Sustainable Technology and Entrepreneurship

https://www.journals.elsevier.com/sustainable-technology-and-entrepreneurship

Full Length Article

Media or information literacy as variables for citizen participation in public decision-making? A bibliometric overview

Vicente Guerola-Navarro*, Doina Stratu-Strelet, Dolores Botella-Carrubi, Hermenegildo Gil-Gomez

Department of Business Organization, Universitat Politècnica de València, Spain

ABSTRACT

Internet has become a new way of communication leading the transformation of the use of conventional communication though digital platforms, bringing a new paradigm in human interaction (Saputra et al., 2020) but having Internet access does not mean that citizens are using Internet effectively and successfully, at least for participating in public decision-making. The disruption of information and technology development without creating a media and information literacy as part of the digital education, create a phenomenon that is worrying for the sustainability of society. In critical areas for society such as entrepreneurship, this phenomenon is critical and highly determining. This paper analyses the Media and Information literacy applied to citizen participation theoretical framework through a quantitative Bibliometric Overview of the most important studies in the field. The main objective is to present a general overview of the selected research areas, determining which of both areas is more explored from the point of view of how these literacies are used to reach citizen participation in public decisions, with a clear link to business decisions linked to entrepreneurship.

Introduction

The presence of fake news (hoaxes), hate speech, verbal abuse, acts of intolerance are spreading on media sector as consequence of the digitalization of citizen activities and life, creating new patters in citizen participation within the society's structure. According to Bawden (2008) the term digital literacy is referring to the technical skills of accessing, understanding, and disseminating information. Saputra and Siddiq (2020) after a revision of digital literacy term, concluded that digital literacy is a set of knowledge and abilities possessed by individuals in understanding, evaluating, using information obtained by prioritizing ethics to communicate and interact in daily life. These abilities are needed by the citizen to face the challenges that the Information Society is bringing to the 21st century imposing the creation of a 'Digital Citizenship' to overcome them (Ribble et al., 2007).

Specifically, Media and Information Literacy includes the *'abilities to recognize the need for information and knowing how to access, evaluate and synthesize and communicate'* (Moeller et al., 2011) and the *'abilities of critical analysis of a wide variety of forms, such as print, audio, video and multimedia'* (Hobbs et al., 2013). Choi (2016) determines from its conceptual analysis of the joint term (Media and Information Literacy) that there are three primary sub-themes as the main concerns of it: digital access (as a main component to full the participation in online societies), technical skills (which represents an instrumental perspective on literacies and competencies, such as how to use new digital technologies, computers...) and psychological capabilities (such abilities as how to asses information, critically read and write online and express themselves online beyond simple technical proficiencies.

In this article the terms are initially analysed in separately mode: on the one hand the term 'Media Literacy' will be analysed, on the other hand will be the term 'Information Literacy'. Once the terms have been analyzed separately, this study tries to find the link between them and decision-making in the world of entrepreneurship.

The focus of this article is to cover the gap with the current literature with practical research directly linked to its application to the world of entrepreneurship, where Media Literacy and Information Literacy are key variables for citizen participation in Public Decision-Making. The main goal is to determine thought a bibliometric comparative overview which of both areas is more explored from the point of view of how these literacies are used to reach citizen participation in public decisions, considering if this conceptual framework

* Corresponding author.
E-mail address: viguena@upv.es (V. Guerola-Navarro).

has or not any implication on entrepreneurship field. Furthermore, another research main goal is to detail the main bibliography in the field to provide unique information in these specific subject areas, allowing other researchers to use this analysis to develop its own studies considering the most relevant information which could facilitate its work (most cited journals and articles, most important authors, most important universities in the field, etc).

In the following sections, the conceptual framework in which this study is developed is defined, through an extensive literature review in this field of study that is not yet very developed. Next, the methodology followed is explained, in this case that of a mostly quantitative bibliometric study but with a complementary qualitative analysis. Finally, the results and the final conclusions to which these results give rise are presented.

