadcasting of a press conference and the rose emoji (the logo of the Spanish Socialist Workers' Party). For his part, AF also used emoji and even a sticker representing him, created with an iPhone, with which he posted the majority of his tweets. Emotions were also present in the personalisation variable, given that most of his messages aimed at his followers were affectionate, expressing a closeness, whether real (he sometimes employed expressions indicating familiarity) or feigned, since it was not always that clear.

Figure 4. LO and PS with a focus on information for the press

3.6. Publicity and press

The pop politician yearns for media coverage through press releases and traditional publicity announcements. Since he was the leader with the tensest relations with the press, JB resorted less to sharing press conferences on Twitter. As with AF, he was accustomed to posting extracts with his statements or interviews that were to his liking, but only a few press conferences with a Q&A round for journalists. In this respect, they both contrasted with PS and LO who devoted Twitter mostly to the press. In view of the number of posts referring to press conferences in the sample, PS was the leader who posted most tweets in this regard (150, accounting for 37 per cent of the sample). For his part, LO posted 36 tweets mentioning press conferences (54 per cent). One of the tactics of pop politicians is to greet or refer to popular entertainers, something that all four of the leaders did, thus allowing them to engage the followers of these celebrities. AF was the leader who resorted to the greatest number of celebrities, although JB, in his support for a singer who had been insulted, was the one who generated the highest number of interactions in the sample.

4. Discussion and conclusions

Although, theoretically speaking, the leaders analysed here do not only fall in the populist category, they do indeed share a narrative with characteristics that have been identified as populist in previous studies, albeit with variations and to a greater or lesser degree. The analysis of their Twitter accounts demonstrates that these differences correspond to their personal communication style, something that was already evident in their respective election campaigns. This supports our research hypothesis that their way

of conveying messages and their presidential style are personalist. LO and JB offer a populist narrative based on the exaltation of values like the nation, history, and memory, plus the armed forces. Both offer a repertoire of national aggrandisement and pride. JB exemplifies the polarised and conspiratorial discourse, expressing his doubts about certain medical decisions (hydroxychloroquine). LO embodies a personalist style, making all governmental action revolve around his presidency, in which each action is self-classified as a historical event. In contrast, AF, and PS distance themselves from the populist model and are more in line with pop politics, in the manner of cultural celebrities. AF's personality rests on values like national exaltation, honouring the country's historical memory, its science, and the legacy of Kirchner. PS opts for communication tailored to the press: each tweet is a journalistic piece, a headline, a press photo. With this strategy, he aspires to use the press as a sound box for his messages. And both aim messages at their militants, linked to the party, with a combination of governmental initiatives and actions.

The four leaders implement a personalisation strategy (it is they who inform, guide, and suffer), as well as constantly appealing to political emotions (affliction, gender violence, unity, etc.). There are neither hate speeches nor ultra-radical attitudes on their accounts, which contrasts with the hostility shown towards them on other accounts, irrespective of whether they are official or unofficial. There are also differences in their handling of governmental communication. PS and JB report on management decisions, medical initiatives, and new developments in the pandemic. While LO and AF hardly post any tweets on the administration or health-related decisions. JB and AF comment frequently on disinformation and the direct need to give priority to official sources over the news media.

JB and AF aim their messages at their grassroots supporters, with an eye to reinforcing their political identity and projects. Conversely, PS and LO employ Twitter as a press channel, namely, to promote their canned messages and slogans for reproduction by the media. Their tweets are press headlines. All four presidents reply to other accounts, which suggests levels of direct interaction that were conspicuous by their absence on the accounts of their predecessors (Waisbord & Amado, 2017). A network analysis would help to distinguish between those messages promoting hate and those that provoke the anger of the citizenry, a key aspect in current international political communication (Zaharna, 2018). Another possibility would be the study of semantic networks which would make it possible to expressly substantiate the interpretation of their presidential political communication and the conceptual frames of their presidencies.

Funding Agency

This study was supported by "Public diplomacy in Latin American mega-cities: communication strategies and soft power to influence global environmental legislation" (RTI2018-096733-B-I00), and by the Institute of Social Sciences and Project-based Disciplines (INSOD), Universidad Argentina de la Empresa (P19S04).

References

Amado, A. (2016). Política pop: De líderes populistas a telepresidentes. Ariel.

Arias-Maldonado, M. (2016). La digitalización de la conversación pública: redes sociales, afectividad política y democracia. *Revista de Estudios Políticos*, *173*(173), 27-54. https://doi.org/10.18042/cepc/rep.173.01

Arias-Maldonado, M. (2019). Understanding fake news: Technology, affects, and the politics of the untruth. *Historia y Comunicación Social*, *24*(2), 533-546. https://doi.org/10.5209/hics.66298

Baldwin-Philippi, J. (2019). The technological performance of populism. *New Media & Society*, *21*(2), 376-397. https://doi.org/10.1177/1461444818797591

Beckett, C., & Deuze, M. (2016). On the role of emotion in the future of journalism. *Social Media + Society*, *2*(3). https://doi.org/10.1177/2056305116662395

Bennett, W., & Livingston, S. (2018). The disinformation order: Disruptive communication and the decline of democratic institutions. *European Journal of Communication*, *33*(2), 122-139. https://doi.org/10.1177/0267323118760317

Bevelander, P., & Wodak, R. (2019). *Europe at the crossroads: Confronting populist, nationalist and global challenges*. Nordic Academic Press.

Block, E., & Negrine, R. (2017). The Populist Communication Style: Toward a critical framework. *International Journal of Communication*, *11*, 178-197. https://bit.ly/2zGNG3s

Bødker, H., & Anderson, C. (2019). Populist time: Mediating inmediacy and delay in liberal democracy. *International Journal of Communication*, *13*, 5948-5966. https://bit.ly/36J52Jd

Bracciale, R., & Martella, A. (2017). Define the populist political communication style: The case of Italian political leaders on Twitter. *Information, Communication & Society*, *20*, 1310-1329. https://doi.org/10.1080/1369118x.2017.1328522

Campos-Domínguez, E. (2017). Twitter y la comunicación política. *El Profesional de la Información*, *26*(5), 785-785. https://doi.org/10.3145/epi.2017.sep.01

Canovan, M. (1999). Trust the people! Populism and the two faces of democracy. *Political Studies*, *47*(1), 2-16. https://doi.org/10.1111/1467-9248.00184
Crilley, R. (2018). International relations in the age of 'post-truth' politics. *International Affairs*, *94*(2), 417-425. https://doi.org/10.1093/ia/iiy038
Crilley, R., & Gillespie, M. (2019). What to do about social media? Politics, populism and journalism. *Journalism*, *20*(1), 173-176. https://doi.org/10.1177/1464884918807344
De-la Torre, C. (2010). *Populist seduction in Latin America*. Ohio University Press.
De-la Torre, C. (2017). Trump's populism: Lessons from Latin America. *Postcolonial Studies*, *20*(2), 187-198. https://doi.org/10.1080/13688790.2017.1363846
Elman, C. (2008). Symposium on qualitative research methods in political science. *The Journal of Politics*, *70*(1), 272-274. https://doi.org/10.1017/s0022381607080206
Enli, G. (2017). New media and politics. *Annals of the International Communication Association*, *41*(3-4), 220-227. https://doi.org/10.1080/23808985.2017.1392251
Gallardo-Paúls, B. (2018). *Tiempo de hipérboles. Inestabilidad e interferencias en el discurso político*. Tirant Humanidades.
Gerbaudo, P. (2018). Social media and populism: An elective affinity? *Media, Culture & Society*, *40*(5), 745-753. https://doi.org/10.1177/0163443718772192
Gerring, J. (2004). What is a case study and what is it good for? *American Political Science Review*, *98*(2), 341-354. https://doi.org/10.1017/s0003055404001182
Golan, G., Manor, I., & Arceneaux, P. (2019). Mediated public diplomacy redefined: Foreign stakeholder engagement via paid, earned, shared, and owned media. *American Behavioral Scientist*, *63*(12), 1665-1683. https://doi.org/10.1177/0002764219835279
Gómez-García, S., Gil-Torres, A., Carrillo-Vera, J.A., & Navarro-Sierra, N. (2019). Constructing Donald Trump: Mobile apps in the political discourse about the President of the United States. [Creando a Donald Trump: Las apps en el discurso político sobre el presidente de Estados Unidos]. *Comunicar*, *59*, 49-59. https://doi.org/10.3916/c59-2019-05
Hansen, L.K., Arvidsson, A., Nielsen, F., Colleoni, E., & Etter, M. (2011). Good friends, bad news-affect and virality in Twitter. In J. Park, L. Yang, & C. Lee (Eds.), *Future information technology. Communications in computer and information science future information technology* (pp. 34-43). Springer. https://doi.org/10.1007/978-3-642-22309-9_5
Laclau, E. (1977). Towards a theory of populism. In E. Laclau (Ed.), *Politics and Ideology in Marxist Theory* (pp. 143-200). New Left Books.
Latinobarómetro (Ed.) (2015). *La confianza en América Latina 1995-2015*. Santiago de Chile: Santiago de Chile. https://bit.ly/2X7Ebn1
Mazzoleni, G., & Sfardini, A. (2009). Política pop. Da 'Porta Porta' a 'L'isola dei famosi. Collana Contemporanea. Il Mulino.
Moffitt, B. (2016). *The global rise of populism. performance, political style, and representation*. Stanford University Press. https://doi.org/10.11126/stanford/9780804796132.001.0001
Moffitt, B., & Tormey, S. (2014). Rethinking populism: Politics mediatisation and political style. *Political Studies*, *62*(2), 381-397. https://doi.org/10.1111/1467-9248.12032
Mudde, C. (2007). *Populist radical right parties in Europe*. Cambridge University Press. https://doi.org/10.1017/CBO9780511492037
Ociepka, B. (2018). Public diplomacy as political communication: Lessons from case studies. *European Journal of Communication*, *33*(3), 290-303. https://doi.org/10.1177/0267323118763909
Ott, B.L. (2017). The age of Twitter: Donald J. Trump and the politics of debasement. *Critical Studies in Media Communication*, *34*, 59-68. https://doi.org/10.1080/15295036.2016.1266686
Roselle, L., Miskimmon, A., & O'Loughlin, B. (2014). Strategic narrative: A new means to understand soft power. *Media, War & Conflict*, *7*, 70-84. https://doi.org/10.1177/1750635213516696
Tucker, J., Guess, A., Barbera, P., Vaccari, C., Siegel, A., Sanovich, S., Stukal, D., & Nyhan, B. (2018). *Social media, political polarization, and political disinformation: A review of the scientific literature*. Social Science Research Network. https://doi.org/10.2139/ssrn.3144139
Valera-Ordaz, L. (2019). Liberal individualist, communitarian, or deliberative? Analyzing political discussion on ernstok based on three notions of democracy. *International Journal of Communication*, *13*, 1056-1076. https://bit.ly/2zGNG3s
Van-Kessel, S., & Castelein, R. (2016). Shifting the blame. Populist politicians' use of Twitter as a tool of opposition. *Journal of Contemporary European Research*, *12*(2), 594-614. https://bit.ly/2ZLU18n
Waisbord, S. (2018). The elective affinity between post-truth communication and populist politics. *Communication Research and Practice*, *4*(1), 17-34. https://doi.org/10.1080/22041451.2018.1428928
Waisbord, S., & Amado, A. (2017). Populist communication by digital means: Presidential Twitter in Latin America. *Information, Communication & Society*, *20*(9), 1330-1346. https://doi.org/10.1080/1369118x.2017.1328521
Zaharna, R.S. (2018). Digital diplomacy as diplomatic sites: Emotion, identity & do-it-yourself politics. In V. Stanzel (Ed.), *New realities in foreign affairs: Diplomacy in the 21st century* (pp. 105-114). German Institute for International Security Affairs. https://doi.org/10.5771/9783845299501-105

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Media representation of minors who migrate on their own: The MENA in the Spanish press

Representaciones mediáticas de los menores que migran solos: Los MENA en la prensa española

Dr. Juan-David Gómez-Quintero. Associate Professor, Department of Psychology and Sociology, University of Zaragoza (Spain) (jdgomez@unizar.es) (https://orcid.org/0000-0002-2036-7817)
Dr. Jesús-C. Aguerri. Associate Lecturer, Sociology Department, University of Burgos (Spain) (jcarreras@ubu.es) (https://orcid.org/0000-0002-7730-8527)
Dr. Chabier Gimeno-Monterde. Assistant Professor, Department of Psychology and Sociology, University of Zaragoza (Spain) (chabierg@unizar.es) (https://orcid.org/0000-0002-5746-1372)

ABSTRACT
This article analyses Spanish media treatment of a certain type of immigrant: the unaccompanied foreign minor ("MENA" in Spanish). The media play an important role in creating and disseminating ideas and images amongst the general public, thereby promoting the articulation of sets of meanings called discourses. The main goal of this research is to identify the discursive approaches that have been constructed around the term "MENA" in the main Spanish daily newspapers. To this end, we gathered and analysed all the news reports published between January 2017 and October 2019 by the digital editions of the four most widely-read newspapers in Spain (La Vanguardia, El País, El Mundo and ABC). This analysis was performed using text mining techniques (an important field in data science) such as term frequency, inverse document frequency, and correlation networks between words. Our results show that the term "MENA" evokes a criminalising, moralistic, welfare-dependent discourse that is articulated from an adult-centric, nationalist perspective. The study concluded that the conservative press uses the acronym more frequently than the left-wing media. However, no significant discursive differences were observed between conservative and progressive press in terms of the language used, which often had negative connotations that stigmatised the young people concerned.

RESUMEN
Este artículo tiene como objeto abordar el tratamiento mediático realizado por la prensa española sobre una tipología de inmigrante: el menor extranjero no acompañado «MENA». Los medios de comunicación tienen un papel relevante en la creación y difusión de conceptos e imágenes entre el público, de tal modo, promueven la articulación de conjuntos de significados llamados discursos. La investigación se propone identificar los enfoques discursivos construidos en torno a la sigla «MENA» en los principales diarios de la prensa española. Para llevar a cabo esta tarea se han recopilado y analizado todas las piezas informativas publicadas sobre menores migrantes en las ediciones digitales de los cuatro diarios más leídos en España (La Vanguardia, El País, El Mundo y ABC) entre el 1 de enero de 2017 y 31 de octubre de 2019. Estas piezas han sido analizadas mediante técnicas de minería de datos (un área relevante dentro de la ciencia de datos) tales como la observación de «term frequency» y de «inverse document frequency». Estas técnicas, junto a la construcción de redes de correlaciones entre palabras, han permitido observar que el término «MENA» evoca un discurso asistencialista, criminalizador y moralista desde un enfoque adultocéntrico y nacionalista. Asimismo, se concluye que la prensa conservadora usa más la sigla que la prensa progresista, pero sin divergencias significativas en el lenguaje utilizado.

KEYWORDS | PALABRAS CLAVE
Teens, immigrants, press, content analysis, text mining, MENA.
Adolescentes, inmigrantes, prensa, análisis de contenido, minería de datos, MENA.

Received: 2020-04-30 | Reviewed: 2020-05-24 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-08 | Pages: 91-101

1. Introduction and state of the art

Child and youth migrations from the Global South to the Global North are part of the current migration scenario (Bhabha et al., 2018). Since the end of the last century, and under the legal designation of "unaccompanied foreign minors", international agreements have regulated the institutional reception of minors who migrate alone, through their protection by child care systems (Menjívar & Perreira, 2017). As their parents are not present, local administrations assume this task until these adolescents' reach adulthood. From that point on, the states begin to apply ordinary immigration law to them (Sigona et al., 2017).

This migration, with thousands of children and teenagers crossing borders between economically and geopolitically linked regions, has strained the legal and social interpretation of Human Rights, giving rise to friction between protection of the most vulnerable and control of access to the territory of each state. (Knezevic, 2017). The media, reflecting the current social and political debates on the recognition of "ius migrandi" (Velasco, 2016), have included the figure of the migrant minor as a new actor that is receiving increasing attention (Rosen & Crafter, 2018).

The aim of this article is to describe and analyse the informative treatment recently given by the Spanish press when reporting on migrant teenagers, often under the legal acronym, "MENAS". Specifically, the study aims to understand the discursive configurations employed by the Spanish press towards this population. Journalistic information is a source that feeds these configurations (Benson, 2013) and constructs an interpretative framing of reality, a determining factor in the assignment of one sense or another in the observation of reality (Koziner, 2013). There are other expressions of public opinion, such as opinion polls, barometers, etc. (Miller, 2006). In this case, the strengths of the approach chosen are based on the breadth and heterogeneity of sources and information that form part of public opinion, notwithstanding other weaknesses of this methodological option, such as the external and general description of the information.

In the case of the Spanish media, the interest in this youth mobility parallels its two most recent migration cycles. During the first decade of the century, several thousand minors arrived in Spain yearly, at a steadily increasing rate, which reached 8,080 new arrivals in 2008 (Quiroga, 2010), the highest number in that initial stage. As of 2009, this figure decreased to 3,261 in 2012. And towards the end of the second decade, since 2017 (6,414 arrivals) there has been a constant increase in detected arrivals, up to the 12,300 minors registered in 2019 (Save the Children, 2018; State Attorney General's Office, 2020). The sector is highly masculinised (only 6% were girls). Of these, and according to the regions, between 75% and 80% come from North Africa (Morocco and Algeria), and the rest from the west of this continent; with very low presence of Asian minors.

