News media framing and the public discourse of digital competences

Enquadramento noticioso e o discurso público sobre competências digitais

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Abstract

In recent years, technological developments associated with a Fourth Industrial Revolution, often seen as disruptive, have accelerated initiatives aimed at training and assessing levels of digital proficiency in different fields of activity. The present study, with a quantitative and longitudinal nature, sought to analyse how the topic of digital competences was framed by the Portuguese press between 2007 and 2020. The results obtained show that digital competences are fundamentally framed under the educational, social and governmental perspectives, the media discourse being led by business representatives and members of national executives. Digital skills are framed by the media discourse as being globally positive and beneficial to society.

Keywords: digital competences, news media framing, society digitization; education.

Resumo

Nos últimos anos, os desenvolvimentos tecnológicos associados a uma Quarta Revolução Industrial, frequentemente vista como disruptiva, têm acelerado as iniciativas dirigidas à capacitação e à avaliação dos níveis de proficiência digital em diferentes campos de atividade. O presente estudo, de caráter quantitativo e longitudinal, procurou analisar a forma como o tema das competências digitais foi enquadrado pela imprensa portuguesa entre 2007 e 2020. Os resultados obtidos mostram que as competências digitais são fundamentalmente enquadradas sob as

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perspetivas educativa, social e governamental, sendo o discurso dos media protagonizado por representantes empresariais e membros de executivos nacionais. As competências digitais são enquadradas pelo discurso mediatizado como sendo globalmente positivas e benéficas para a sociedade.

Palavras-chave: competências digitais, enquadramento noticioso, digitalização da sociedade, educação.

Introduction

Over the past two decades, both in the field of educational policymaking and in the sphere of curriculum development, digital competences and skills have acquired a central position. In the European context, the diagnosis of a digital skills gap and the outlining of a Digital Education Action Plan (2021-2027) (2020) reinforce the evidence of the transversal societal impact of emerging digital technologies, progressively addressed by executive programs of national and regional governments. However, in Europe, the path of digital transformation in education faces challenges, as several recent studies highlight the existence of multi-layered constraints to the development and implementation of digital innovation actions in educational practices (ARAÚJO-VILA et al., 2020; JAHIC; PILAV-VELIC, 2020; VICENTE et al., 2020).

In this article, we address the mediated public discourse on digital competences, assessing its public performance through news media. The premise for this study is that news media framing is a central element in the stabilisation of contemporary sociotechnical imaginaries, as frames facilitate the organisation of core ideas by emphasising certain aspects that allow citizens to identify the relevance of a subject, who is responsible for it, and what measures should be taken.

We present the results of a quantitative content analysis of how the topic of digital competences has been framed by the Portuguese daily and weekly newspapers, weekly newsmagazines, specialized magazines and free daily

newspapers, between 2007 and March 2020. This longitudinal examination is aimed at answering three specific research questions:

RQ1 – What are the dominant news frames in digital competences news coverage?

RQ2 – What are the dominant news sources in digital competences media coverage?

RQ3 – What is the dominant tone in digital competences media coverage?

Results are comprehensively contextualized and discussed in the light of the most recent developments in this field of studies and practice.

Literature review

The definition of the UN's Sustainable Development Goals, in force since 2016, aims to bridge the structural gaps that persist in different parts of the globe and even within different countries. Among them, the promotion of quality education (Goal 4), aiming that, by 2030, it will be possible to "substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship". Currently, one cannot think about education without including training for the use of digital media and technologies, nor without thinking about the importance that those can have in promoting quality educational environments.

In fact, as Schwab (2018) recognizes,

> emerging technologies are changing the way we create, exchange and distribute not only values, but also how we extract meaning - meaning that helps us imagine our possible futures, and what futures are worth living in (p. 67).

For this to happen, there has to be a pedagogical integration of digital technologies and, above all, a perception of the digital skills necessary for these technologies to be used in a way that effectively enhances educational processes. In this sense, it

becomes necessary to understand that digital teaching competences span different aspects, associated not only with an articulation between pedagogy, content and technology, as defined by Mishra and Koehler (2006), but also in the broader context of mobilization of knowledge and attitudes to use digital technologies across professional contexts (DIAS-TRINDADE; FERREIRA, 2020), since it involves knowledge, strategies, skills and awareness of everything that may be needed to work with digital technologies in Education (FERRARI, 2012).