Literature review

The emerge of fake news, misinformation, and other forms of inaccurate content flow constantly over digital platforms (Silverman, 2015), creating a phenomenon that has a considerable impact on the perceived credibility of the media systems and democracy (Jenkins et al., 2013, p. 2). In digital culture, the information exchange is emerged because of the intersection of people, technology and practice which create networked social relationships benefiting from social networks that are designed to support persistence, visibility, spread ability and searchability (Boyd, 2014). In this situation the online media has a legitimation crisis being part of a landscape where the online news is more part of the problem of online misinformation that they are the solution (Kellner, 2003). The online media is subjected to different demands (economic, technological, political, and social) joined with the need to be constantly present, reporting with equal speed and enthusiasm with the final goal of gaining more followers. The individuals may not only lack the ability to recognize and evaluate misinformation but also may have a lack of motivation (Scheufele & Krause, 2019). There is a very limited research base on how this environment could change and in this context is incipient the promotion of different literacies as the competencies which provide citizens with skills to navigate in the ubiquitous information age.

Media literacies is related with the ability to deconstruct and analyse media texts, to create and produce message and to engage and participate meaningfully in civic dialog (Aufderheide & Firestone, 1993; Buckingham, 2003; Hobbs et al., 2013; Mihailidis and Viotty, 2017). Media literacy can be a critical variable in young people civic participation or engagement in politics, news and social issues (Ashley et al., 2013; Kahne & Bowyer, 2016; Hobbs et al., 2013). According to Mhailidis et al. (2017) media literacies have to be deliberately civic, and apolitical because the movement has to teach about media's role in society, and specifically focusing on civic impact: as the media can be used to influence, at realistic scale, the political, social, and cultural issues that are part of our democracy system. Democratic process loss its legitimation when individuals are distracted or unable to judge the truthful of political policies. The circulation of misinformation undermines the decision making and informed action while delegitimizing the promise of deliberation, increasing both in a correlated way the exposure to misinformation and the necessity to prepare citizen to assess the accuracy of truth (Kahne & Bowyer, 2016). Potter (2010) determines that it is increasing in the academia the number of scholars that are attracted to study the role of media literacy, especially how media literacy interventions can achieve more positive goals that will not only help citizen avoid negative effects of media exposures but also enhance the positive effects. The main need to empower citizens in the media field aims to reactivate civil society within deliberative democracies committed to human development (Gozálvez-Pérez et al., 2014). Educating for media citizenship is a way or empowering citizenship in hyper communicated pluralistic

and democratic societies. In this regard, empowering citizens means reinforcing its freedom, its critical autonomy and its direct participation in political, social, economic, ecological, and intercultural issues based on the good use of the media and communication technology (Gozálvez-Pérez et al., 2014). This requires cultivating and educating in the necessary skills for a wide and complete use of communication media and technology. Kahne & Bowyer (2016) explained that in the political and legal field, the Internet is being configured as a platform that allows direct and citizen participation in different national and international issues.

Cortina (2004:2010) affirms that it is essential to cultivate the 'public use of reason' and to this effort the media can serve as an expression of a human social activity, with legitimate goals that will help the contribution for the media to the creation of ta mature and responsible public opinion. The main objective it to prevent the information society from becoming a society of ignorance (Brey et al. 2009; Gozálvez-Pérez et al., 2014). For the mentioned authors (Brey et al. 2009; Gozálvez-Pérez et al., 2014), in the Information Society the citizens are permanently subjected to an enormous amount of information, and because of a lack of adequate skills to well-process this information, they adopt an attitude of renunciation of knowledge due to a lack of motivation and a tendency to accept the ready-made view of social reality. The Paris Agenda (2007) of UNESCO stated that media education contributes to the empowerment of people and a shared sense of responsibility in society, such, forms of citizenship and human rights. Thus, in democracy there is a need of educating in the notions of participation, public commitment and social responsibility, notions that require that dynamic and open communicative space. Public opinion in democracy must be critical, deliberative, and reflexive and the media has an important role in achieving this goal (Greppi, 2012: 16-36).