As previously occurred in Italy (Giovannetti, 2016), the local authorities responsible for child protection have seen their capacity to implement resources for foster care overwhelmed. This new "migratory crisis" has contributed to a technical and political debate on the care protocols for these minors, with two key characteristics. It is presented as an issue disconnected from its global dimension and, as in other social policies in southern Europe, it is addressed without taking into account the previous experience in institutional protection, accumulated during the first migration cycle (Gimeno, 2018). Due to these two deficiencies, two poles of discourse arise. One implicit and the other explicit. Explicitly, state and regional legislation establishes the obligation to protect any minor in a legal situation of homelessness, regardless of their nationality. Meanwhile, implicitly, the local authorities, depending on the government's ideological bent, are responsible for avoiding the "pull effect" that a reception with guarantees might entail (Peris, 2015). This tension between child protection and immigration control would be behind the filtering or selection that underlies the protection measures. The media modulate discourses that contribute to the integration or exclusion of this population (Rigoni & Saitta, 2012).

1.1. Frame of contemporary migration policies and the media

As G. Simmel stated at the time, the "foreigner" is a model of interaction that is constantly being re-signified in time and space (Santamaría, 2002). The media play a relevant role in this interplay of meanings (Vickers & Rutter, 2016), imbuing the concept of "immigrant" with content (Bleich et al., 2015) and creating symbolic borders between what is one's own and what is "the other" (Dines et al., 2015). In

this way, Spain has entered the debate of whether the MENAS are part of society, as a moral community of belonging. In fact, a large part of the regulatory framework and social intervention practices do not consider these adolescents "our children" (Gimeno, 2013; Suárez, 2004). Santamaría (2002) observed that most of the metaphors used in the informative treatment of immigration described a disturbing and worrying phenomenon. Several studies in the field of youth migration have confirmed this observation (Rosen & Crafter, 2018; Doná & Veale, 2011).

The metaphors of exile and migration use phytomorphic semantic fields (root, roots …) as well as zoomorphic (herds, flocks …) imagery suggesting collective behaviour. Van-Dijk (2005) talks about watery metaphors (flows, surges, avalanches …) that amplify demographic magnitudes and challenge public powers to channel or contain these currents. Of all provenances, Arab-Muslims are the archetype through which immigration is thought of as the antipode to cultural difference (Santamaría, 2002; Mateo, 2017). In this rhetorical context, the term "MENA" has emerged as a designation for certain migrant minors. This term implies a positive definition (they are Moroccan and Muslim) and a negative one that exposes two shortcomings: they are not yet of legal age and are not accompanied (Gimeno, 2013). The second involves not knowing their previous and present relationships, as well as doubting their ability to establish them in the future. The founding work of the IOÉ Collective (1995) on Spanish discourse regarding foreigners identified the appearance and extension of what is irregular or "illegal" beyond the entry procedure, generating a moral panic of administrative justification (Santamaría, 2002). Thus, the procedure plays a role of procedural illegitimacy of mobility (Doménech, 2013; Perelló & Lacomba, 2020).

The media play a determining role in the social construct of threat and security (Horsti, 2003; Balzacq, 2005; Perelló & Lacomba, 2020). Media outlets have the ability to influence public opinion, both by presenting a certain image of a population, and by amplifying or silencing specific voices (Horsti, 2003; Hoekstra, 2015). Van-Dijk (2005) warns that there is a direct relationship between language and the power exercised with it, as the discourses reproduce the cultural hegemony of elites over the subaltern social groups.

Research works in Spain (Checa-Olmos & Arjona-Garrido, 2011; Llorent-Bedmar, 2012), Italy (Terwal, 1996), Finland (Horsti, 2003; 2012) or Belgium (Van-Gorp, 2005) reflect this relationship. In addition to the value that migrant receiving societies place on administrative procedures, contemporary migration policies are also based on various economic, cultural and social paradigms. (Thorbjørnsrud & Ustad Figenschou, 2014; Eberl et.al. 2018) among which this research highlights two that are apparently contradictory: securitisation and humanitarianism (Perelló & Lacomba, 2020). For Bourbeau (2011), securitisation is the process of discursive and institutional integration of a problem within the frameworks of security, police action, control and defence. Security is a matter of survival. In this way, security is the way for states and societies to rid themselves of threats and maintain their independence and functional integration in the face of forces of change acknowledged as hostile. (Buzan, 2007).

On the other hand, humanitarianism differs from humanitarian discourse by the validity of the approach of immediacy and constant emergency that is triggered in the form of exceptionality. Justice and rights are thus replaced by charity or benevolence, which is tantamount to acting from a paternalistic standpoint (Andersson, 2014; Ticktin, 2015). Urgency in the implementation of some reception operations entails the decontextualisation of migratory phenomena, as they are treated as unique and unforeseen crises, when in reality they have a long historical tradition (Ticktin, 2015). Another feature of humanitarian discourse is the outsourcing by the State to private agents of the provision of medical and social assistance to migrants in controlled spaces (Perelló & Lacomba, 2020). The humanitarian construct produces victims and the security construct produces threats (Van-Gorp, 2005; Horsti, 2012), in such a way that the news stratifies the legitimisation by the media of migrant types. It can be said that the discursive construct of the MENAS falls into the category of "threatening social figure" that is moulded as a prototype of the "European anti-subject" (Santamaría, 2002).

2. Material and methods

To carry out the research, a database was created, containing all the journalistic articles published between January 1, 2017 and October 1, 2019 by the newspapers ABC, El País, El Mundo and La

Vanguardia in which reference is made to "foreign minors". These four periodicals were chosen because they are the generalist newspapers with the largest number of readers according to the General Media Study of the year 2019 and because they allow a minimal representation of the progressive and conservative ideological spectrum (Martínez-Nicolás et al., 2014). This research conceives the progressive press as following an editorial line related to secular, cosmopolitan and egalitarian values, while the conservative one is closer to religious values, centred on the nation-state and individual freedom. The timescale considered the increase in the number of unaccompanied migrant minors in 2017 and ends on October 1, 2019 as the period prior to the campaign –and pre-campaign– of the general elections on November 10, thus avoiding skewing of the results –and the consequent impossibility of comparison with the previous period– that the introduction of the issue studied into the electoral agenda could lead to.

The journalistic articles were compiled –except in the case of El País, which has its own tag for this topic–by searching in the digital newspaper archives of the newspapers for the term "foreign minors". This search yielded 651 pieces that were processed using "web scraping" techniques, which allow, through the writing of code in R language, the reading, downloading and processing of HTML files by data analysis software (in this case, R-Studio). Thus, a database was created that houses the text of the articles (news, social commentaries and reports), their title, date of publication, the newspaper they belong to and whether or not they use the category "MENA"[1]. This latter variable is of vital importance as, given the object of study, the interest of this research focuses on the 344 journalistic articles (Table 1) in which the term is used. However, this question does not mean that the remaining items are irrelevant. On the contrary, their analysis will play a key role in contrasting what was observed in the pieces in which the acronym is mentioned, that is, the characteristics of the articles in which it is mentioned, comparing them with the features of those items in which it is not mentioned.

Through data scraping or text mining, different content analyses have been carried out, among which the observation of word usage frequencies and the construction of correlation networks between them are noteworthy. Beyond the ability to process large volumes of information[2], this technique has the main advantage of allowing the use of algorithms that automatically process the corpus of documents, which significantly reduces the likelihood of researchers introducing their own biases in the process. Furthermore, as the processing and analysis operations were carried out using the R programming language, all of them have been recorded in "scripts"[3] that can be reviewed and executed by other researchers in order to verify the outcomes obtained.

Table 1. Inclusion or omission of the term «MENA» by newspaper

	Includes		Omits	
ABC	69	62%	43	38%
El Mundo	89	61%	57	39%
El País	68	45%	84	55%
La Vanguardia	118	49%	123	51%
SUBTOTAL	344	53%	307	47%
TOTAL	651 informative articles			

Resorting to data mining techniques to carry out a content analysis does not mean giving up the explanatory level of the analysis introduced by the researcher's interpretation. The techniques mentioned allow us to delve into the "informational use of discourse" (Gutiérrez-Brito, 2010: 254), but this does not imply that the analysis should be restricted to what is merely descriptive. The techniques used generate rigorous outputs, which must be interpreted by the researchers, allowing the analysis to move towards the explanatory level of the discourses studied.

2.1. Word frequency: tf and tf-idf

To observe whether different discourses can be seen within the corpus of documents studied, as well as to determine which words would make up these discourses, we first resorted to analysing the "term frequency" (tf), that is, the frequency with which the different words appear in the corpus according to different variables. Using tf allows us to observe which words are the most used by each newspaper, or determine whether different words are used in the articles in which the "MENA" category is mentioned. The tf is complemented by *"inverse document frequency"* (idf), formulated as follows:

$$\text{idf(term)} = \ln\left(\frac{n_{\text{groups}}}{n_{\text{groups containing the term}}}\right)$$

The idf allows us to reduce the weight that is given to the words most used –present in a large part of the groups created– and increase the weight that is given to those that seem more specific to each group (Silge & Robinson, 2019). Thus, tf and idf are combined (multiplying both quantities) in the tf-idf of a term, which expresses the frequency of an adjusted category based on how common or exceptional its use is within the "corpus" (ibíd.). Consequently, tf-idf helps find the most specific terms of a discourse and, therefore, those that distinguish it from other discourses.

In the current research, tf and tf-idf was used to try to find differences between the discourses formed by the news from one newspaper and others, as well as to observe whether in the articles in which the acronym «MENA» is used, words different from those in the articles in which it does not appear are used.

2.2. Networks of correlations between words

The construction of correlation networks allows the visualisation of relationships between words based on their tendency to appear together within the same article (Silge & Robinson, 2019). Taking the words that make up the corpus of documents as a unit of analysis, their degree of correlation with other words within the same article was studied. To measure this correlation, the correlation coefficient phi (ϕ) between all the words in the corpus was used, calculated for any pair of words X and Y by the following formula:

All these correlations can be represented graphically by Markov chains, as networks of correlations between words. This way, an immense network can be built, consisting of all the words in the corpus in which the intensity of the links will vary depending on the phi between the words connected.

$$\phi = \frac{n_{11}n_{00} - n_{10}n_{01}}{\sqrt{n_1 n_0 n_0 n_1}}$$

n_{00}: number of documents where neither X nor Y appear
n_{11}: number of documents where both X and Y appear
n_{10}: number of documents where X appear without Y
n_{01}: number of documents where Y appear without X

Filtering this network by the most frequent words[4] and keeping only those moderate or higher correlations ($\phi \geq 0.3$) will allow us to discover networks of words that are relevant in the corpus and that are interconnected. So, by analysing the correlations between words, clusters of terms present in the corpus are discovered. (Silge & Robinson, 2019). In this way, different networks can be discovered and, therefore, different discourses present within the corpus of documents. The main advantage of this application of content analysis is that cluster discovery replaces the category construction present in traditional content analyses (Piñuel-Raigada, 2002), which removes the main source of arbitrariness and possible biases from the analytical process.

3. Analysis and results

3.1. Temporal evolution of publications

If we observe the evolution of the articles in which the term «MENA» is used over time, it can be seen that, regardless of the medium, it was barely mentioned by a handful of news items during 2017 (Table 2).

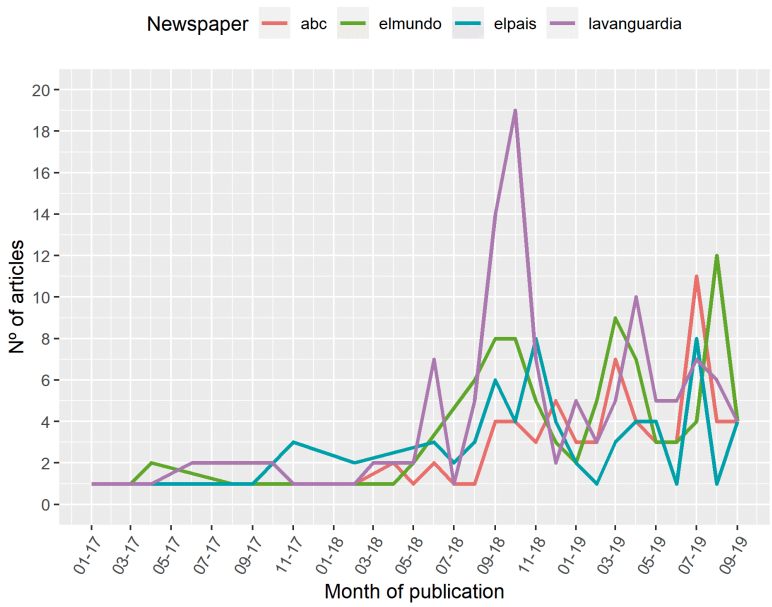
Table 2. Articles by newspaper and year

Year	ABC	El Mundo	El País	La Vanguardia	TOTAL
2017	3	7	8	8	26
2018	24	33	32	60	149
2019	42	49	28	50	169
TOTAL	69	89	68	118	344

However, this amount grew substantially in 2018 and continued to grow a little more for ABC and El Mundo during 2019, while it decreased slightly in El País and La Vanguardia. However, it should be borne in mind that only the first nine months of 2019 are included, so that year stands out above the previous ones for which the full 12 months were compiled. Based on the number of articles published per month

(Figure 1), the growing trend described can be confirmed, as well as highlighting that, since August 2018, there has not been a single month in which at least one of the four media has not published an article in which the acronym is mentioned. The peak of information from La Vanguardia between August and November 2018 was due to the difficulty of the care system for children and teenagers in Catalonia in responding to the arrival of more than 2000 minors from Morocco, which caused a collapse in shelters during the weeks after that summer.

Figure 1. Articles in which the term «MENA» is mentioned



3.2. Term frequency

In the four media outlets, the highest frequency words reference the description of the MENA acronym without expressly mentioning the term ("minors" is the word most frequently used in the media and the terms "foreigners" and "(un)accompanied" occupy positions between the second and sixth most frequently used in all cases) except for the newspaper ABC, which uses the MENA acronym more than the descriptors. However, the most relevant finding in the tf studied is the similarity present among the media. Notably, for example, if we observe the twenty-one words most used by each media outlet (those with a tf greater than 0.002) there are only one to three that are only among the most used by one medium and not by the rest[5]. Also taking into account the categories with the highest tf, slight differences are observed between the articles in which the MENA category is mentioned compared to those in which it is not cited. Therefore, a certain discursive convergence and affinity can be seen in the language used by the media, although the inclusion or omission of the acronym marks the path of the informative frame.

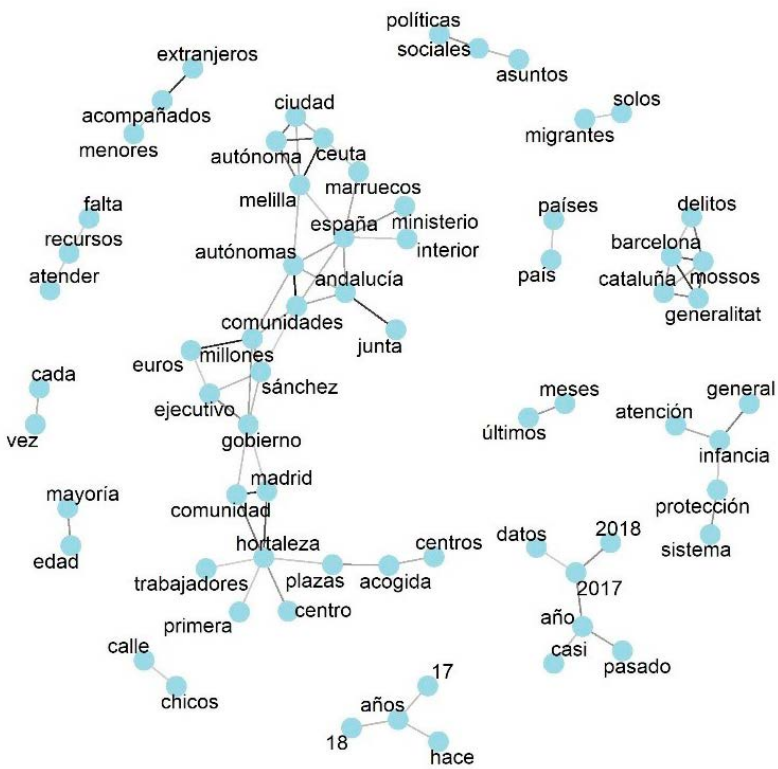
Although the tf-idf analysis should highlight words that distinguish different groups of documents, the tf-idf obtained were extremely low, and those terms with a slightly higher value than the others have a very low tf, so they cannot be considered relevant within the news corpus. For example, the word with the highest tf-idf is «Lanzarote», which appears only in the articles in which the MENA category is not mentioned, but its tf-idf is 0.0001288 and its tf is 0.0001858. Both the study of the tf and of the tf-idf seem to indicate a degree of uniformity in the discourse present throughout the corpus studied. This would not allow us, a priori, to talk about different discourses depending on the appearance of the term "MENA" in the article. But Table 1 does clearly reflect that ABC and El Mundo more frequently include the MENA acronym every time they discuss foreign minors. However, it should be borne in mind that the words used by a discourse are only one of its constituent elements. The way in which these categories are related is

another of the relevant dimensions of the discourse and, as will be seen below, exploring their relationships will allow us to appreciate different discursive axes present within the corpus.