These ideas of a pedagogical use of digital technologies, integrate the value of an education that effectively promotes the students' training for its use, students who were already born in an Era where the digital apparatus had already become a reality, making them skilled users of different digital tools, but who can still lack support to use those very same skills to promote their learning.

It is recognized, therefore, that digital competence in an educational context is not limited to the ability to use digital in for teaching or learning, but should integrate the entire school context, from communication between peers to fostering a digital pedagogical culture among the students.

In this context, the European Commission, specifically the Joint Research Centre department (service dedicated to research and science), has been working, since 2005, to

> provide evidence-based policy support to the European Commission on harnessing the potential of digital technologies to encourage innovation in education and training practices; improve access to lifelong learning; and impart the new (digital) skills and competences needed for employment, personal development and social inclusion. (REDECKER, 2017, p. 7)

From this project, the European Framework for the Digital Competence of Educators was published, in 2017, in which the relationships between teachers' professional and pedagogical competences and students' competences appear in an integrated way and how digital technologies can and should be used to enhance educational processes is explained.

Articulated in six different areas, this framework identifies specific competences for each one and was later adapted to a teacher self-assessment tool, allowing teachers to identify, in each of the areas, their level of digital competence on a six-level scale (From A1 to C2). In addition, the teacher who answers this questionnaire receives feedback with information about his level of global digital competence and in each of the six areas and also suggestions on how he can try to progress to the next level.

There are several other models of digital competences - for example from UNESCO (2008), European Schoolnet (2018), INTEF (2017) or CIEB (2019) -, which with more or less detail also identify areas of digital competences and proficiency levels for each of them.

DigCompEdu has the particularity of, on the one hand, integrating a European Commission project that has been working on digital skills in different areas of society (citizens, organizations, consumers, teachers) and, on the other hand, taking on the importance that teachers are able to assist students in mobilizing digital skills in learning. Redecker (2017) refers that students are growing up in a world where digital technologies are always present, but that does not mean that they know how to use them effectively and consciously (p. 12). In this sense, the author recognizes the "duty" that teachers have to help students to be digitally competent. Thus, and summarizing objective 4 of the UN Agenda for Sustainable Development, it is considered very relevant to integrate a set of digital teaching competences that specifically aim at both training and promoting students' digital competence, in the sense of contribution to an inclusive and quality education and to the preparation of students for a world where digital skills will be decisive to successfully face the challenges that society currently presents.

The importance of this European Commission's framework has been recognized in different countries and the self-assessment tool has already been translated into several languages and studied in different countries. In Portugal, the framework was translated and validated by Dias-Trindade, Moreira and Nunes (2019), and used as a research tool, both in Portugal and in Brazil, with the aim of

mapping digital teaching skills in different institutions and, from the information collected, design training courses dedicated to each of the areas of the framework, in order to allow all teachers to prepare according to their weaknesses and build a training path that allows them to evolve from literacy to digital fluency.

The Portuguese context

On September 18, 2007, the XVII Constitutional Government approved the Technological Plan for Education (Council of Ministers no. 137/2007), considered the largest technological modernization project for Portuguese schools and based on the *Lisbon Strategy*, the *National Strategy for Sustainable Development*, the *Technological Plan* and the *National Strategic Reference Framework 2007-2013*. The Government wanted this project to contribute so that Portugal not only made up for the delays observed but also became among the five most advanced European countries in the technological modernization of education by 2010, so that the school would become "the centre of a network of projects aimed at what really matters: more and better learning and teaching" (Council of Ministers no. 137/2007, p. 6564), thus preparing students for the challenges of the Information and Knowledge Society.

In early 2011, the 18th Constitutional Government approved the *e.escola 2.0* program (continuing the *e.escola* project launched in 2009), meeting the objectives of the European Digital Agenda, which then sought to make the most of the potential of digital resources at the service European economy and society, developing actions in seven areas that are considered problematic and which include the lack of digital literacy and skills.