The second term to be analyzed in this Literature Review, is the Information Literacy. The first time that the term was used was by Zurkowski the President of Information Industry Association in 1974 (Zurkowski, 1974). The National Forum on Information Literacy defined the phrase as 'the ability to know when there is a need for information and to be able to identify, locate, evaluate and effectively use that information for the issue or problem that at hand' (Ferguson, 2005). It is referring to the capacity for using information communication technology as means to reach personal and professional goals (Lee et al, 2020) including abilities to recognize and local needed information (Choi, 2016). The term was used in different studies from various disciplines: consumer studies, medical research, finance, business, information management, higher education, and public administration (Lee et al, 2020). Information Literacy is vital for, among others, citizens (Kolle, 2017) and numerous authors had highlighted the significance of that in our era (Mulla, 2014; Parvathamma and Pattar, 2013; Shoeb, 2011; Ubogu, 2011; Wang, 2011). Nonetheless, academics frequently fail to identify the types of knowledge and skills that allow to think critically and act responsibly below general discussion of effective use of the Internet and technology (Choi, 2016).

There is a need for a broader development of participatory citizenship though digital technology building on democracy principles. According to Choi (2016), users who feel a high cognitive overload show an increased frustration while using a website, increasing the negative effects of the usefulness for trust in information technology. The information literacy is a very studied topic by many academics, for example Tewell (2015) analyze the main theories of critical pedagogy and critical approaches to information literacy, concluding that when we limit information literacy's potentials, we run the risk of minimizing the complex situatedness and diminishing its inherent political nature. Emerging digital media and web-based networking environments allow people to adopt new perspectives (Tapscott, 2008) and many scholars have started to consider Internet as a space to empower individuals to actively engage in civic life going beyond

traditional conceptions of citizenship (Choi, 2016; Banaji & Buckingham, 2013; Makinen, 2006). For those reasons, this research is aimed to understand research trends both in Media Literacy and Information Literacy, by using bibliometric methods.

Having analyzed which is the conceptual framework in which Media Literacy and Information Literacy develop independently, this study intends to go further and analyze which is the conceptual framework in which both types of Literacy interact with decision making and, especially with entrepreneurship and the importance of the process of decision making in the first years of business creation. Shepherd et al. (2015) analyzes and demonstrates how, in the field of entrepreneurship, making business decisions based on good management information is even more critical, for which Literacy is one of the variables with the most notable influence. Uncertainty, decision making, and entrepreneurship are therefore intimately related, since they largely mark the future of a good business idea through the decisions made in the first years of the company's existence (Choi, 1993). In this study, we intend to analyze whether the relationship between these concepts referring to Literacy in the field of Media and Information are determining factors in the establishment of a conceptual framework that guarantees that decision-making will be successful in the world of entrepreneurship.

Methodology: a bibliometric overview

Research questions

The study is expected to answer the following research questions:

- What is the annual grown rate of Media and Information Literacy during until 2022?
- What are the main trends in Media and Information Literacy for attributes such as country of publications, subject area, and highly cited journals?
- Who are the most productive authors in Media and Information Literacy discipline and their affiliations?
- What are the top journals publishing Media and Information Literacy literature and the number of citations received by them?

Background of the bibliometric analysis applied to the Information and Media Literacy

Bibliometric analysis classifies bibliographic material quantitatively, becoming popular in the last year to assess the state of the art of a scientific discipline (Merigó et al. 2016).

Initially, the term of a Bibliometric analysis was mentioned by Koos (2019) as *'the application of mathematical and statistical methods to books and other means of communication'* (Mulet-Forteza et al. 2019). According to Duriuex and Gevenois (2010), 'Bibliometric studies are increasingly being used for the research assessment of a particular area of research (Singh et al., 2007), or person or organization (Maharana, 2013) or country (Zhu and Willet, 2011). Also, according to the mentioned author there are three types of bibliometric indicators: quantity indicators (which measures the productivity of a particular researcher), quality indicators (which measures the quality or performance), and structural indicators (which measures connections between publications, authors and areas or research.

This kind of analysis provides a general picture of a research area, being very useful in identifying the most influential research and the main trends over time (Guerola-Navarro, 2020).