3.3. Correlation network

Figure 2 shows the correlations between the 150 terms most frequently found in the articles in which the MENA category is used. Different clusters of different sizes can be seen in the figure, including the largest, which occupies a central position in the representation. This cluster shows the existence of an important number of terms that tend to appear related in the different articles in the form of two discursive lines. On the one hand, a geographical axis that traces the migratory route. This line links Morocco with the autonomous cities of Ceuta and Melilla, the community of Andalusia (entry points for migration) and ends in the Community of Madrid, with a specific protection centre (Hortaleza). The second axis articulates the different public institutions responsible, including the Andalusian Government, the Ministry of the Interior, Spain's president, Pedro Sánchez, and the resources necessary for care ("millions of euros", "reception centres", "workers" and "places").

Figure 2. Network of correlations* in articles using the term «MENA»



Note. Translation of correlations: Extranjeros: foreigners; Acompañados: accompanied; Menores: minors; Ciudad: city; España: Spain; Marruecos: Morocco; Gobierno: government; Ministro: minister; Comunidad autónoma: administrative region; Centros: centers; Plazas: places; Junta: board; Trabajadores: workers; Acogida: reception; Delitos: crimes; Generalitat: Catalonia Government; Mossos: Catalonian police; Cataluña: Catalonia; Falta: missing; Recursos: resources; Atender: to care; Migrantes solos: migrants alone; Últimos meses: last months.

The small clusters are grouped into three sets: in the first set there are three nodes on public policies, the child protection system and the lack of resources for care. The second set groups four nodes that characterise the population in question: boys "17 and 18 years old", in "the street", who are "single migrants" and "unaccompanied foreigners". The last set consists of only one very significant node, as it cites "crimes", "mossos" (Catalonian police force), "Generalitat", "Barcelona" and "Catalonia".

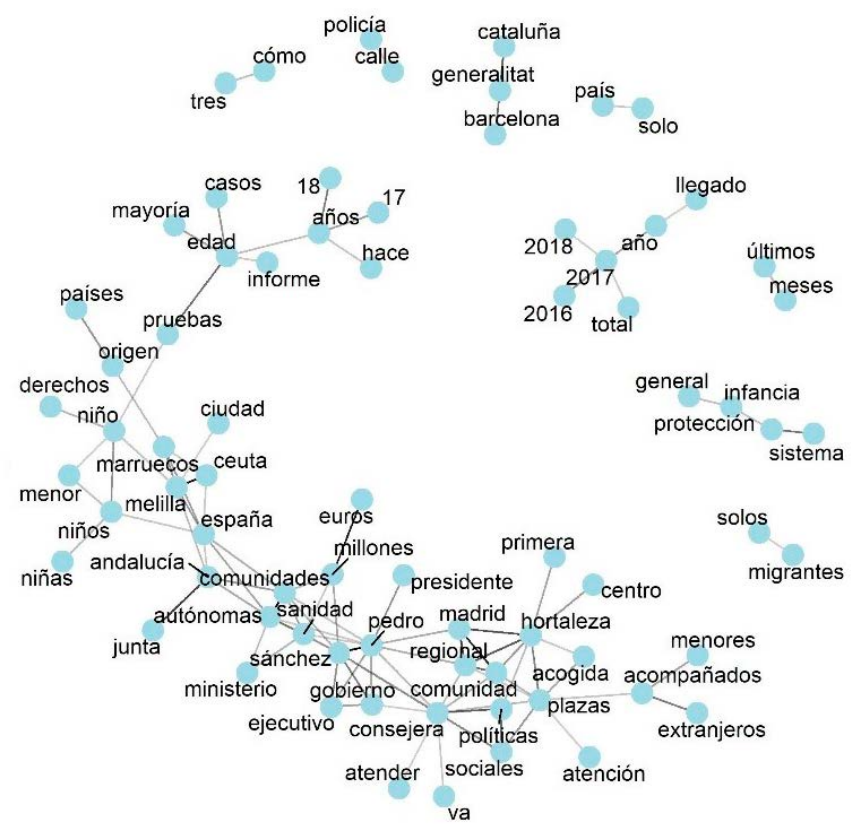
The appearance of the word "crimes" in news items about migrant minors is, by itself, a relevant fact that suggests the presence of a securitising and criminalising discourse. It is even more significant to note

that the word "crimes" does not appear within the word network in which the MENA acronym does not appear (Figure 3).

The first cluster observed (Figure 2) contrasts with the one that does not use the acronym. As Figure 3 shows, the cluster that includes the cited terms is also the main cluster, but this one is larger and more compact. In other words, it integrates more categories linked by a greater number of relationships. This difference in size between one cluster and another is due, as can be seen, to the fact that the one in Figure 3 includes elements that are also present in Figure 2 but are not related to the main discourse, such as reference to the ages, social policies or the status of unaccompanied minors of the subjects.

It can be seen, therefore, that in the articles in which the MENA acronym is mentioned, there is a main discourse accompanied by secondary discourses, whereas when it does not appear, the principal discourse is more compact and integrates elements that were scattered in the previous case.

Figure 3. Network of correlations* in articles NOT using the term «MENA»



*Note. Correlations with a phi coefficient> 0.3 found among the 150 most mentioned words.
Translation: Años: years; Derechos: rights; Niños: children; Mayoría edad: legal age; Sanidad: health system; Atención: care; Políticas sociales: social policies; Ciudad: City; Países: Countries; Pruebas: Tests; Informe: Report; Origen: Origin; Consejera: Counsellor; Junta: board; Comunidad autónoma: administrative region; Ejecutivo: executive; Presidente: President; Hortaleza: proper name of a reception center; Sistema general de protección a la infancia: general system of child protection.

In the smaller scattered clusters, words that refer to the situational status of minors ("alone", unaccompanied, without care resources, minors, "street"), their foreignness ("migrants", "countries", "foreigners") and, in the case of Barcelona, terms that criminalise them ("mossos" and "crimes") stand out. By relating the small clusters, it can be inferred, therefore, that these subjects are foreign minors and migrants, alone, without care or company, who come from other countries, who are on the street and who are monitored by the police anticipating the perpetration of crimes. In this way, there is a discursive spectrum of the Spanish newspapers analysed that point to several informative frames regarding

this population: state-nationalist, because they emphasise their status as foreigners; protector-assistance, because they highlight their loneliness and neglect; moral-adult-centric, because they highlight their minority of age and their location on the street; securitising-criminalising, because they invoke the security forces and crimes.

4. Discussion and conclusions

The study has verified the progressive increase in the number of articles in the Spanish press concerning adolescents who migrate alone to Spain between 2017 and 2019. Likewise, there are no substantial differences in the informational framing of the four media outlets, although the word frequencies suggest incipient trends whereby the media emphasise certain social, partisan, police or welfare concepts. The conservative press more frequently includes the MENA acronym every time it discusses foreign minors. Similarly, the study by Boeva (2016) found that conservative newspapers tend to resort to the legal category more frequently than liberal ones and portray refugees in a more negative light.

The way information on foreign teenagers is framed is determined by the inclusion or omission of the acronym MENA. Articles citing foreign minors –without making reference to the acronym– delimit a semantic field characterised by a greater geographical contextualisation, by a human, personal and, sometimes, humanitarian and assistance-oriented outlook, than those articles that include the acronym. The second block of articles is characterised by an approach linked to threat, security, moral disapproval and political intervention. The word MENA describes a homogeneous collective with gregarious behaviour patterns and few contextual and subjective nuances.

Both views emphasise the adult, national and moral condition of the frame. In addition, there is also an emphasis on the solitude of minors, as omissions are appreciated in family networks and the embryonic support and reception networks of which they are part. The articles omit and silence the complexity of migratory processes and transnational social relations.

The work of the IOÉ Collective (1995) on Spanish discourses regarding foreigners identified nationalist, cosmopolitan, racist, ethnocentric, universalist, egalitarian and socially-committed standpoints. Our research identified informative frames close to the discursive positions of protectionist nationalism, ethnocentrism and solidarity, but did not identify the other discursive spectra.

Regarding the different approaches of the conservative and progressive press, the study by Boeva (2016) found that most articles in the Daily Mail, The Guardian, FOX News and ABC News on refugees were related to their nationality or country of origin. Nevertheless, as in our study, Boeva's found no noticeable difference between conservative and liberal newspapers. It concluded that refugees are represented as "needy" rather than as "threats", although in our work we observed that the two representations are associated with the inclusion or omission of the MENA acronym.

Our research coincides with other studies (Horsti, 2003; Checa-Olmos & Arjona-Garrido, 2011) in which the pejorative image of immigrants and the dichotomous visions that separate the "good" from the "bad" hold sway. However, we found specific elements of the Spanish context, at the end of the second decade of the 21st century, that reveal a growing ideological polarisation that cuts across political, social and media organisations. This trend accentuates the simplification of perceptions and interpretations of the studied population.

Although the method employed has strengths based on the quantity, breadth and heterogeneity of journalistic information, the empirical material for an in-depth study of the structure of latent psychosocial images and representations in the Spanish press was insufficient. The analysis enables the description of the discursive morphology of the press, but the relationships of meanings are still incipient. It would be convenient to complement this analysis with other studies that analyse and interpret opinion polls on minors who migrate alone. There is a need to continue with the exploration of findings related to the adult-centric and nationalistic news frames of the other print media, as well as the audiovisual media with the highest audience penetration.

Notes

[1] "MENA" is understood as the presence in the body of the article of one of the following words: mena, menas, MENA, MENAS, M.E.N.A or M.E.N.A.S.

[2]In this research, 192,315 words were processed, each constituting an observation and, therefore, a whole column in the database.
[3]In this case, available at:https://bit.ly/3f0j0ts.
[4]For the correlation networks to be graphically representable, the research considers the correlations between the 150 words most frequently used within the group of documents studied.
[5]"El País" is the only medium that has among its most used terms: "social", "Generalitat", "migrants"; "El Mundo": "PP" and "city"; "ABC": "police" and "La Vanguardia": "places".

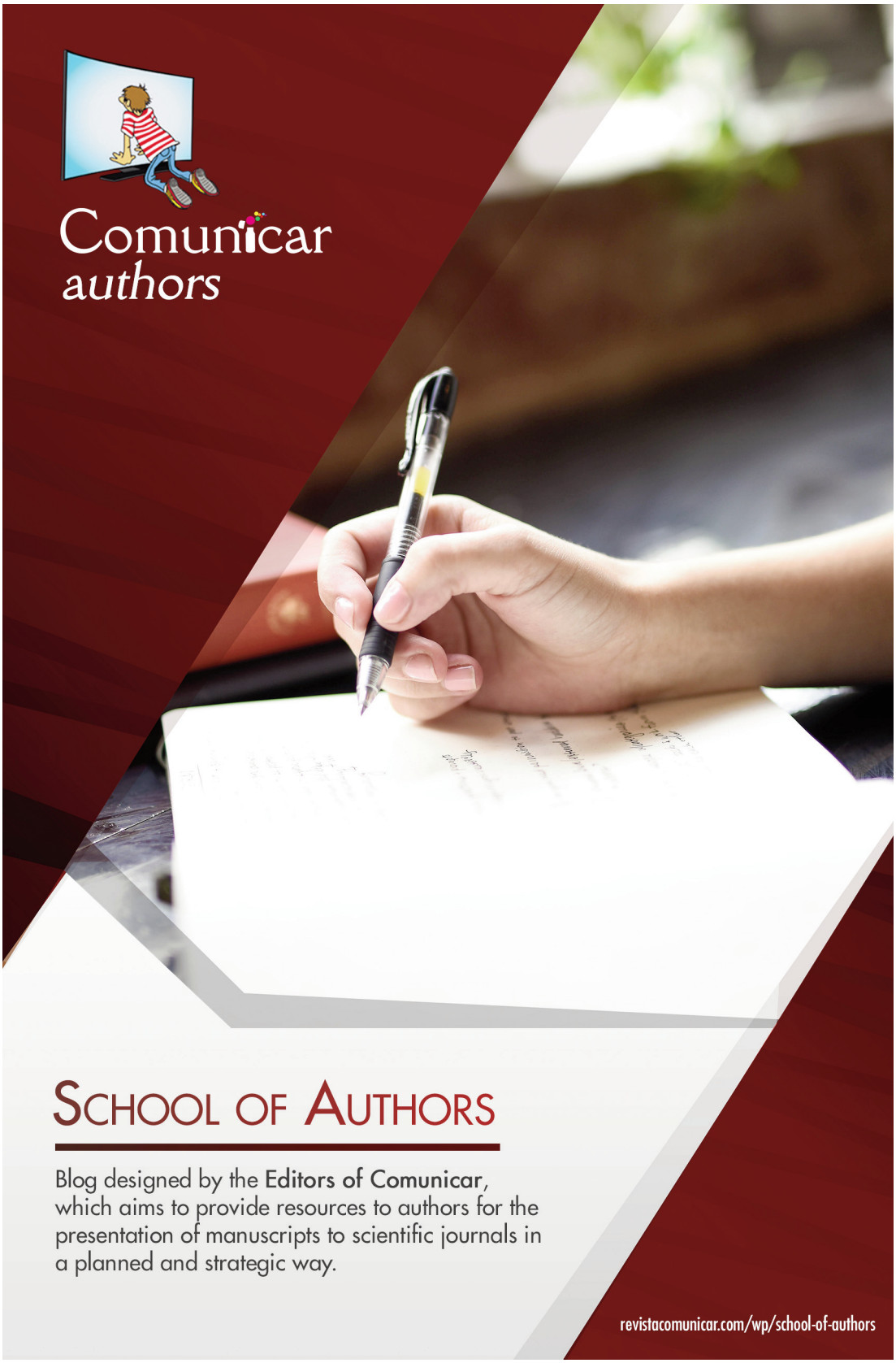
Funding Agency

R+D Project "Unaccompanied Migrant Minors in Spain. Current situation, care circuit and social and educational intervention model for inclusion", Ministry of Science, Innovation and Universities, PGC2018-100944-B-I00; by the GESES Research Group of the Department of Psychology and Sociology of the University of Zaragoza and of the Sociology Department of the University of Burgos.

References

Andersson, R. (2014). Time and the migrant other: European border controls and the temporal economics of illegality. *American Anthropologist*, *116*(4), 795-809. https://doi.org/10.1111/aman.12148
Balzacq, T. (2005). The three faces of securitization: political agency, audience and context. *European Journal of International Relations*, *11*(2), 171-201. https://doi.org/10.1177/1354066105052960
Benson, R. (2013). *Shaping immigration news: A French-American comparison*. Cambridge University Press. https://doi.org/10.1017/CBO9781139034326
Bhabha, J., Kanics, J., & Senovilla, H.D. (2018). *Research handbook on child migration*. Elgar. https://doi.org/10.4337/9781786433701.00007
Bleich, E., Bloemraad, I., & de Graauw, E. (2015). Migrants, minorities and the media: Information, representations and participation in the public sphere. *Journal of Ethnic and Migration Studies*, *41*(6), 857-873. https://doi.org/10.1080/1369183x.2014.1002197
Boeva, A. (2016). Discursive construction of refugees, migrants and asylum seekers in British and American news sources. *Procedia - Social and Behavioral Sciences*, *236*, 53-58. https://doi.org/10.1016/j.sbspro.2016.12.018
Bourbeau, P. (2011). *The securitization of migration: A study of movement and order*. Routledge. https://doi.org/10.4324/9780203829349
Buzan, B. (2007). *People, states and fear: And agenda for international security studies in the post-cold war era*. ECPR. https://bit.ly/2YYvMDq
Checa-Olmos, J., & Arjona-Garrido, A. (2011). Spaniards' perspective of immigration. The role of the media. [Españoles ante la inmigración: El papel de los medios de comunicación]. *Comunicar*, *37*, 141-149. https://doi.org/10.3916/c37-2011-03-06
Colectivo IOÉ (Ed.) (1995). *Discursos de los españoles sobre los extranjeros Paradojas de la alteridad*. Centro de Estudios Políticos y Constitucionales. https://bit.ly/3gsXo9k
Dines, N., Montagna, N., & Ruggiero, V. (2015). Thinking Lampedusa: Border construction, the spectacle of bare life and the productivity of migrants. *Ethnic and Racial Studies*, *38*(3), 430-445. https://doi.org/10.1080/01419870.2014.936892
Doménech, E. (2013). Las migraciones son como el agua: Hacia la instauración de políticas de «control con rostro humano». La gobernabilidad migratoria en la Argentina. *Polis*, *12*(35), 1-21. https://doi.org/10.4067/s0718-65682013000200006
Doná, G., & Veale, A. (2011). Divergent discourses, children and forced migration. *Journal of Ethnic and Migration Studies*, *37*(8), 1273-1289. https://doi.org/10.1080/1369183x.2011.590929
Eberl, J.M., Meltzer, C.E., Heidenreich, T., Herrero, B., Theorin, N., Lind, F., Berganza, R., Boomgaarden, H.G., Schemer, C., & Strömbäck, J. (2018). The European media discourse on immigration and its effects: A literature review. *Annals of the International Communication Association*, *42*(3), 207-223. https://doi.org/10.1080/23808985.2018.1497452
Fiscalía General del Estado (Ed.) (2020). *Memoria del año 2019*. Imprenta Nacional de la Agencia Estatal Boletín Oficial del Estado. https://bit.ly/2VKtxBk
Gimeno, C. (2013). El orden y la gente: Los menores migrantes no acompañados. In *Negociaciones identitarias* (pp. 25-36). Commonground Publishing. https://bit.ly/30m8EOH
Gimeno, C. (2018). Retos de la acogida residencial a menores que migran solos: hacia un trabajo social transnacional. *Cuadernos de Trabajo Social*, *31*(1), 95-108. https://doi.org/10.5209/CUTS.56005
Giovannetti, M. (2016). *I comuni e le politiche di accoglienza dei minori stranieri non accompagnati*. Cittalia - ANCI. https://bit.ly/2NQh4rI
Gutiérrez-Brito, J. (2010). Introducción a la lógica del análisis del discurso. In G. J. Callejo (Ed.), *Introducción a las técnicas de investigación social* (pp. 245-264). Ramón Areces. https://bit.ly/2VFqBpR
Hoekstra, M. (2015). Diverse cities and good citizenship: How local governments in the Netherlands recast national integration discourse. *Ethnic and Racial Studies*, *38*(10), 1798-1814. https://doi.org/10.1080/01419870.2015.1015585
Horsti, K. (2003). Global mobility and the media. *Nordicom Review*, *24*(1), 41-54. https://doi.org/10.1515/nor-2017-0296
Horsti, K. (2012). Humanitarian discourse legitimating migration control: FRONTEX public communication. In M. Messer, R. Schroeder, & R. Wodak (Eds.), *Migrations: Interdisciplinary perspectives* (pp. 297-308). Springer. https://doi.org/10.1007/978-3-7091-0950-2_27
Knezevic, Z. (2017). Amoral, im/moral and dis/loyal: Children's moral status in child welfare. *Childhood*, *24*(4), 470-484. https://doi.org/10.1177/0907568217711742