Always following the European strategy and seeking the training of Portuguese citizens, in particular through actions focused on education, since the focus on training young people will always prove to be fundamental in the medium and long term, different Governments have been introducing strategies only related to the modernization of the Portuguese technological park in general and schools in particular, but also in the sense of training and digital inclusion of all citizens.

This stake is reflected in the project started in 2017 - *National Digital Competences Initiative e.2030, Portugal INCoDe.2030* - to promote a framework of digital competences designed especially for the future and for the opportunities that can emerge from this training, and with a clear commitment to preparing younger generations and responding to three major challenges:

> 1- generalize digital literacy, with a view to the full exercise of citizenship and inclusion in a society with increasingly dematerialized practices, and in which many social interactions take place on the internet and are increasingly mediated by electronic devices.
>
> 2- stimulating employability and professional training and specialization in digital technologies and applications, in order to respond to the growing market demand and to promote job qualification in an economy with greater added value.
>
> 3- ensure a strong participation in international R&D networks and the production of new knowledge in digital areas. (Portuguese Government, 2017, p. 5)

This program has been the main driver of the last Portuguese Governments, which, within the scope of the Ministry of Education, has complemented the expectation of training the largest number of teachers and students in the area of digital skills, especially through the work that has been developed by the Educational Resources and Technologies Team (ERTE), created within the scope of the Directorate-General for Education in 2012.

Already in the context of the COVID-19 pandemic, the Portuguese Council of Ministers approved the Action Plan for Digital Transition, which is assumed to be "the country's transformation engine" (p. 3), and which aims to put into practice a varied set of measures to provide the country's digitization. These measures are organized into three main pillars, the first being dedicated to digital training and inclusion, and which includes digital education and requalification and professional training.

In the scope of digital education, one of the objectives for the training of young people is the "transversal integration of technologies in the different curricular areas of basic and secondary education" (p. 15), thinking of a transversal training,

appropriate to the skills for the 21st century where the role of technology, as already mentioned in 2015 by the World Economic Forum (WEF, 2015), will be fundamental to ensure the social and professional equity of everyone in the world. The sub-pillar referring to requalification and professional training specifies, among the measures to be adopted, teacher training, which, of course, will be essential for there to be an effective integration of technologies in educational practices.

In fact, teacher qualification is essential for an effective integration of Digital Technologies in schools, throughout the educational process, in order to create an integrated culture and aware of the potential that Digital has in the present and future of young students, finding it if the Portuguese Government is committed to following the European reality, aware that digital competences are fundamental to increase the degree of competitiveness of the country.

Method

Data collection and sampling

Our content analysis model adapts the methodological framework of previous empirical studies (e.g. STEPHENS, 2005; ANDERSON et al., 2005; KJÆRGAARD, 2008; GROBOLJSEK; MALI, 2011). In order to consistently identify relevant articles about digital competences in the Portuguese press between 2007 and March 2020, a media monitoring service was used (CISION). With the purpose of narrowing the systematic analysis of media content, four keywords were used in the search process: *digital competences, digital literacy, novas oportunidades,* and *choque tecnológico*. The last two correspond to government initiatives related with digital programs applied to education. The query retrieved a total of 115 hits. Inclusion/exclusion criteria were further applied for consolidation of the sample selection (see Table 1).

Table 1 – Inclusion/Exclusion criteria.

Include	Exclude
Original news articles published between 2007 and March 2020 in Portuguese daily and weekly newspapers, weekly newsmagazines, specialized magazines and free daily newspapers	Original news articles published before 2007 and after March 2020 in Portuguese daily and weekly newspapers, weekly newsmagazines, specialized magazines and free daily newspapers
National circulation news media	Local/regional news media

Source: the authors

The final sample consisted of 113 articles, published over approximately 11 years – since the years of 2012 and 2013 did not return results – and across 33 different news media outlets (see Figure 1).

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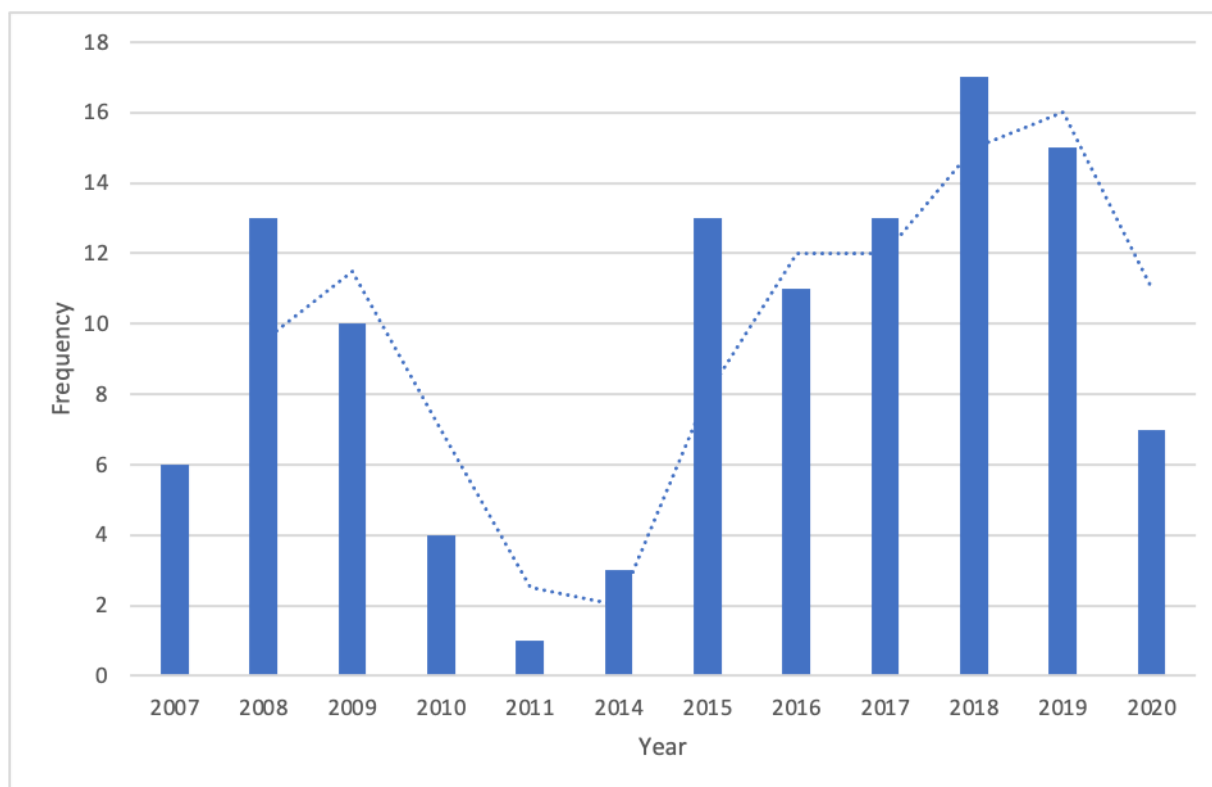
Figure 1: Frequency of Articles by Year, 2007-2020 (*N=113*)

Source: the authors

In order to achieve a comprehensive analysis on digital competences' media coverage, in this study we include national circulation quality press as well as specialized magazines/bulletins and free daily newspapers. These include seven national daily newspapers (*DN, JN, Correio da Manhã, Jornal de Negócios, Jornal i, Diário Económico, Público)*, three national weekly newspapers (*Expresso, Sol, Jornal Económico)*, four national weekly specialized publications (*Semana Informática, Vida Económica, Meios & Publicidade, Dinheiro Vivo*), eight monthly specialized publications (*PC Guia, Exame, Human, Marketeer, Port.com, Pontos de Vista, Executive Digest, HiperSuper*), nine specialized publications with variable frequency, ranging from bimonthly to quarterly (*Comunicações, País Positivo, Market Report, Smart Cities, Dirigir & Formar, Jornal de Letras, Risco, Ingenium, Focus Social)*, and two free newspaper (*Destak, OJE*) (see Table 2)*.*

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Table 2 – Frequency of Articles by News Media Outlet, 2007-2020 (*N=113*)