Koziner, N. (2013). Antecedentes y fundamentos de la teoría del framing en comunicación. *Austral Comunicación*, *2*(1), 1-25. https://doi.org/10.26422/aucom.2013.0201.koz
Llorent-Bedmar, V. (2012). The educational role of the digital media in the integration of immigrants in Spain: El mundo.es and El pais.com. [El papel educativo de la prensa digital ante la integración de los inmigrantes en España: El mundo.es y El pais.com]. *Comunicar*, *38*, 139-146. https://doi.org/10.3916/C38-2012-03-05
Martínez-Nicolás, M., Humanes, M.L., & Saperas-Lapiedra, E. (1980). La mediatización de la política en el periodismo español. Análisis longitudinal de la información política en la prensa de referencia. *Trípodos*, (34), 41-59. https://bit.ly/3aNRqN2
Mateo, J.L. (2017). *«Moros vienen». Historia y política de un estereotipo*. Instituto de las Culturas. https://bit.ly/38p1ixg
Menjívar, C., & Perreira, K.M. (2019). Undocumented and unaccompanied: Children of migration in the European Union and the United States. *Journal of Ethnic and Migration Studies*, *45*(2), 197-217. https://doi.org/10.1080/1369183x.2017.1404255
Miller, J. (2006). Who's telling the News? Racial representation among news gatherers in Canada's Daily Newsrooms. *International Journal of Diversity in Organisations, Communities and Nations*, *5*(4), 133-142. https://doi.org/10.18848/1447-9532/cgp/v05i04/39084
Perelló, M., & Lacomba, J. (2020). Las organizaciones de la sociedad civil en fronteras de alta migración. Entre el humanitarismo y la defensa de derechos. *REMHU*, *28*(58), 13-32. https://doi.org/10.1590/1980-85852503880005802
Peris, L.F. (2015). *La tutela trasnazionale condivisa come superiore interesse dei minori stranieri non accompagnati con vincoli familiari*. [Doctoral dissertation]. Sapienza Universitá di Roma. https://bit.ly/3hbmDxn
Piñuel-Raigada, J.L. (2002). Epistemología, metodología y técnicas del análisis de contenido. *Estudios de Sociolingüística*, *3*(1), 1-42. https://bit.ly/2SicmFL
Quiroga, V. (2010). *Sueños de bolsillo. Menores migrantes no acompañados/as en España*. Unicef-Banesto. https://bit.ly/2VKSdda
Rigoni, I., & Saitta, E. (2012). *Mediating cultural diversity in a globalised public space*. Palgrave Macmillan. https://doi.org/10.1057/9781137283405
Rosen, R., & Crafter, S. (2018). Media Representations of separated child migrants: From dubs to doubt. *Migration and Society*, *1*(1), 66-81. https://doi.org/10.3167/arms.2018.010107
Santamaría, E. (2002). *La incógnita del extraño: Una aproximación a la significación sociológica de la inmigración no comunitaria*. Anthropos Editorial. https://doi.org/10.5565/rev/athenead/v1n1.40
Save the Children (Ed.) (2018). *Los más solos*. Save the Children España. https://bit.ly/2NWsoCK
Sigona, N., Chase, E., & Humphris, R. (2017). *Protecting the best interests of the child in transition to adulthood. Becoming Adult Research Brief*. UCL. https://bit.ly/2VbYO0y
Silge, J., & Robinson, D. (2019). *Text mining with R: A tidy approach*. O´Reilly. https://bit.ly/2ST4UjS
Suárez, L. (2004). Niños entre fronteras: Migración de menores no acompañados en el Mediterráneo occidental. *Migración y Desarrollo*, *2*, 35-48. https://doi.org/10.35533/myd.0202.lsn
Terwal, J. (1996). The social representation of immigrants: The Pantanella issue in the pages of 'La Repubblica'. *Journal of Ethnic and Migration Studies*, *22*(1), 39-66. https://doi.org/10.1080/1369183x.1996.9976521
Thorbjørnsrud, K., & Figenschou, T.U. (2016). Do marginalized sources matter? *Journalism Studies*, *17*(3), 337-355. https://doi.org/10.1080/1461670x.2014.987549
Ticktin, M. (2015). Los problemas de las fronteras humanitarias. *Revista de Dialectología y Tradiciones Populares*, *70*(2), 291-297. https://doi.org/10.3989/rdtp.2015.02.001.03
Van-Dijk, T.A. (2005). Nuevo racismo y noticias. In *Inmigración, género y espacios urbanos: Los retos de la diversidad* (pp. 33-55). Bellaterra. https://bit.ly/3f4QTd1
Van-Gorp, B. (2005). Where is the frame? Victims and intruders in the Belgian press coverage of the asylum issue. *European Journal of Communication*, *20*(4), 484-507. https://doi.org/10.1177/0267323105058253
Velasco, J.C. (2016). Open-Border immigration policy: A step towards global justice. *Migraciones Internacionales*, *8*, 41-72. https://bit.ly/3jgvGiE
Vickers, T., & Rutter, A. (2018). Disposable labour, passive victim, active threat: Migrant/non-migrant othering in three British television documentaries. *European Journal of Cultural Studies*, *21*(4), 486-501. https://doi.org/10.1177/1367549416682968


Comunicar
authors
SCHOOL OF AUTHORS
Blog designed by the Editors of Comunicar, which aims to provide resources to authors for the presentation of manuscripts to scientific journals in a planned and strategic way.
revistacomunicar.com/wp/school-of-authors

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Meta-reflexivity for resilience against disinformation

Meta-reflexividad para la resiliencia contra la desinformación

Dr. Tea Golob. Associate Professor, Head of the Institute for Media Platforms, Faculty of Information Studies, Novo Mesto (Slovenia) (tea.golob@fuds.si) (https://orcid.org/0000-0003-4314-3231)
Dr. Matej Makarovi . Professor, Head of Department for Applied Social Studies, School of Advanced Social Studies, Nova Gorica (Slovenia) (matej.makarovic@fuds.si) (https://orcid.org/0000-0001-8193-4232)
Dr. Mateja Rek. Professor, Head of Media Literacy Program, Faculty of Media, Ljubljana (Slovenia) (teja.rek@fame.si) (https://orcid.org/0000-0003-0928-1163)

ABSTRACT

The rise of digital media contributes to fake news and disinformation being circulated on a larger scale and pace. The central aim of the work is to consider the potentials of individuals to actively respond to disinformation and fake news. In that regard, the authors rely on Archer's theoretical framework of reflexivity and its modes. It is argued that a specific mode of reflexivity, namely meta-reflexivity, can enable people to take a critical distance towards media messaging. The method involves the Reflexivity Measurement Tool (RMT) to provide an approximate assessment of one's reflexivity in terms of quantitative scores. The survey has been conducted in Slovenia on a representative national sample and path analysis is applied to identify the relationship between demographic features, media exposure, reflexivity and fact-checking. The results show how age and education affect media preferences, in terms of how frequently an individual is exposed to a particular type of media. Younger people, women and persons with tertiary education are more meta-reflexive, which contributes to their active response to disinformation. It is concluded that meta-reflexivity is essential but not sufficient to produce an active response of individuals to disinformation. Need for professional fact-checking-services and media education is discussed.

RESUMEN

El avance digital contribuye a que las noticias falsas y la desinformación aumenten en número y ritmo. El objetivo central de este trabajo es considerar el poder de las personas para responder activamente a la desinformación y noticias falsas. Para ello, los autores se basan en Archer, específicamente su propuesta teórica relacionada con la reflexividad y sus modos. Argumentamos que un modo específico de reflexividad, la meta-reflexividad, permite distanciarse críticamente de los mensajes de los medios de comunicación. El método consiste en el uso de la Herramienta de Medición de la Reflexividad (HMR) para proporcionar una evaluación aproximada de la propia reflexividad en términos de puntuaciones cuantitativas. La encuesta se ha realizado en Eslovenia sobre una muestra nacional representativa y se ha aplicado un análisis de la trayectoria para determinar la relación entre las características demográficas, la exposición a los medios de comunicación, la reflexividad y la verificación de los hechos. Los resultados muestran que la edad y la educación afectan las preferencias relacionadas con los medios, medidos en base a la frecuencia de exposición a un tipo particular de medio. Los jóvenes, las mujeres y las personas con educación terciaria son más meta-reflexivos, lo cual contribuye a que tengan una respuesta activa a la desinformación. Se concluye que la meta-reflexividad es necesaria pero no suficiente para producir una respuesta activa de los sujetos a los mensajes de los medios de comunicación. Finalmente se menciona la necesidad de tener servicios profesionales de verificación, además de programas de educación mediática.

KEYWORDS | PALABRAS CLAVE

Media literacy, reflexivity, critical thinking, fake news, disinformation, fact-checking.
Alfabetización mediática, reflexividad, pensamiento crítico, noticias falsas, desinformación, verificación.

Received: 2020-03-30 | Reviewed: 2020-04-21 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-09 | Pages: 103-112

1. Introduction

In this article, we address the increasing complexity of media communication and the ability of audiences to comprehend information in the context of the unprecedented rise of ICT development. The digital revolution has thrust us into an immense flow of information pervading all facets of our everyday lives. Surrounded by incomprehensible loads of news, images, and opinions streaming through various interconnected devices, such as tablets, smartphones, computers, and televisions, we have all been immersed in mass media abundance.

In that regard, we must never forget that what media offer us (i.e., providing news and daily information concerning various elements of our reality) is never a direct reflection of reality but a media construction (Hall et al., 2013; Strutt, 2019). News media messages and representations are reductionist in comparison to the actual reality. They can be simplified or distorted versions of reality or they can simply be wrong, fake, or even intentionally misleading. The issue of their accuracy seems to be particularly crucial in the case of news reporting, which have the purpose of carrying out an informative or interpretative function and having a guiding principle of objectivity. Their ideal mission can be, however, often called under question. One can hardly overlook the debates provoked by the impact of media on voting results in presidential elections in the US, and in the UK's Brexit referendum (Goering & Thomas, 2018).

The contemporary flood and pervasiveness of information, have accelerated the influence of the «dark side» of the media landscape referring to the current rise of fake news and disinformation. The latter media messages are, however, not a new phenomenon. A walk through the history of propaganda (Barclay, 2018; Taylor, 2003) and through the psychology of lies (DePaulo, 2018) clearly reveals that having power over the flow of messages and controlling their content are inherent parts of mass communication processes. While deliberate manipulation, censorship, and lies are commonly regarded as unethical and harmful, they are still (too) often deployed in the media landscape. Due to dependence of credibility assessment processes of news shared online on the strength of social ties between the sharer of the item and its recipient (Samuel-Arzan & Hayat, 2019), the issue of fake news and disinformation has put digital journalism and media credibility even more at stake (Lotero-Echeverri et al., 2018). Coping with disinformation has become difficult to handle, regardless of whether fake news is planned, manipulative or even unplanned - when originating from ignorance, or from a firm, even fundamentalist beliefs.

Lazer et al. (2018) identify two categories of interventions against fake news: 1) Those aimed at empowering individuals to evaluate the fake news they encounter; 2) Structural changes aimed at preventing exposure of individuals to fake news in the first instance. Our focus is on the first category. Learning how to use media and also how to participate in dynamic processes of communication and creation processes of media messages have become a necessity and an integral part of individuals' life. Media literacy is the outcome of the media education processes of teaching and learning about media (Buckingham, 2003). It refers not just to skills enabling us to use new emerging media or create online messages, but also to understanding how media works in this changing environment and to the ability to analyse and evaluate the media content (Livingstone, 2004). Furthermore, it also highlights the necessity to comprehend the intents and consequences of media messages and ability to critically analyse multiple codes (Rivera-Rogel et al., 2017).

Critical thinking is a core element of media literacy. It is the ability of individuals to use and at the same time, autonomously and critically interpret the flow, content, values and consequences of the use of various media messages.It also enables them to participate in the creation of media messages (Martens, 2010; Martens & Hobbs, 2015). Improving critical thinking and digital media literacy has thus become of strategic importance for active citizenship (European Commission , 2018: 25). Media literacy includes cognitive, emotional and social competences, and the ability to focus on creative problem solving (Hobbs, 2010; Sonck et al., 2012; Mascheroni & Murri, 2014). It is commonly argued that critical thinking empowers digital media users to interrogate the accuracy of information and to identify dated, biased, fake, or exploitative information and their sources. It can empower them to counter unfair and inaccurate representations. It can guide them to make better-informed media choices and enable them to select intelligently, although being overwhelmed by an abundance of information and services online. While exploring individuals' capabilities for critical thinking, we link the active response to media information

to Margaret Archer's theoretical framework of reflexivity and its modes (Archer, 2007; 2012). In her opinion, contemporary society is increasingly morphogenetic, due to the mutual reinforcement of structure and culture through positive feedback (Archer, 2012). The lack of synchrony between both levels is contributing to the emerging social and cultural complexity, which is producing even more variety, making it increasingly difficult for people to comprehend it. Media are a constituent of the social environment, which has become imbued with a morphogenetic impetus. They reflect the institutional and ideational transformations and are also contributing to the tensions between the structural and cultural domains. As Archer (2012: 37) says, «to encounter news and opinions wildly at variance with those of TV family members, to explore forbidden and even to extend it and to assume one or many cyber personas, these surely beat the children's encyclopaedias that had been the baby boomer' resort for flat information».

The morphogenetic impetus, however, does not merely expand the variety of meanings to select but also encourage people to develop skills to act upon them properly. A critical role in that regard is played by reflexivity, which Archer defines as «the regular exercise of the mental ability, shared by all normal people, to consider themselves in relation to their (social) contexts and vice versa » (Archer, 2007: 4). It enables people to actively respond to the social environment, including the media landscape. Reflexivity takes place through inner dialogue, which enables people to define their concerns, develop projects and establish practices.

The media are a part of the social context, which can trigger our inner world and enhance our internal conversation. As Archer (2012) says, due to new situational contexts and their complexity, we are placed in a variety of contested material and ideational settings, which are encouraging us to determine our own role and position in society. However, it is not just reflexivity as such, which enables us to actively respond to the social environment and media, respectively, but especially its modes. They are crucial in defining how can we become an active agent and critically re-evaluate the social context in terms of being able to cope with «digital distraction» (Carrigan, 2017) provided by the flood of media information.

Based on her qualitative research insights, Archer (2007) recognised four different modes of reflexivity. The first is a communicative reflexivity, which needs a confirmation from others in order to lead to action, and it is also associated with traditional society, as it is collectivistic towards the social. The second is an autonomous reflexivity, which is self-contained and directly leads to action. It is seen as a product of modern society. The third is a meta-reflexivity resulting from late-modern condition, which enables individuals to critically evaluate previous inner dialogues and to be critical about their effective action. In addition, there is also a fractured mode, which does not lead to any purposive action and causes personal distress and disorientation.

As Archer (2012) says, there is only one mode of reflexivity that enables us to properly respond to the ever-changing, morphogenetic society, i.e. meta-reflexivity. Therefore, we argue that only that mode of reflexivity can enable us to take a critical distance towards the media content and its reporting. Meta-reflexivity is imbued with the search for the relative autonomy of the structural and the cultural domains. Those who are capable of regularly taking critical stances towards the social domain are supposed to also be more skilled in terms of media literacy. They should be more motivated to verify information available to them and to be critical towards the media content.

This has led us to propose our main research question regarding whether one's meta-reflexivity significantly contributes to one's additional checking of media content in order to strengthen resilience in the face of fake news and disinformation. Can one's reflexivity (as conceptualised by Archer) significantly contribute to responding critically to media messages and additional fact-checking of media content in order to test for fake news and disinformation? We hypothesise that someone who is predominantly meta-reflexive will also be more able to critically evaluate the media landscape.

2. Material and methods

Our research applies the Reflexivity Measurement Tool (RMT) intended to provide an approximate assessment of one's reflexivity in terms of quantitative scores for different reflexivity modes. The tool's validity and reliability have been tested in our previous qualitative and quantitative research (Golob & Makarovi , 2018) and later also applied in a national representative sample research study (Golob &

Makarovi , 2019). The first quantitative instrument to measure reflexivity was the Internal Conversation Indicator (ICONI), developed by Archer (2007) based directly on her theory and previous qualitative research. The RMT (Golob & Makarovi , 2018; 2019) applied in this research is the further adaptation of Archer's indicator, after taking into account the critical responses to the original ICONI (Meriton, 2016; Dyke et al., 2012) and the work by Porpora and Shumar (2010). Drawing from ICONI and based on the contribution by Porpora and Shumar (2010), the reflexivity level is measured through the responses to the questions asking: «During the last year, how often did you» about the following items indicating the intensity of internal conversation: plan your future; rehearse what you would say in an important conversation; imagine the best and worst consequences of a major decision; review a conversation that ended badly; clarify thoughts about some issue, person or problem (Porpora & Shumar, 2010).

The reflexivity level is thus the sum of the Likert scale responses to these five items calculated by the following formula:

$$R = r_1 + r_2 + r_3 + r_4 + r_5 \qquad (1)$$

where the values from to represent the answers to each of the five items above on the Likert scales, with each of them ranging from zero (never) to four (all the time), and *R* indicates the reflexivity level. Reflexivity level *R* as the sum of the Likert scores for all of the five items previously identified by Archer (2007), Porpora and Shumar (2010) thus ranges from zero (no reflexivity) to 20 (full reflexivity).

However, while this measurement of the intensity of persons' internal dialogues provides an indication of the reflexivity level, it tells us nothing about the reflexivity mode. It should thus be combined with an indication of a specific reflexivity mode: for the purpose of our research, this is meta-reflexivity, as we are interested in the connection between this mode and media fact-checking.

Obviously, nobody can be highly meta-reflexive without being highly reflexive: the more reflexive people are, the more intensive their meta-reflexivity can be. This should be seen as a multiplier effect: combining the intensity of internal dialogue (or the reflexivity level *R*) and the meta-reflexive way of thinking (Golob & Makarovi 2018; 2019). Using the RMT, we thus multiply each person's reflexivity level (*R*) with her/his Likert scale responses to the question: «During the last year, how often did you carefully consider the key priorities of your life and why you are doing what you are doing? » (L_{met}), ranging again from 0 (never) to 4 (all the time):

$$M_{met} = R \times L_{met} \qquad (2)$$

The value obtained through this method represents the score for the meta-reflexivity mode (M_{met}) – ranging from 0 (no meta-reflexivity) to 80 (full meta-reflexivity).

The survey sample used in our research has been drawn from the electronic version of the Slovenian national level phonebook based on random sampling, stratified in terms of all ten Slovenian statistical regions to provide proper regional representation. Eighty per cent of the sample has been drawn from a list of mobile phone users, and 20 per cent from a list of fixed-line phone users.

The survey was conducted on 5-8 March 2018 using the Computer-Aided Telephone Interviews (CATI), by trained interviewers, coordinated by Parsifal SC, LLC, a spin-off company of the School of Advanced Social Studies, Slovenia, specialised in quantitative and qualitative public opinion polls and market research. The obtained national representative sample consists of 715 adults and enables us (in terms of its size and the way it has been selected and post-stratified) to draw statistical inferences regarding the Slovenian national population.

To provide consistency within the obtained sample with the demographic structure of the general population residing in Slovenia, sampling weights were calculated using the raking method (cf. Little, 1993). Based on this, the consistency of the sample with the population was provided in terms of gender, education, settlement type, and age, using the Register-based Census 2011 of the Statistical Office of the Republic of Slovenia (2011). The demographic structure of our sample is presented in Table 1. All statistical analyses have been conducted using the Stata software (StataCorp, 2015).

Table 1. Demographic structure of the sample		
Demography	**Category**	**%**
Gender	Male	50.0
	Female	50.0
Age (mean = 49.9; std. dev. = 16.7)	18-34	22.3
	35-54	38.0
	55-	39.8
Education	Primary or less	16.8
	Vocational	24.2
	Secondary	35.6
	Tertiary	23.4

Note. Golob and Makarovič, 2019; Original survey, own calculations.

3. Results

First, we have investigated the patterns in terms of exposure to different types of media. The survey respondents were thus asked to evaluate their frequency of using particular types of media on a Likert scale ranging from 1 (never) to 5 (every day). The results presented in Table 2 indicate that TV is still by far the most popular medium, watched by more than 93% of the respondents, while 44% of them watch TV every day. Printed media, in contrast, are the least used: they are never used by more than one third of our respondents and used daily by less than 16% of the respondents. The greatest variety can be observed regarding the web media portals, with one third never using them and more than one quarter using them daily.

Table 2. Exposure to different media				
Can you please evaluate with a grade from 1 to 5 how often you follow particular media or their content, where 1 means never and 5 means every day?	**Mean**	**Standard deviation**	**% of answers 1 (never)**	**% of answers 5 (every day)**
TV	3.78	1.31	6.70	44.08
Radio	3.36	1.49	16.32	34.21
Web	2.91	1.62	33.01	26.32
Press	2.46	1.43	34.70	15.57

Note. Original survey, own calculations.

In terms of reflexivity, the survey has indicated a roughly normal distribution of reflexivity levels among the general population, with the mean reflexivity level (R) of 10.5 (on the scale from 0 to 20) and the mean meta-reflexivity score (M_{met}) of 30.8 (on the scale from 0 to 80).

In the survey questionnaire, we verified the participants' active agency in fact-checking by asking the question regarding doubt and additional checking regarding the information found in the media (see the results in Table 3). While some doubt in the media content is expressed by more than 90 per cent of the Slovenian adults, according to our survey, actually checking the content through alternative sources is less common; thus, 55 percent of Slovenian adults never look for an alternative source, even when they have doubts about the accuracy of certain information. Less than 15 percent of the survey respondents claimed that they "often doubt information found in a particular media and check it through an additional source", which can be seen as an only proper level of active agency in terms of fact-checking.

Table 3. Resilience to the fake news: fact-checking	
'How often do you doubt information found in a particular media and then check it through an additional source?'	**Percentage**
Never doubt	9.62
Sometimes doubt, never check	44.44
Sometimes doubt and check	31.28
Often doubt and check	14.66
Total	100.00

Note. Original survey, own calculations.

Based on our central research question, we proceeded to check the impact of meta-reflexivity on fact-checking, specifically to often being in doubt and checking media information through an additional source. While doing this, however, we also controlled for the effects of other potential factors, namely:

1) Individuals' demographic features that also reflect their structural positions, opportunities, and deprivations in terms of gender, educational level, and age.

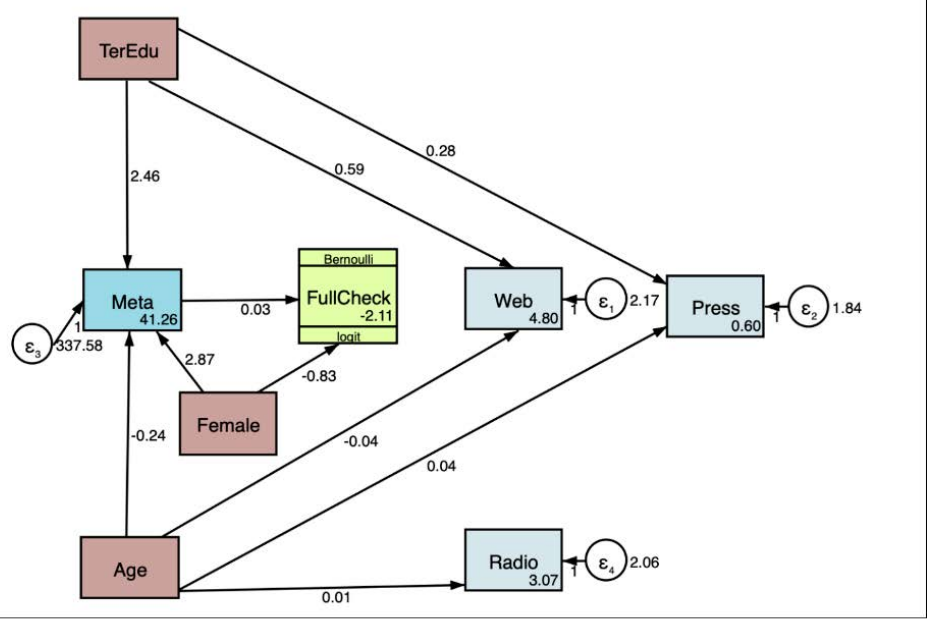
2) The extent to which the individuals are exposed to a particular type of media, namely TV, radio, daily press, and online sources (all on the scale from 1 to 5).

In addition, we need to consider the potential effects of the demographic features to the media preferences as well as the potential effects of gender, age, and education to meta-reflexivity already highlighted in the previous studies (Caetano, 2015; Akram & Hogan, 2015; Golob & Makarovi , 2019).

This implies the need for an explanatory statistical model that involves not only independent and dependent variables in terms of regression, but a more complex model that also involves a set of potential intervening variables between the exogenous demographic variables and the dependent binary variable, distinguishing those who often doubt and check the media information from the rest. Our study is thus conducted in terms of path analysis with the logit link to the final (binary) dependent variable, approximately indicating the proper level of active agency in terms of frequent doubt and fact-checking of media information (variable FullCheck).

Our final path analysis model, presented in Figure 1, only includes those relations between the variables (in terms of (non-standardised) coefficients) that have turned out to be statistically significant.

Figure 1. The path analysis model of the factors affecting frequent doubt and fact-checking in the media



Note. Original survey, own calculations.

First, we should mention the effects of structural positions in terms of gender (dichotomous variable Female), tertiary education (dichotomous variable TerEdu) and age (variable Age) to individuals' meta-reflexivity, which is consistent with the findings from previous research (Golob & Makarovi , 2019). While meta-reflexivity decreases with age, with the younger generations being more meta-reflexive, it is higher among women and those with tertiary education.

Age and education also affect media preferences, in terms of how frequently an individual is exposed to a particular type of media. The older people are, the more likely they are to listen to the radio and read the daily press, and the less likely they are to use the online sources. Moreover, people with tertiary education use both the daily press and the web-based media more often, even when controlling for their age. TV, in contrast, seems to be a "universal" medium, unaffected by age, educational level, or gender.

When it comes to the factors directly affecting frequent checking media information through other sources, an important finding is which factors *cannot* be confirmed in statistical terms. The media type

turns out to be irrelevant in this regard: the frequency of using a particular media type has no statistically demonstratable effects on checking the accuracy of information in the media. More interestingly, even tertiary education as such has no direct effect on it. Instead of affecting fact-checking in the media directly, tertiary education only functions indirectly, through higher meta-reflexivity: persons with tertiary education are more likely to be meta-reflexive, and persons with higher meta-reflexivity are more likely to check media information frequently. The effect of gender is more ambivalent. While women are more meta-reflexive than men, they are still less likely than men to frequently check the accuracy information in the media.

4. Discussion and conclusion

Information provided by mass media, the stories they tell, and their representations, offer selective information about the world. The media play an essential function of interpretation that helps us to understand, visualise, and value the events, persons or objects that they describe. Due to the rise of digital media, there is a flood of messages conveyed through social media, blogs, sharing networks, social news, and similar. However, it is the lack of accountability, quality, and accuracy assurance tools of the messages that leads to the manipulative uses of communication infrastructures, which is thus further harnessed to produce, circulate, and amplify disinformation on a larger scale than before. One can see that this often occurs in new and unexpected ways, which are still poorly mapped and understood (European Commission, 2018).

A common way of countering the spread and harmful effects of fake news and other forms of disinformation are initiatives that help create resilience among citizens and empower the various actors impacted. Examples include initiatives to influence 'findability', privileging credible content in ranking algorithms, initiatives to identify and document disinformation sources, policies aimed at ensuring an enabling environment for news media and professional journalism, as well as investments in media and information literacy that would build resilience among people (European Commission, 2018). Fact-checking has become a necessity in the current digital environment and this vital function aiming at sustaining the credibility of information shared in digital environments can be performed by various stakeholders including independent source and fact-checkers from civil society or interested businesses as well as people, members of the audience themselves.

A growing need for developing resilience to negative phenomena produced by the media landscape, such as disinformation, hate speech, and fake news, has led to growing support of efforts aimed at improving critical thinking and digital media literacy, including training actions and the provision of tools to help users identify disinformation. The goal of such activities is to empower people to make informed decisions and take an active role in society.

It is assumed that media literacy, also relying on critical thinking capabilities of digitally literate individuals, will ensure that the digital information ecosystem can be trustworthy. The Higher-Level Expert Group on Fake News and Disinformation stresses that media literacy is a critical action line as a response to disinformation because it can empower individual users, and mass empowerment of users will lead to greater social resilience against disinformation and perhaps other disorders of the information age (European Commission, 2018).

The purpose of our research has been to test the impact of reflexivity on the critical assessment of media content and the actual fact-checking by the media audience. Based on our research findings, we can see that critical thinking, and consequently also possibilities for media literacy, is tightly interwoven with the reflexive capacities of individuals. Using Archer's modes of reflexivity (Archer, 2007; 2012), it seems that only the specific mode of reflexivity, namely meta-reflexivity, can enable the media audience to take a critical distance towards media messaging and support analysis, evaluation, and reflection of media messages. *According to Archer (2007), meta-reflexive people* are critically reflexive about their own internal conversations and also critical about the prospects of effective action in society.

Our research shows that meta-reflexivity significantly increases the probabilty of consistent fact-checking even when one controls for the effects of gender, age and education. Our findings also show that critical thinking and reflexive capacities are unequally distributed among the population. In addition to the effect of age and education, one can notice considerable differences among the population in terms

of gender, which call for specific education strategies in that field, as those differences are far from being straightforward. While being equipped with higher meta-reflexivity, women's structural deprivation might give them fewer opportunities (perhaps in terms of available time) to make frequent additional checks of media content. Previous ethnographic studies (Gill, 2007) on practices of media use in everyday life have shown that women's viewing of media in domestic spaces has traditionally been more distracted when compared to men. The reason for that can be found in different perceptions of home and domestic life, which have historically different meanings for each gender. Women have often lacked time and motivation to regularly and attentively check media content due to their specific position within the family structure and the expectations and time-demands placed upon them (Gill, 2007). They are also profoundly torn between career and domestic lives.

Recent data have shown that women were found to do 2.6 times the amount of unpaid care and domestic work that men do (UN Women, 2018). This also has a certain impact on their reflexivity modes. Previous studies have seen women as 'reflexivity losers' (McNay, 1999; Adkins, 2003), lacking the positions of 'reflexive authority' (Adkins, 2003; Adams, 2006: 519). Similarly, it has been argued that while women are more often meta-reflexive, they are also more fractured (Golob & Makarovi , 2018). Even in the current expansion of technological devices and internet access, there are still rooted causes of the digital gender divide pointing to inherent biases in socio-cultural norms (OECD, 2018a; OECD, 2018b; Hilbert, 2011; Cooper, 2006). Our findings, similar to many recent research on gender equality and media (see for example Prendes-Espinosa et al., 2020; Regueira et al., 2020; García-Ramos et al., 2020) indicate the promotion of gender equality and women's empowerment through the media and its integration into processes of media education can reduce gender inequality.

Meta-reflexivity has become a dominant mode reflecting the individuals' responses to the rising morphogenetic impetus of structural and cultural domain (Archer, 2012; Golob & Makarovi , 2018). However, (meta-)reflexivity is about asking questions and developing a critical stance but it does not guarantee actual fact-checking action. Thus, the active agency of the media fact-checking, in contrast, remains much scarcer. This is consistent with the fact that our path analysis model only explains seven per cent of the total variance of the dependent variable. Besides, as indicated by our research –meta-reflexivity itself is unevenly distributed among the population– with lower reflexivity scores among the elderly and the less educated. Therefore, we claim that meta-reflexivity is essential for the fact-checking but it is not sufficient to deal with all the problems of fake news and other forms of disinformation.

Consequently, we see that current educational efforts to develop the cognitive, emotional, and social competences needed to navigate digital media reality, with core competences being the ability to use, the ability to analyse, evaluate and reflect on the media messages, and the ability to create and focus on creative problem solving, may not be enough for individuals to take actual action themselves. So, when dealing with the problem of fake news and disinformation, it is important to further support organised professional fact-checkers in addition to cultivating critical thinking and acting as a result of it. Offering transparent and ethically guided plural fact-checking services to people and educating them on their use may have a more significant impact on building resilience towards fake news and disinformation compared to the expectation that masses of meta-reflective people are empowered enough to deal with fake news and disinformation autonomously.

It is essential to motivate civic organisations and the media industry to increase online transparency and protect citizens, to strengthen their ability to detect and expose disinformation. Online platforms, advertisers and the media industry have a crucial role to play in amplifying, targeting, and spreading disinformation messages of malicious actors, and their cooperaton with professional independent fact-checkers and researchers can detect and flag disinformation and make fact-checkers content more visible to the audiences. Their services should be easy to use in order not to exclude large parts of the population that do not have the knowledge, skills, or time to participate in the quest for the truth in digital messages.