News Media Outlet	Frequency (percentage)
JN	10 (9%)
Jornal de Negócios	10 (9%)
Público	10 (9%)
Semana Informática	9 (8%)
Expresso	9 (8%)
Vida Económica	8 (7%)
Exame	6 (5%)
Destak	5 (4%)
DN	4 (4%)
Correio da Manhã	4 (4%)
Jornal i	4 (4%)
Dinheiro Vivo	4 (4%)
Market Report	3 (3%)
PC Guia	2 (2%)
Sol	2 (2%)
Comunicações	2 (2%)
Human	2 (2%)
OJE	2 (2%)
Jornal Económico	2 (2%)
Port.com	2 (2%)
País Positivo	1 (1%)
Marketeer	1 (1%)
Diário Económico	1 (1%)
Meios & Publicidade	1 (1%)
Smart Cities	1 (1%)
Dirigir & Formar	1 (1%)
Jornal de Letras	1 (1%)
Risco	1 (1%)
Pontos de Vista	1 (1%)
Executive Digest	1 (1%)

HiperSuper	1 (1%)
Ingenium	1 (1%)
Focus Social	1 (1%)

Source: the authors

Coding

Each article in the sample was analysed using a coding sheet, recording the article headline, year of publication, and news media outlet. Each article was then coded for dominant frame, dominant tone, and primary news source. The contact with the Portuguese media sample led us to an inductive coding process, specifying the coding categories applied to the case study. The objective of coding for the dominant frame was to define the primary focus of the article. Whenever available, four variables were inspected: headline, lead, subheadings and highlight of quotes. The following example, randomly selected, presents the typical analysis of an article:

[Headline]: 'CHANGE THE CHIP. DIGITAL COMPETENCE IS THE WATCHWORD'

[Lead]: 'Digital transition is the opportunity to combat social inequalities, says the prime minister. Competences will have to be transversal to the whole society, because the digital economy impacts people, businesses and governments.'

[Subheadings]: N/A
[Highlight of quotes]: N/A

Both the headline and the lead stress the transversal implications of digital competences, advancing an argument towards "the opportunity to combat social inequalities". Based on these findings, the article was coded in the dominant frame *Social Implications*. Since the process of coding is permeable to subjective judgments and interpretation, an intercoder reliability check was implemented for

dominant frame, dominant tone, and primary news sources, using the Intraclass Correlation Coefficient (ICC) in SPSS V23 statistic software, checking absolute agreement in a confidence interval of 95%. The objective of these tests is to verify if ratings by different coders do reflect the dimension they are purported to reflect. Coder A and Coder B coded the full sample (*N*=113) independently for *frame*, *tone*, and *primary news source.* Both coders are fluent in Portuguese and English. An interrater reliability test was performed comparing the coding results of coders A and B. The ICC for the frame variable was of ,969 (in a 95% confidence interval, with a lower bound of ,962 and an upper bound of ,974). The ICC for the tone variable was of ,961 (in a 95% confidence interval, with a lower bound of ,953 and an upper bound of ,968). Finally, the ICC for the primary news source variable was of ,985 (in a 95% confidence interval, with a lower bound of ,981 and an upper bound of ,987). Since the two coders did not agree in absolute terms, a reconciliation procedure was implemented in order to resolve the discrepancies: the differences in coding were identified by the research team, with the two coders returning to the original articles and comparing together the previously assigned codes with the specific descriptions articulated in the coding scheme. This procedure allowed for a collegial consensus-building.

Results and discussion

Dominant news frames in digital competences media coverage

Between 2007 and 2020, there has been a great focus on education for digital competences, being that the specific focus of 28% of the results obtained, followed by articles related to social implications (23%) and government initiatives (19%), as demonstrated is Table 3. In the period under analysis, news media coverage shows that the theme of digital skills has been consolidated in the Portuguese public sphere: the aggregated values between education for digital skills and their social

implications represent 51% of the sample. These results accompany the launch and/or consolidation of a set of public investment initiatives in this field (19%).

Table 3 – Dominant news frames, 2007-2020 (*N=113*)

| Dominant Frame	Description	Frequency (percentage)
Education	Focus on skills' gap, the need for new technical qualifications, and the creation of new academic/training programs	32 (28%)
Social Implications	Focus on broad consequences of digital technologies and competences for society (e.g. inequality)	26 (23%)
Governmental program	Focus on executive programs (e.g. investment in digital equipment and infrastructures)	21 (19%)
Business and Management	Focus on portraying portuguese companies (e.g. tech companies), start-ups, CEOs, managers and entrepreneurs	17 (15%)
Economic Impact	Focus on specific economic implications of digital competences, namely on the work sector, workforce and (un)employment, competitiveness and internationalization	14 (12%)
Funding	Focus on private and/or public funding, from Portuguese and EU sources, to digital competences and digitalization (eg. Prizes)	3 (3%)

Source: the authors

In fact, in its 2015 official program, the 21st Portuguese Government, acknowledged the importance of reinforcing the investment in science and technology. Assigning a key role to the strengthening of human capital, the Portuguese Government also set a program aimed at preparing the Portuguese society for the Digital Age, through Portugal INCoDe.2030, launched on 2017,

focusing on putting to work together in a transversal way, different governing areas such as administration, science, technology, education, infrastructures and economy. Recently, the government's digital action plan, from March 2020, reinforces the need for the digital training of citizens, businesses and the Government itself and new priorities have been defined. A specific plan for education is in place, "aiming at the continuous improvement of the quality of learning and the innovation and development of the education system, empowering children and young people with the digital skills necessary for their full personal and professional achievement, as well as equal opportunities in access to quality digital educational equipment and resources and investment in the digital skills of teachers" (MINISTRY OF ECONOMY AND DIGITAL TRANSITION, 2020, p. 15), articulated with the development of digital competences in society at large, recognizing that digital technologies will have widespread consequences for the functioning of society and that it is necessary for the Government to develop programs that, as demonstrated by Portuguese news coverage, promote investment in digital equipment and infrastructures, as well as ensuring digital literacy and inclusion for the exercise of citizenship.

Dominant news sources in digital competences media coverage

Our findings make it clear that, in Portugal, the mediated public discourse on the topic of digital competences has been particularly portraying business representatives (26%) and national government officials (22%), which is in accordance with the previously mentioned findings at the level of dominant news frames. Aggregated, those news sources are present in 48% of the sampled news coverage. It is striking to notice the comparatively low presence of teachers and scientists (7%). Accordingly, the results from our study suggest that the mediatization of digital competences, in the period from 2007 to 2020, despite not being monolithic, was mostly constructed from business companies and state policymaking perspectives, and less from the prism of educators, families and other social agents, absent from media discourse (Figure 2).

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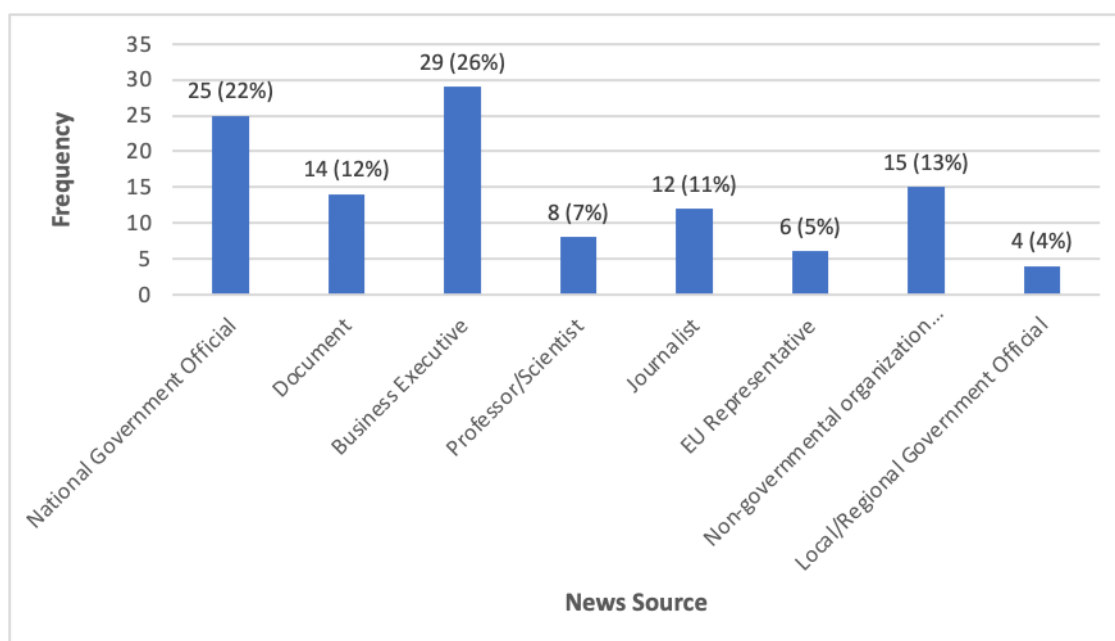
Figure 2: Frequency of primary news source, 2007-2020 (*N=113*)