In such circumstances, there is a need to include contents in media education courses, with the aim of creating not just a critical thinking process but also action in the form of a habit of fact-checking and using fact-checking services. Both formal educational systems as well as informal training should strongly support individuals to be critical users of digital sevices themselves, conscious of digital media circumstances in a

post-truth world (Peters et al., 2018), but also raise the awareness of the critical role that professional fact-checkers play in society, present their services to users, and deliver concrete know-how on how to use them. As fake news and disinformation affect everyone, educational activities targeting very diverse groups of people (considering various digital divides according to age, gender, education or social circumstances) may have a greater impact, if they are tailored to the particular needs and circumstances of a specific group and delivered in a timely manner. Obviously, the exact effects of such actions are beyond the scope of this study and would clearly require further research.

The media landscape changes very quickly, so educational efforts should follow at a similar pace. When developing media education courses and training, especially with activities aiming at fostering reflexivity and critical thinking skills, the research results of our survey can be utilised. When considering demographic factors affecting meta-reflexivity, we have found that meta-reflexivity decreases with age. Younger generations are more meta-reflexive, as are women and those with tertiary education. Persons with tertiary education are more likely to be meta-reflexive, and persons with higher meta-reflexivity are more likely to check media information frequently. While women are more meta-reflexive than men, they are still less likely than men to frequently check for the accuracy of information. However, our results also show that meta-reflexivity does not automatically create the active responses from individuals. People that develop critical thinking skills may even develop fractured reflexivity: internal conversations that cannot lead to purposeful courses of action but only intensify personal distress and disorientation. Further research on factors determining reflexivity and action in digital environment and integration of such knowledge into media education projects of various stakeholders (schools, training centres, civil society, parents) is required to meaningfully support people to develop the media literacy skills needed for socially smart and beneficial ways of using media.

Funding Agency

Data collection process and the preparation of this paper was supported by Slovenian Research Agency, in the framework of Infrastructure program of the Faculty of Media - Collecting, Managing and Archiving Data on Media Literacy (Ref. I0-0045) and in the framework of the research project Ref. J5-1788 Advancing social and environmental sustainability: Exploring and predicting responsible behavior in Slovenia.

References

Adams, M. (2006). Hybridizing habitus and reflexivity: towards an understanding of contemporary identity? *Sociology*, *40*(3), 511-528. https://doi.org/10.1177/003803850663672

Adkins, L. (2004). Reflexivity: Freedom or habit of gender? *The Sociological Review*, *52*(2_suppl), 191-210. https://doi.org/10.1111/j.1467-954x.2005.00531.x

Akram, S., & Hogan, A. (2015). On reflexivity and the conduct of the self in everyday life: Reflections on Bourdieu and Archer. *The British Journal of Sociology*, *66*(4), 605-625. https://doi.org/10.1111/1468-4446.12150

Archer, M. (2007). *Making our way through the world: Human reflexivity and social mobility*. Cambridge University Press. https://doi.org/10.1017/CBO9780511618932

Archer, M. (2012). *The reflexive imperative in late modernity*. Cambridge University Press. https://doi.org/10.1017/CBO9781139108058

Barclay, A.D. (2018). *Fake News, propaganda and plain old lies: How to find trustworthy information in the digital age*. Rowmand & Littelfield. https://bit.ly/2ZHCJJh

Buckingham, D. (2003). *Media education: Literacy, learning and contemporary culture*. Polity Press. https://bit.ly/2O8E0md

Caetano, A. (2015). Defining personal reflexivity: A critical reading of Archer's approach. *European Journal of Social Theory*, *18*(1), 60-75. https://doi.org/10.1177/1368431014549684

Carrigan, M. (2017). Flourishing or fragmenting amidst variety: And the digitalization of archive. In M. Archer (Ed.), *Morphogenesis and Human Flourishing* (pp. 163-183). Springer. https://doi.org/10.1007/978-3-319-49469-2_8

Cooper, J. (2006). The digital divide: The special case of gender. *Journal of Computer Assisted Learning*, *22*(5), 320-334. https://doi.org/10.1111/j.1365-2729.2006.00185.x

Depaulo, M.B. (2018). *The psychology of lying and detecting lies*. CreateSpace Independent Publishing Platform.

Dyke, M., Johnston, B., & Fuller, A. (2012). Approaches to reflexivity: Navigating educational and career pathways. *British Journal of Sociology of Education*, *33*(6), 831-848. https://doi.org/10.1080/01425692.2012.686895

European Commission (Ed.) (2018). *The multi-dimensional approach to disinformation: Report of the Independend High Level Group on Fake News and Online Disinformation*. Publications Office of the European Union. https://bit.ly/396MJxO

García-Ramos, F., Zurian, F., & Núñez-Gómez, P. (2020). Gender studies in Communication Degrees. [Los estudios de género en los Grados de Comunicación]. *Comunicar*, *63*, 21-30. https://doi.org/10.3916/c63-2020-02

Gill, R. (2007). *Gender and the media*. Polity Press. https://bit.ly/2OGn0UG

Goering, C.Z., & Thomas, P.L. (2018). *Critical media literacy and fake news in post-truth America*. Brill Sense. https://doi.org/10.1163/9789004365360
Golob, T., & Makarovi , M. (2018). Student mobility and transnational social ties as factors of reflexivity. *Social Sciences*, *7*(3), 46-46. https://doi.org/10.3390/socsci7030046
Golob, T., & Makarovi , M. (2019). Reflexivity and structural positions: The effects of generation, gender and education. *Social Sciences*, *8*(9), 248-248. https://doi.org/10.3390/socsci8090248
Haddon. https://doi.org/10.1332/policypress/9781847428837.003.0007
Hall, S., Evans, J., & Nixon, S. (2013). *Representation: Cultural representations and signifying practices*. Sage. https://bit.ly/3jmh6py
Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *Women's Studies International Forum*, *34*, 479-489. https://doi.org/10.1016/j.wsif.2011.07.001
Hobbs, R. (2010). *Digital and media literacy: A plan of action*. The Aspen Institute and Knight Foundation. https://bit.ly/2DVa8HX
Lazer, D.M.J., Baum, M.A., Benkler, Y., Berinsky, A.J., Greenhill, K.M., Menczer, F., Metzger, M.J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S.A., Sunstein, C.R., Thorson, E.A., Watts, D.J., & Zittrain, J.L. (2018). The science of fake news. *Science*, *359*(6380), 1094-1096. https://doi.org/10.1126/science.aao2998
Little, R. (1993). Post-stratification: A Modeler's perspective. *Journal of the American Statistical Association*, *88*(423), 1001-1012. https://doi.org/10.1080/01621459.1993.10476368
Livingstone, S. (2004). Media literacy and the challenge of new information and communication technologies. *The Communication Review*, *7*(1), 3-14. https://doi.org/10.1080/10714420490280152
Lotero-Echeverri, G., Romero-Rodriguez, L.M., & Perez-Rodriguez, M.A. (2018). Fact-checking vs. fake news: Confirmation journalism as a tool of media literacy against misinformation. *Index.Comunicacion*, *8*(2), 295-316. https://bit.ly/2ZKpbNj
Martens, H. (2010). Evaluating media literacy education: Concepts, theories and future direction. *Journal of Media Literacy Education*, *2*(1), 1-22. https://bit.ly/2CQdyeq
Martens, H., & Hobbs, R. (2015). How media literacy supports civic engagement in a digital age. *Atlantic Journal of Communication*, *23*(2), 120-137. https://doi.org/10.1080/15456870.2014.961636
Martin, P.M., & Jerry, J.O. (2019). Patterns of deceptive communication of social and religious issues in social media: Representation of social issues in social media. In *Handbook of research on deception, fake news, and misinformation online* (pp. 490-502). IGI Global. https://doi.org/10.4018/978-1-5225-8535-0
Mascheroni, G., & Murru, M.F. (2014). Digital literacies and civic literacies: Theoretical sssues, research questions and methodological approaches. *Medijska istraživanja*, *20*(2), 31-53. https://bit.ly/2ODFg0L
McNay, L. (1999). Gender, habitus and the field: Pierre Bourdieu and the limits of reflexivity. *Theory, Culture & Society*, *16*, 95-117. https://doi.org/10.1177/026327699016001007
Meriton, R.F. (2016). *Advancing a morphogenetic understanding of organisational behaviour: An Investigation into the psychological mechanisms and organisational behavioural tendencies of autonomous reflexivity*. [Doctoral dissertation, University of Leeds]. https://bit.ly/30Fg1B1
OECD (Ed.) (2018a). *Towards the implementation of the G20 roadmap for digitalisation: Skills, business dynamics and competition*. OECD. https://bit.ly/2upzPfo
OECD (Ed.) (2018b). *Bridging the digital gender divide include, upskill, innovate*. OECD. https://bit.ly/37SLrVV
Peters, M.A., Rider, S., Hyvönen, M., & Besley, T. (2018). *Post-truth, fake news: Viral modernity & higher education*. Springer. https://doi.org/10.1007/978-981-10-8013-5
Porpora, D.V., & Shumar, W. (2010). Self-talk and self-reflection: A view from the US. In M. Archer (Ed.), *Conversations about reflexivity* (pp. 206-220). Routledge. https://doi.org/10.4324/9780203867556
Prendes-Espinosa, M., García-Tudela, P., & Solano-Fernández, I. (2020). Gender equality and ICT in the context of formal education: A systematic review. *Comunicar*, *63*, 9-20. https://doi.org/10.3916/c63-2020-01
Regueira, U., Alonso-Ferreiro, A., & Da-Vila, S. (2020). Women on YouTube: Representation and participation through the Web Scraping technique. [La mujer en YouTube: Representación y participación a través de la técnica Web Scraping]. *Comunicar*, *63*, 31-40. https://doi.org/10.3916/c63-2020-03
Rivera-Rogel, D., Zuluaga-Arias, L.I., Ramírez, N.M.M., Romero-Rodríguez, L.M., & Aguaded, I. (2017). Media competencies for the citizenship training of teachers from Andean America: Colombia and Ecuador. *Paidéia*, *27*, 80-89. https://doi.org/10.1590/1982-43272766201710
Samuel-Arzan, T., & Hayat, T. (2019). Online news recommendations credibility: The tie is mightier than the source. [La credibilidad de las noticias digitales: El vínculo es más impactante que la fuente]. *Comunicar*, *60*, 71-80. https://doi.org/10.3916/C60-2019-07
Sonck, N., Kuiper, E., & De-Haan, J. (2012). Digital skills in the context of media literacy. In S. Livingstone, & L. Haddon (Eds.), *Children, risk and safety on the Internet*. Policy Press. https://doi.org/10.1332/policypress/9781847428837.003.0007
StataCorp (Ed.) (2015). *Stata statistical software (Release 14)*. College Station, TX: StataCorp LP.
Statistical Office of the Republic of Slovenia (Ed.) (2011). *Register-based census 2011*. SURS. https://bit.ly/2vbyskW
Strutt, D. (2019). *The digital image and reality*. Amsterdam University Press. https://doi.org/10.5117/9789462987135
Taylor, M.P. (2003). *Munitions of the mind. A history of propaganda from the ancient world to the present era*. Manchester University Press. https://doi.org/10.5117/9789462987135
UN Women (Ed.) (2018). *Turning promises into action: Gender equality in the 2030 Agenda for sustainable development*. United Nations Entity for Gender Equality and the Empowerment of Women. https://bit.ly/32nByyu

Comunicar, n. 66, v. XXIX, 2021 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com

Predicting wellbeing in children's use of smart screen devices

Predicción del bienestar sobre el uso de pantallas inteligentes de los niños

Dr. Félix Ortega-Mohedano. Associate Professor, Faculty of Social Sciences, University of Salamanca (Spain) (fortega@usal.es) (https://orcid.org/0000-0003-2735-4813)
Dr. Fernando Pinto-Hernández. Assistant Professor, Faculty of Law and Social Sciences, King Juan Carlos University, Madrid (Spain) (fernando.pinto@urjc.es) (https://orcid.org/0000-0003-1525-3206)

ABSTRACT

This study presents an explanatory Ordinary Linear Regression Model for predicting wellbeing in the use of smart screen devices among children and youngsters in Spain, using a database of microdata for a total of 23,860 national representative households and some 6,106 total cohabiting minors under 15 years of age. The World Health Organization actively recommends children and youngsters to spend less hours in front of smart screen devices and encourages substituting them with more active play and direct socialisation. The main purpose of our research is to study the impact of the use of these devices on mental and physical well-being, sleep pattern, and the potential explanatory effects. To address the analysis, we contrasted the modelisation model proposed with microdata provided in the 2017 version of the National Health Survey in Spain. We performed a series of ordinary least square regression models OLS, obtaining significant information on the effects and risks excessive use of smart screen devices may be inflicting on children and adolescents in Spain. As a main result, we contrasted with the data and the modelisation that those individuals who use these devices more intensively have higher risk of mental health problems, significantly reduced sleeping hours and have a higher chance of suffering physical health problems such as obesity.

RESUMEN

Este artículo presenta un Modelo Lineal General de Regresión para predecir el bienestar en el uso de pantallas inteligentes entre niños y jóvenes en España utilizando una base de datos de microdatos para un total de 23.860 hogares representativos nacionales y unos 6.106 menores cohabitantes de menos de 15 años. La Organización Mundial de la Salud recomienda activamente que los niños y jóvenes pasen menos horas frente a las pantallas inteligentes y alienta sustituirlas por un juego más activo y físico acompañado de socialización directa. El objetivo principal de nuestra investigación es estudiar el efecto del uso de estos dispositivos en el bienestar mental y físico, el patrón de sueño y los posibles efectos explicativos que se derivarían. Para abordar el análisis, comparamos la modelización propuesta con los microdatos proporcionados por la versión 2017 de la Encuesta Nacional de Salud en España. Ejecutamos una serie de modelos de regresión de mínimos cuadrados ordinarios MCO, obteniendo información significativa sobre los efectos y con ella sobre los riesgos que el uso excesivo de estos dispositivos pudiese estar infligiendo en niños y adolescentes en España. Como resultado principal, hemos contrastado con los datos y la modelización que las personas que usan estos dispositivos con mayor intensidad tienen un mayor riesgo de padecer problemas de salud mental, han reducido significativamente sus horas de sueño y tienen una mayor probabilidad de sufrir problemas de salud física como obesidad.

KEYWORDS | PALABRAS CLAVE

Media consumption, child audiences, obesity, health, TIC, linear regression model.
Consumo mediático, audiencias infantiles, obesidad, salud, TIC, regresión lineal ordinaria.

Received: 2020-05-19 | Reviewed: 2020-06-09 | Accepted: 2020-07-03 | Preprint: 2020-11-15 | Published: 2021-01-01
DOI https://doi.org/10.3916/C66-2021-10 | Pages: 113-122

1. Introduction and object of investigation

Research on children's habits of use and consumption of smart screens has received renewed attention in the last decade in our social context. The fifth AIMC Niñ@s-Children study in Spain (AIMC, 2019) already indicates that children aged six to nine have 35.4% and 8.8% access to a private tablet and smartphone, respectively, reaching 47.8% and 61.6% in age groups between 10 and 13 years.

The diffusion of smart screens like smartphones and tablets broadly reached 85% and 60% respectively among adolescents under the age of 18 in Spain. On the other hand, there is a need to build methods and systems for measurement, monitoring and evaluating children's and adolescent's usage habits and consumption of smart screens. This study shows the results of the analysis of simultaneous OLS (Ordinary Linear Regression Models) modelling the habits of use and consumption of children under 15 in Spain.

Quantitative and qualitative research on children, media and smart screens is an area of analysis that has been established as a research niche in the disciplinary field of Communication both at the national and international levels, in research associations such as ECREA, the European Communication Research and Education Association, in its thematic section Children Youth and Media and ICA, International Communication Association, in its section-division, Children Adolescents and Media in the last decade.

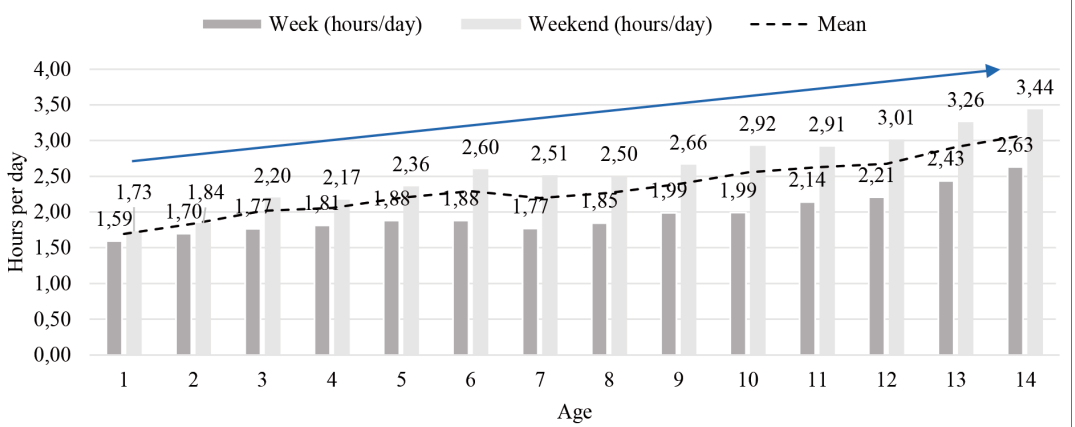
Research on children and the Internet, its risks, threats, and opportunities dates back to research carried out in the last 15 years by teams led mainly by Sonia Livingstone, Cristina Ponte and Elisabeth Staksrud (Livingstone & Blum-Ross, 2020, Livingstone et al., 2018: Ponte et al., 2019; Ponte & Batista, 2019; 2018; Staksrud et al., 2013) with the different editions of the Kids Online and Global Kids Online research projects. The research in this area has been complemented by the work performed by the Common Sense Media organization since 2013, and in particular its research on children from Zero to Eight in its first edition in 2011 and subsequent work (Common Sense Media, 2011; Rideout & Robb, 2019), as also relevant is the research linked to media literacy by Jackie Marsh's team at the DigiLitEY Cost Action at http://digilitey.eu/ and other associated research is also a significant example of the interest and progression on this research niche.

More current research has focused on the increase use of smart screens at younger ages, using interdisciplinary techniques and approaches to study these phenomena (Crescenzi-Lanna et al., 2019), and fostering continuous research on the risks, rights, ethical issues and opportunities for the younger generations (Livingstone et al., 2020; 2018). Our research follows the results of the Children and Media Section of the ECREA association, and its recent congress (www.childrenandsmartscreens.eu). The study focuses on contrast correlations linked to consumption patterns in Spain among youngsters, through data modelling using an Ordinary Linear Regression approach. The data was provided by the Spanish National Research Institute, and in particular the representative National Health Survey (National Health Survey, 2017).

One of the relevant variables in defining smart screen consumption patterns among children is connected to the quantification, and the measurement of the daily hours spent by children from 1 to 14 years of age in Spain. There is a correlation in the consumption during the week and during the weekend. Children aged 1 to 6 spend between 1.59 hours and 1.88 hours in front of a smart screen on weekdays and between 1.73 hours and 2.60 hours during the weekend. Consumption of these devices progressively increases to 3.44 hours and 2.66 hours during the weekend, and weekdays respectively. The data analysed show that one of the main activities of our children and adolescents involves spending time in front of smart screens. The tendency increases steadily with age and shows that the time spent is strongly related to sedentarism and consumption of audio-visual content.

The data provided by the Research AIMC Niñ@s 2019 indicates that children between 6 and 13 years of age spend an average of 5 hours a day in front of a screen, 89% of them consume videos from the Internet and 36% do it on a regular daily basis. Smartphones, tablets, televisions and gaming consoles are equally preferred, and Spanish children have an average of seven technological devices at their disposal at home, and an average of four devices for regular use in children from 6 to 13 years of age (AIMC, 2019).

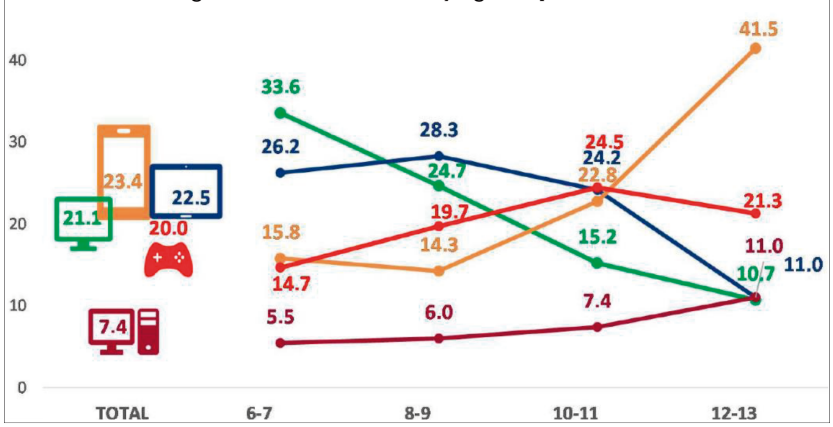
Figure 1. Connection between the number of daily hours in front of smart screens for children and their age (on weekdays and the weekend) in 2017



Note. 'Authors' from the National Health Survey (Spain, 2017).

It is also important to indicate, as we illustrate in the following graph, that with age, smartphones and gaming consoles become increasingly important for preadolescents of 12 to 13 years old, with a 41.5% and 21.3% preference increasing and reversing preferences regarding television screens and tablets. The younger generation uses tablets and television for co-viewing to favour parental supervision, and progressively as they become independent, more autonomous smartphones and gaming consoles prevail.

Figure 2. Preferred screen by age in Spain in 2019



Note. AIMC Niñ@ report 2019 (AIMC, 2019), graphs indicate years of age, data in preference percentage.

It is also important to note that on the aggregate, smartphones and tablets are preferred gadgets for girls whereas gaming consoles and tablets and television lead boys' preference in Spain similarly. The gaming console is still marginal with only 5% use for girls (AIMC, 2019). There is a clear gender-related difference in device sharing patterns and preferences linked primarily to audio-visual content, availability and cultural consumption patterns among these age groups in western society.

Relevant research on children, media and health issues such as obesity has been undertaken in recent years by Kenney and Gortmaker (2017), Robinson et al. (2017) and Borzekowski (2014). These authors analysed the impact of media use on children's weight and adolescents' media use on health respectively, as well as research on emotional well-being linked to digital media consumption and exposure (Hoge et al., 2017) or health-related social media (Goodyear et al., 2018) among others.

The research project we present in this article is part of a study led by Rey Juan Carlos University and the University of Salamanca in Spain. A description of the research can be found on www.mapcom.es.

You may also consult the research instruments, data matrixes, scientific publications and presentations at the most relevant conferences. In this article, we present the results of the research on children and its most relevant conclusions after data collection.

2. Methodology and sample data

For its most recent available data, our research uses as its main database the National Health Survey from the National Statistical Institute in Spain (National Health Survey, 2017). This is based on a five-year cross section that collects cut data on the household characteristics, the number of adults, and in particular those aged 65 and above and under 15 years of age. For our study, we used the data set of households with children under 15 years of age, as this age group is the most suitable for answering the research questions on children. This database consists of microdata for a total of 23,860 national representative households who have 6,106 cohabiting minors under 15 years of age. The possibility of analysing households' sociodemographic data is of interest, and variables such as household size, composition or the employment situation of its members were taken into account. The access to the data set on minors below the age of 15 provides the practical opportunity to analyse their characteristics, emphasising those variables related to behaviour and mental health linked to the usage and consumption of smart screens and media. The distribution of children by age in our data set is according to the age structure of Spain´s population, balanced in quotas of ages and gender (National Health Survey, 2017).

The empirical strategy we have fostered comprises the following theoretical set. The strategy used to identify the impact that the amount of time per day children spend in front of a device with a screen has had on children's health is the estimation of series of OLS (Ordinary Linear Regression Models) modelled in all cases for each of the dependent variables (emotional, companionship, behaviour, sleeping time, body mass index, and obesity). A general procedure to follow the regression models is expressed as follows:

$$Y_i = \beta_0 + \beta_1 Pantalla_i + \beta_2 X_i + \varepsilon_i$$

Where γ_i represents the aggregated health of the individual. Thus, Screen_i , represents the number of hours per day that children spend in front of a device with a screen and χ_i , represents the set of control variables introduced in the model. Finally, ε_i represents the error term of the estimates.

The ordinary least squares model is one of the most extensively used linear regression models in different disciplines, particularly in medicine, economics and sociology. Some studies refer to its effectiveness in predicting the effects of some variables on others (Wooldridge, 2010, Shepperd & Macdonell, 2012). Various researchers in the field of social science have applied the ordinary least squares method to estimate impact, like Sturman (1996) and Choi (2009) among others.

Thus, we prefer using OLS over non-linear alternatives (i.e., probit or logit models) to favour consistency over efficiency, as suggested by Angrist and Pischke (2008). Linear models ensure consistency as long as the given disturbance and the covariance do not correlate, and therefore, do not require any additional assumption about the functional form of the error term. In this sense, the ordinary least squares method allows us to identify and know the effect of one or several variables on the one corresponding to the study object. According to Angrist and Pischke (2014), the OLS model reliably explains the impact regardless of the particularities of the variables. The consistency of the methodology applied in our research has been frequently proven in prior investigations in the social sciences.

3. Results and descriptive statistics

The analysis of the results includes the descriptive statistics that define the characteristics of the sample. As for the variables of the study object of this article, we must highlight that the average of those related to the use of screens, among the population below 15 years of age is around 2.44 hours a day. Specification of this data show that the average daily use of 2.05 hours in weekdays as opposed to the weekend where the consumption is much more intense at 2.72 hours per weekend day. Adolescents have a differentiated time consumption distribution following cultural and behavioural patterns between weekdays and weekends regarding specificity of each country. On the other hand, we have the variables that we want to explain and interpret within the model. Among them, we can observe, for example, that the average body mass

index of children is 16.85 kg/m2 or that the average number of hours of sleep of children within the data set is of 9.75 hours per day. Thus, the following table describes the characteristics of the sample, both for the explanatory and control variables, and to explain the variables. The following table accurately indicates the data analysed representing mean, standard deviation, maximum, and minimum.

Table 1. Descriptive statistics of the OLS

	Mean	Standard deviation	Min	Max
Use of screens (hours per day)	2.446	1.125	1	10
Use of screens (hours per day - week)	2.052	1.129	1	10
Use of screens (hours per day - weekend)	2.727	1.372	1	12
Emotional	0.709	0.454	0	1
Companionship	0.623	0.4846	0	1
Behaviour	0.715	0.451	0	1
Sleep time (hours)	9.751	1.583	1	20
Body Mass Index (BMI)	16.85	6.130	0.030	50
Obesity	0.015	0.121	0	1
Household unemployment rate	0.158	0.286	2	1
Household size	3.811	0.981	0	12
% of women in the household	0.292	0.454	0	1
% of retired people in the household	0.012	0.062	0.100	0.666
% of children in the household	0.414	0.123	0	0.833
Average educational level	0.613	0.407	0	1
Sex	0.481	0.499	0	1
Age	7.557	4.300	0	14
Nationality	0.947	0.222	0	1
Chronic disease	0.154	0.361	0	1

Note. Own elaboration from the National Health Survey (Spain, 2017).

The next table represents the results of the first five linear regression models, each one of them depending on the variable associated we want to explain. The complete programming of the data set within the STATA statistical software can be accessed on request.

Table 2. Ordinary Least Squares Regression models

	Emotional	Companionship	Conduct	Sleep time	BMI	Obesity
Use of screens (hours per day)	0.037***	0.041***	0.035***	-0.064***	0.222**	0.008***
	(0.007)	(0.007)	(0.006)	(0.016)	(0.088)	(0.003)
Household unemployment rate	0.039	0.078***	0.004	0.028	0.569*	-0.000
	(0.025)	(0.027)	(0.025)	(0.061)	(0.342)	(0.008)
Household size	0.008	-0.020**	-0.001	0.019	-0.156	0.001
	(0.008)	(0.008)	(0.008)	(0.018)	(0.113)	(0.003)
% of women in the household	0.022	0.020	0.008	-0.107***	0.388*	0.003
	(0.017)	(0.017)	(0.016)	(0.038)	(0.212)	(0.005)
% of retired people in the household	-0.135	0.159	0.052	-0.561**	0.439	-0.028
	(0.129)	(0.123)	(0.126)	(0.278)	(1.478)	(0.038)
% of children in the household	-0.091	-0.200***	0.028	0.032	-1.735**	0.007
	(0.061)	(0.063)	(0.059)	(0.142)	(0.787)	(0.018)
Average educational level	-0.029	-0.056***	-0.033*	0.067	-0.261	-0.020***
	(0.018)	(0.019)	(0.018)	(0.045)	(0.247)	(0.006)
Gender	-0.008	-0.004	-0.052***	-0.001	0.023	-0.001
	(0.014)	(0.015)	(0.014)	(0.032)	(0.178)	(0.004)
Age	-0.027***	-0.033***	-0.029***	-0.161***	0.453***	-0.002***
	(0.002)	(0.002)	(0.002)	(0.005)	(0.027)	(0.001)
Nationality	-0.045	-0.021	0.028	0.005	0.847*	-0.004
	(0.030)	(0.033)	(0.033)	(0.079)	(0.472)	(0.011)
Chronic disease	0.066***	0.059***	0.011	0.050	0.211	0.004
	(0.019)	(0.020)	(0.019)	(0.042)	(0.227)	(0.006)
Constant	1.032***	0.851***	0.782***	11.126***	12.458***	0.025
	(0.062)	(0.066)	(0.064)	(0.151)	(0.896)	(0.020)
Observations	3,992	3,992	3,992	3,992	3,992	3,992
R-squared	0.082	0.112	0.094	0.301	0.127	0.017

Note. Prepared by the authors from the National Health Survey microdata set (Spain, 2017). Robust standard errors in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.1. All models include region as control variable.

The models show how, the average effect of using display devices (understood as the average daily use on weekdays and the weekend) increases the probability of suffering emotional, behavioural or problems in social interaction of children with their peers. It also has a similar positive impact on the body mass index and the risk of obesity. In other words, the more the screen devices used, the higher the body mass index detected within the OLS (Ordinary Linear Regression) model. By comparison, the coefficient linked to the total sleep time is statistically significant and negative. This can be interpreted as follows: more hours in front of the screens have a direct effect on the reduction of children's sleep duration, with the subsequent health implications.

To contrast the results and make them more reliable, we have simultaneously used the same models, but in this case, detailing the impact of the use of smart screens per hours/day during the week (from Monday to Friday) and hours/day during the weekend (from Saturday to Sunday). Table 3 shows how the usage frequency, screen consumption and the impact trend are repeated throughout the five models used for the days of the week. It is relevant to note that the set of results has increased in significance for some of the models concerning the prior matrix of results as indicated in the following table. The coefficient relation remains stable and intensifies during the weekend.

In Table 3, we also analysed the results of the use of smart screen devices during the weekend in Spain among the studied population. Thus, we again find that the results hardly vary in terms of significance; however, the impact on the explanatory variables is more intense as in the OLS (Ordinary Linear Regression) model for weekday consumption.

Table 3. Ordinary least squares regression models. Frequency of hours of use during weekdays and the weekend

	Emotional	Companionship	Conduct	Sleep time	BMI	Obesity
Use of screens (hours per day – weekday, Monday to Friday)	0.034***	0.046***	0.034***	-0.047***	0.188***	0.008***
	(0.007)	(0.007)	(0.006)	(0.016)	(0.068)	(0.003)
Observations	3,974	3,974	3,974	3,974	3,974	3,974
R-squared	0,082	0,104	0,091	0,294	0,110	0,017
Use of screens (hours per day - weekends)	0.021***	0.023***	0.027***	-0.066***	0.142***	0.007***
	(0.005)	(0.006)	(0.005)	(0.012)	(0.053)	(0.002)
Observations	4,423	4,423	4,423	4,423	4,423	4,423
R-squared	0,070	0,097	0,092	0,304	0,124	0,017

Note. Prepared by the Authors from the National Health Survey (Spain, 2017). Notes: Robust standard errors in parentheses. Significance: *** p<0.01, ** p<0.05, * p<0.1. All models include large set of control variables.

The data set from the National Health Survey and our OLS (Ordinary Linear Regression) model detected that the average impact effect of the use of screen devices increases the probability of suffering emotional, behavioural or social interaction problems for the children with their peers. Parents who do not supervise and monitor screen time consumption may experience a significant increase in children's bad behaviour. Similarly, our dataset modelling has observed a positive impact on body mass index and the risk of obesity. The more screen devices used, the higher the body mass index detected within the OLS model for Spain within the data set for year 2017. On the other hand, the coefficient relation for the total sleep time is statistically significant and negative, which may be due to the fact that a large number of hours in front of the media screens has a direct effect on the reduction of children's sleep time, with the subsequent implications. Therefore, we detected a sharp contrast and confirmed for the first time in Spain that there is a negative relationship effect in aggregated general health γ_i . In other words, a rise in screen time consumption increases the probability of obesity, a higher body mass index, and behavioural incidents with peers and companions.

4. Discussion and conclusions

The production of knowledge is associated with significant changes in collective attention, which is consistent with a scenario in which the allocation of attention to a topic or platform stimulates the demand in a like economy (Gerlitz & Helmond., 2013). Adolescents are considered a vulnerable group as they are easily influenced and may therefore develop problems in consumption patterns such as smart

device consumption. This means that more focus is put on detecting time allocation patterns, interest and addictions at a younger age for different economic, social and health issues. This emerging tendency and research field of interest has been identified in our academic sphere by Gomes-Franco-Silva and Sendín-Gutiérrez (2014), among others, indicating the risk of this to become pathological, and the need for early detection of disorders aggravated by the everyday practices in the digital environment among adolescents in Spain.

Our research follows a complementary pathway to the studies undertaken by EU Kids Online network and Global Kids Online led by Sonia Livingstone (Trucco & Palma, 2020; Livingstone & Blum-Ross, 2020; Ponte & Batista, 2019, Stoilova et al., 2019) and the recent results presented from nineteen European countries (Smahel et al., 2020). At national level, significant research and transnational, national and regional projects have made efforts in this line of research (Jiménez et al., 2018), and made it possible to progress on pillars such as the digital life of children and adolescents by implementing different views, themes, methodologies and transdisciplinary approaches (Rich et al., 2015, Montes-Vozmediano et al., 2018; Ponte et al., 2019; Mascheroni et al., 2018; Helsper, & Smahel, 2019) providing the research field with a more diverse approach and transnational collaboration. This article provides a data method to supplement research on children, youth and media, and detecting their time allocation and potentially the positive and negative effects, which may arise.