Source: the authors

Dominant tone in digital competences media coverage

In the light of our analysis on the dominant frames and news sources, it comes with no surprise that the majority of the sampled news articles (78%) expresses a positive/beneficial view on digital competences, on the need for the Portuguese society to develop these competences and on its positive influence for society in general (Figure 3). Complementarily, from our sample, no article was coded as expressing more risks than benefits coming from digital competences and the associated policies. In fact, the studied news coverage greatly follows the institutional and governmental projects that have been focusing on the digitization of Portuguese society, as well as the awareness that an education for digital skills is a key move for a present and a future where digital environments are increasingly articulated, indistinctly, with analogue ones (FLORIDI, 2015; SHWAB, 2018). These articles recognize the positive impacts that this digitization may have on Portuguese society

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in general and regarding the economy itself as an opportunity to overcome historical social-economical gaps and as a way to enhance Portuguese competitiveness in the European region.
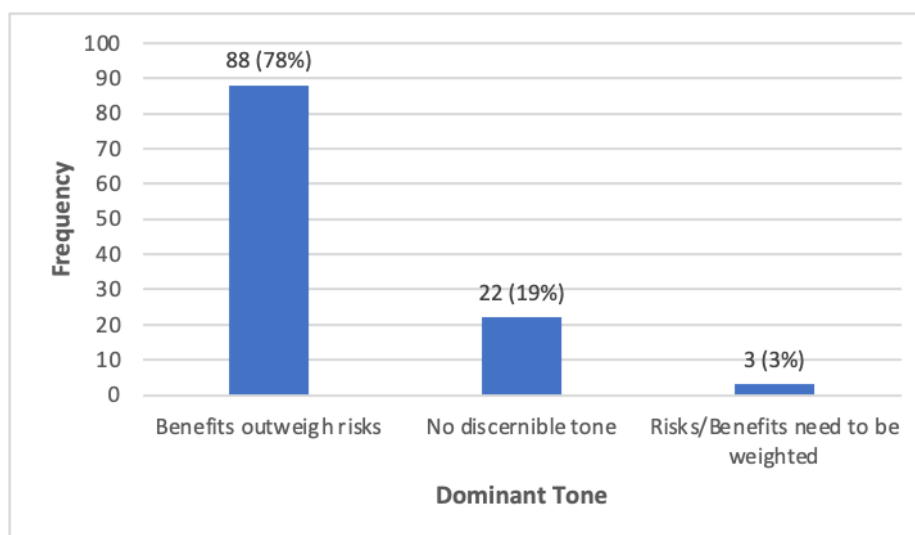
Figure 3: Frequency of articles by risks and benefits associated with digital competences, 2007-2020 (*N=113*)

Source: the authors

Conclusion

The digitization of Portuguese society has been assumed as fundamental to the progress of the country, and considered necessary in the most varied areas, both personal and professional. Analysing the results that have emerged on the subject in the Portuguese press since 2007 - the year in which the *Technological Plan for Education* was introduced – (currently replaced by the *Digital School Plan* that integrates the Government's *Action Plan for Digital Transition*), the focus seems to be on promoting the digitization of Portuguese society through Education and mainly enhanced by governmental projects and initiatives that have been put under way. In 2015 the World Economic Forum referred to the importance of governments in developing public policies as a strategy for countries to remain competitive and able

to meet the demands of the labour markets of the 21st century (WEF, 2015). Also, as Bettinger (2020) recognizes, digital technologies are "essential to the functioning of our society and economy" (online). This effort is shown in the Portuguese press, where different actors reflect and explain the importance of Government projects that intend to create the conditions for the Portuguese society to adapt to digital environments, both at school and in different areas of the Portuguese society.

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