In this context, the analysis of a total of 23,860 national representative households and some 6,106 total cohabiting minors under 15 years of age have provided with robust and conclusive results for these age groups in Spain. The significant conclusions of the OLS (Ordinary Linear Regression) models are innovative and were obtained with robustness for the first time in our country. We have positively contrasted the indicated patterns and relations between the variables within the models analysed. The following table summarises the main conclusions, weaknesses, detected threats, strengths and opportunities for present and future research in this field. In our research, we have identified the main weaknesses, threats, strengths and opportunities detected. We have confirmed and detected with reliable and representative data that there is a health crossroad effect for children and their families in Spain.

Table 4. Detected Weaknesses, Threats, Strengths and Opportunities for the OLS modelling

Weaknesses of the OLS and results	**Threats to children youth and families**
1. There is a need to run the OLS (Ordinary Linear Regression) models in a longitudinal pattern, analysing the effect and relations detected regularly. We will only have access to data from 2022, since the National Health survey is undertaken every 5 years, the next microdata set will be available in 2023. 2. The model has not detected significant weakness; however, we consider that contrasting within gender, regional and family income differences between households and cohabiting minors may be an interesting fostering second phase given the availability of these data.	1. The average impact of the use of screen devices (understood as the average use in hours during the week and the weekend) increases the probability of suffering emotional, behavioural or social interaction problems for the children with their peers. 2. The average use of screen devices has a positive impact on the body mass index and the probability of suffering from obesity. In other words, the more screen devices are used, the higher the body mass index among children. 3. The coefficient relation on the total sleep time is statistically significant and negative, thus more hours in front of screens has a direct impact on the reduction of children's sleep time, with further implications for their health. 4. The non-formation of families and the use of parental controls or safeguards for children on the Internet (Yubero et al. 2018; Valcke, 2010) and in particular on smart screens.
Strengths	**Opportunities**
1. Robustness of the data set provided by the National Health and robustness of the five applied OLS models. 2. The possibility to run cross variable inferences and effects in a longitudinal manner in Spain, and the possibility to carry out a national and European comparison.	1. Continue to detect connections on the analysed variables within the OLS modelling. 2. Continue to evaluate the evolution of the threats detected in a longitudinal manner. 3. To analyse data contrasting gender, regional and family income differences. 4. The possibility to run European and Global OLS models where data may be available from equivalent National Heath Survey.

Note. Prepared by the Authors based on the conclusion of the OLS model and research data.

Our OLS (Ordinary Linear Regression) model has detected that the average effect of the use of screen devices increases the probability of suffering emotional, behavioural or social interaction problems for children with their peers. Parents who do not supervise and/or monitor screen time consumption may experience a significant increase in their children's bad behaviour. We have also detected a positive impact on body mass index, and the risk of obesity. The more screen time, the higher the probability. The total coefficient relation on total sleep time is statistically significant and negative, thus indicating that more time in front of media screens has a direct effect on the subsequent reduction of children's sleep.

The continuous evolution of our society in normal and/or COVID-19 pandemic times is intensively transformed by renewed time allocation and media consumption patterns. The accessibility of content and direct protection and supervision provided for our children and adolescents of their screen time is a key to the transformation variable for present and future generations. We have detected that the average impact of the use of screen devices (understood as the average use in hours during the week and the weekend) significantly increases the possibility of suffering emotional, behavioural or social interaction problems for the children with their peers. Explaining this impact is certainly multivariate in conceptualisation; however, its long term effect on our society is certainly not neutral, and should, therefore, be seriously tackled by researchers, legislators, parents, educators, doctors, content providers, in general, all those caregivers who have a "duty of care" for our children and adolescents. We have also detected that the average effect of the use of screen devices has a positive impact on the body mass index and the probability of suffering from obesity. In other words, the more screen devices are used, the higher the body mass index is among children. These results link a clear event correlation and conclusion. If children and adolescents' time allocation pattern in Spain primes the non-active, non-participatory, non-supervised, non-physical activity linked to traditional smart screen consumption, our children will have negative effects on their health, in the short and medium term, since obesity and a higher body mass index are good health predictors. The instruments are not certainly the cause of these health problems among our younger generations but can be the symptom of an incorrect time allocation, physical inactivity and sedentarism in our modern western societies. Furthermore, the coefficient relation on the total sleep time is statistically significant and negative, which may be understood as the more hours in front of the media screens has a direct effect in the reduction of children's sleep time, with the subsequent effects for an appropriate physical and mental development. Inappropriate sleep time, inadequate traditional siesta planning for Spanish children and adolescents may also trigger inadequate patterns and short and medium term negative effects on the variables detected but also on educational results, the conflict in the school, mental health, and other medical issues related to lack of sleep time.

The research on the usage habits and consumption patterns of smart screens in our socio-cultural environment seems to be an object of study, which will undoubtedly be performed in depth from the field of communication and education studies, among others, in the next decade. The results presented in our article certainly open future research lines, which will necessarily lead us to analyse other age segments, gender differences and differences between regions. Comparative analysis of countries and potential specific population groups may be an interesting area to promote future research. The need detected in academic research, in families and health institutions to protect children's health and well-being related to screen time, and content access, among others has a final result. We have detected and confirmed the impact, if we may use the metaphorical parallelism, the screen time allocation the "Black Whole" is "devouring" behaviour in, sleep time, body mass index and obesity in our children. It is undoubtedly time for action and reaction.

Funding Agency

This research is part of the project «Maps of Investigation in Communication at the Spanish Universities from 2007 to 2018» (Ref. PGC2018-093358-B-100), funded by the Ministry of Science, Innovation and Universities of Spain (2018-2020), coordinated by the University Rey Juan Carlos, and Programme V for diffusion of research results at the Salamanca University.

References

AIMC (Ed.) (2019). *5º Estudio AIMC Niñ@s, 2019*. AIMC. https://bit.ly/2YbKBSP

Angrist, J.D., & Pischke, J.S. (2008). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.

https://doi.org/10.2307/j.ctvcm4j72
Angrist, J.D., & Pischke, J.S. (2014). *Mastering 'metrics: The path from cause to effect*. Princeton University Press. https://bit.ly/2KGI8ci
Borzekowski, D.L.G. (2014). Examining media's impact on children's weight: Amount, content, and context. In A. B. Jordan, & D. Romer (Eds.), *Media and the well-being of children and adolescents* (pp. 44-51). Oxford University Press. https://bit.ly/2Seja7n
Choi, S.W. (2009). The effect of outliers on regression analysis: Regime type and foreign direct investment. *Quarterly Journal of Political Science*, *4*(2), 153-165. https://doi.org/10.1561/100.00008021
Common Sense Media (Ed.) (2011). *Zero to eight: Children's media use in America*. Common Sense Media. https://bit.ly/3eDlw81
Crescenzi-Lanna, L., Valente, R., & Suárez-Gómez, R. (2019). Safe and inclusive educational apps: Digital protection from an ethical and critical perspective. [Aplicaciones educativas seguras e inclusivas: La protección digital desde una perspectiva ética y crítica]. *Comunicar*, *61*, 93-102. https://doi.org/10.3916/c61-2019-08
Gerlitz, C., & Helmond, A. (2013). The like economy: Social buttons and the data-intensive web. *New Media & Society*, *15*(8), 1348-1365. https://doi.org/10.1177/1461444812472322
Gomes-Franco-Silva, F., & Sendín-Gutiérrez, J. (2014). Internet as a haven and social shield. Problematic uses of the network by young spaniards. [Internet como refugio y escudo social: Usos problemáticos de la Red por jóvenes españoles]. *Comunicar*, *43*, 45-53. https://doi.org/10.3916/c43-2014-04
Goodyear, V.A., Armour, K.M., & Wood, H. (2018). Young people and their engagement with health-related social media: New perspectives. *Sport*, *Education and Society*, (pp. 1-16). https://doi.org/10.1080/13573322.2017.1423464
Helsper, E., & Smahel, D. (2020). Excessive internet use by young Europeans: Psychological vulnerability and digital literacy? *Information*, *Communication & Society*, *23*(9), 1255-1273. https://doi.org/10.1080/1369118x.2018.1563203
Hoge, E., Bickham, D., & Cantor, J. (2017). Digital media, anxiety, and depression in children. *Pediatrics*, *140*(Supplement 2), S76-S80. https://doi.org/10.1542/peds.2016-1758g
Jiménez, E., Garmendia, M., & Casado, M.A. (2018). *Entre selfies y whatsapps. Oportunidades y riesgos para la infancia y la adolescencia conectada*. Gedisa. https://bit.ly/2xUL7Kx
Kenney, E.L., & Gortmaker, S.L. (2017). United States adolescents' television, computer, videogame, smartphone, and tablet use: Associations with sugary drinks, sleep, physical activity, and obesity. *The Journal of Pediatrics*, *182*, 144-149. https://doi.org/10.1016/j.jpeds.2016.11.015
Livingstone, S., & Blum-Ross, A. (2020). *Parenting for a digital future, how hopes and fears about technology shape children's lives*. Oxford University Press. https://doi.org/10.1093/oso/9780190874698.001.0001
Livingstone, S., Mascheroni, G., & Staksrud, E. (2018). European research on children's internet use: Assessing the past and anticipating the future. *New Media & Society*, *20*(3), 1103-1122. https://doi.org/10.1177/1461444816685930
Mascheroni, G., Ponte, C., & Jorge, A. (2018). *Digital parenting: The challenges for families in the digital age*. NORDICOM Clearinghouse Yearbook 2018. https://bit.ly/3eXizAt
Montes-Vozmediano, M., García-Jiménez, A., & Menor-Sendra, J. (2018). Teen videos on YouTube: Features and digital vulnerabilities. [Los vídeos de los adolescentes en YouTube: Características y vulnerabilidades digitales]. *Comunicar*, *54*, 61-69. https://doi.org/10.3916/c54-2018-06
National Health Survey (Ed.) (2017). *SNHS 2017 Methology*. https://bit.ly/35cf5pC
Ponte, C., & Batista, S. (2019). *EU Kids Online Portugal. Usos, competências, riscos e mediações da internet reportados por crianças e jovens (9-17 anos)*. EU Kids Online e NOVA FCSH. https://bit.ly/3eV00wS
Ponte, C., Castro, T.S., & Pereira, S. (2019). Parenting young children in changing media environments with twenty years apart. *Comunicazioni Sociali*, *41*(2), 276-288. https://doi.org/10.26350/001200_000064
Rich, M., Bickham, D.S., & Shrier, L.A. (2015). Measuring youth media exposure: A multimodal method for investigating the influence of media on digital natives. *American Behavioral Scientist*, *59*(14), 1736-1754. https://doi.org/10.1177/0002764215596558
Rideout, V., & Robb, M.B. (2019). *The common sense census: Media use by tweens and teens*. Common Sense. https://bit.ly/2KEVXaj
Robinson, T.N., Banda, J.A., Hale, L., Lu, A.S., Fleming-Milici, F., Calvert, S.L., & Wartella, E. (2017). Screen media exposure and obesity in children and adolescents. *Pediatrics*, *140*(Supplement 2), S97-S101. https://doi.org/10.1542/peds.2016-1758k
Shepperd, M., & MacDonell, S. (2012). Evaluating prediction systems in software project estimation. *Information and Software Technology*, *54*(8), 820-827. https://doi.org/10.1016/j.infsof.2011.12.008
Smahel, D., Machackova, H., Mascheroni, G., Dedkova, L., Staksrud, E., Ólafsson, K., Livingstone, S., & Hasebrink, U. (2020). *EU Kids Online 2020: Survey results from 19 countries*. EU Kids Online. https://doi.org/10.21953/lse.47fdeqj01ofo
Staksrud, E., Ólafsson, K., & Livingstone, S. (2013). Does the use of social networking sites increase children's risk of harm? *Computers in Human Behavior*, *29*(1), 40-50. https://doi.org/10.1016/j.chb.2012.05.026
Stoilova, M., Nandagiri, R., & Livingstone, S. (2019). Children's understanding of personal data and privacy online – a systematic evidence mapping. *Information*, *Communication & Society*, (pp. 1-19). https://doi.org/10.1080/1369118x.2019.1657164
Sturman, M. (1999). Multiple approaches to analyzing court data in studies of individual differences: The propensity for Type 1 errors, illustrated with the case of absenteeism prediction. *Educational and Psychological Measurement*, *59*(3), 414-430. https://doi.org/10.1177/00131649921969956
Trucco, D., & Palma, A. (2020). *Infancia y adolescencia en la era digital: Un Informe comparativo de los estudios de Kids Online del Brasil, Chile, Costa Rica y Uruguay*. Chile, Costa Rica y Uruguay: Comisión Económica para América Latina y el Caribe (CEPAL). https://bit.ly/3fBVyTI

Valcke, M., Bonte, S., Wever, B.D., & Rots, I. (2010). Internet parenting styles and the impact on Internet use of primary school children. *Computers & Education*, *55*(2), 454-464. https://doi.org/10.1016/j.compedu.2010.02.009
Wooldridge, J.M. (2010). *Introducción a la Econometría, un enfoque moderno*. CENGAGE Learning. https://bit.ly/3eSxDQ9
Yubero, S., Larrañaga, E., Navarro, R., & Elche, M. (2018). Parents, children and Internet use. Family socialization on the Internet. *Universitas Psychologica*, *17*(2), 1-13. https://doi.org/10.11144/Javeriana.upsy17-2.phis

Comunicar

Next Issues

Comunicar 67 (2021-2):
Cyber convivencia as a social scenario: Ethics and emotions

Thematic Editors
Dr. Eva M. Romera-Félix, University of Cordoba (Spain)
Dr. Rosario Ortega-Ruiz, University of Cordoba (Spain)
Dr. Peter Smith, Goldsmiths, University of London (United Kingdom)

Initial call: 01-04-2020
Last call: 30-09-2020

Comunicar 68 (2021-3):
Networks, social movements and their myths in a hyperconnected world

Thematic Editors
Dr. Toby Miller, Autonomous Metropolitan University of Cuajimalpa (Mexico)
Dr. Eva Aladro-Vico, Complutense University (Spain)
Dr. Paula Requeijo-Rey, Complutense University (Spain)

Initial call: 01-06-2020
Last call: 30-12-2020

Comunicar 69 (2021-4):
Citizen participation in the digital sphere

Thematic Editors
Dr. Óscar Luengo, University of Granada (Spain)
Dr. Marianne Kneuer, University of Hildesheim (Germany)
Dr. Emiliana de Blasio, Free International University of Social Studies (Italy)

Initial call: 01-09-2020
Last call: 28-02-2021

Comunicar 70 (2022-1):
New challenges for teachers in the context of digital learning

Thematic Editors
Dr. Rayén Condeza Dall'Orso, Pontifical Catholic University (Chile)
Dr. Michael Hoechsmann, Lakehead University (Canada)
Dr. Divina Frau-Meigs, University of Sorbonne Nouvelle (France)

Initial call: 01-11-2021
Last call: 30-05-2021

Comunicar

Quarterly scientific journal, bilingual in Spanish and English in all its articles, and abstracts in Portuguese, Chinese and Russian. With 27 years of edition and 1850 research articles published. Presence in 797 international databases, journal evaluation platforms, selective directories, specialized portals, newspaper catalogues... Rigorous and transparent blind system of evaluation of manuscripts audited in RECYT; International Scientific Board and public network of scientific reviewers of 733 researchers from 48 countries around the world.

Professional management of manuscripts through the OJS 3 Platform with ethical commitments of transparency and timeliness, anti-plagiarism systems (CrossCheck), alternative metrics (PlumX, Dimensions)... High level of visibility with multiple search systems, DOIs, ORCID, dynamic pdfs, epub and XML, with connection to document managers such as Mendeley, RefWorks, EndNote and scientific social networks such as academia.edu, ResearchGate.

Specialized in educommunication: communication and education, ICT, audiences, new languages...; monographs specialized in current issues. Double format: printed and online; digitally, accessible in full text, free of charge, for the entire scientific community and researchers around the world. Coeditions printed in Spanish and English for the whole world. Published by Comunicar, a non-profit professional association, veteran in Spain (31 years) in education and communication, which collaborates with many international centres and universities.

In active indexations in 2020/21, Comunicar is top in the world: 2nd in the world in Scopus and 13th in the world in JCR (top 1% and 8% in the world; percentile 99% and 92%). In JCR it is Q1 (1st Spanish in Education and 1st in Communication in Spanish). In Scopus is Q1 in Education, Communication and Cultural Studies (1st Spanish); Is 1st in FECYT Métricas and 1st in Dialnet Métricas in Education and Communication, and in Google Scholar Metrics is the 2nd journal indexed in Spanish in all areas and 2nd in REDIB (out of 1,160 journals), .

Web of Science Group JOURNAL CITATION REPORTS · Scopus · FECYT · Google Scholar Metrics · DOAJ · Dialnet Métricas · REDIB · ERIH PLUS · crossref

Sponsored by:

UiO : Department of Education University of Oslo

Universidad Andrés Bello

Universitat de Barcelona

Published by:

Grupo Comunicar
www.revistacomunicar.com
info@grupocomunicar.com
ISSN: 1134-3478 / e-ISSN: 1988-3293