A lot of disciplines are using bibliometrics for stating the current trends and the prospects, even in the mentioned topic. For example, Pinto et al., (2019) has analyzed the scientific production on mobile information literacy in higher education though a bibliometric analysis to identify the most relevant journals that publish literature in

this field, to calculate the authors' average productivity and discover the most significant trends in the academic field. Koos (2019) similarly has analyzed with the same methodology the Information Literacy Literature in the Social Science and Humanities to create a detailed map, determining the scope and distribution of information literacy research documents. Kolle (2017) also analyzed the Global research on information literacy, determining among other, that there are two other popular phrases in this field that is used at the same level: Media literacy and Digital Literacy. This analysis validates the initial definition used in this research that includes both terminology (Media and Information Literacy).

In this paper, the most influential studies in the theoretical framework of information literacy and media literacy will be presented through a bibliometric analysis as a quantitative study of bibliographic data (Merigó et al. 2016). The main objective is to create a general picture in the above-mentioned research areas. This analysis will be presented in different parts: first the most cited articles and authors of Information literacy and Media Literacy fields applied to citizen participation; next the most influential journals and universities will be presented; ending with the analysis of the most influential countries in this area.

Studying and reviewing the literature on this specific topic gives an overview of the tendencies (Vicedo, et al. 2020; Anguinis et al.2012; Pilkington and Meredich, 2008; Gil-Gomez et al., 2021; Guerola-Navarro et al., 2021), especially regarding the possibilities of the future research to be carried out. Hence, this study uses the Web of Science Core Collection (WoS) data (Merigó et al. 2016) as a reference database considered the best academic database for analysing research contributions (Shiau, 2015). WoS database is constantly incrementing, consequently the analysis considers a static picture of the existing publications by June 2020, contemplating natural years.

Since our study focuses on 'Media and Information Literacy', the selected key words are the search criteria used in the 'Web of Science Core Collection'. Two different scenarios and search criteria will be analyzed comparatively to reach a better understanding of which of both perspectives are more used in the academia studies for citizen participation. The first scenario integrates the following search criteria: 'Media' & 'Literacy'& 'Citizen'. The second scenario integrates the search criteria: 'Information' & 'Literacy'& 'Citizen'. To validate the uniqueness of our article a quick search of the selected criteria in the mentioned database has been made adding the bibliometric methodology criteria; not results were found. Even though, as introduced in the abstract, Entrepreneurship is key in this study, it has been observed that the introduction of the search criterion "entrepreneurship" does not bring any change in the results that the Web of Science returns in the successive requests for results. That said, and despite the fact that "Entrepreneurship" does not generate specific outputs in the Web of Science search results, this key variable will be considered as future research hypothesis in the applicability of the conclusions.

As for the time criteria, the entire range available from the beginning of the time to 30th June 2022 is considered. In the reference to the types of publication, only the "Article" type of documents will be analyzed to get consistent conclusions and not to duplicate results (Merigó et al. 2016).

The first scenario (Media + Literacy+ Citizen) obtains a total of 358 results. The second scenario (Information + Literacy+ Citizen) obtains a total of 535 results. The first deduction that can be drawn is that the relationship between citizen participation in Democracy and different literacy related to better handling the online information, is more analyzed from the point of view of the Information Literacy than Media Literacy.

As this study aims to analyze the global historical of publications regarding the Media and Information Literacy it is not considered appropriate to refine results by eliminating categories proposed by WoS.

V. Guerola-Navarro, D. Stratu-Strelet, D. Botella-Carrubi et al.

Sustainable Technology and Entrepreneurship 2 (2023) 100030

To be able to treat the data in such a way that there were no variations during their analysis, they have been extracted through the functionality that the WoS provides. It has not been necessary to resort to any specific management software for these data because their magnitude has allowed them to be processed using spreadsheets functionality from an office suite.

Results

The following sections present findings of the Bibliometric analysis including the total number of publications, number of citations receiver by them, prolific information authors and their affiliations, distribution by subject area, country, top journals publishing Media and Information literacy articles and journals receiving the highest number of citations.

Number of media and information literacy literature

Media literacy-citizen

Information literacy-citizen

Comparative results
   The first conclusion obtained is that the interest in the topic has been increasing since 1993 in both areas (Media and Information Literacy). Regarding Media Literacy centered in the citizen participation: the studies in practices that allow citizen to access, critically evaluate and create media have taken off from 2008 until 2021 (even same tendency in the period analyzed for the first half of 2022). The same tendency exists with Information Literacy. Both graphics
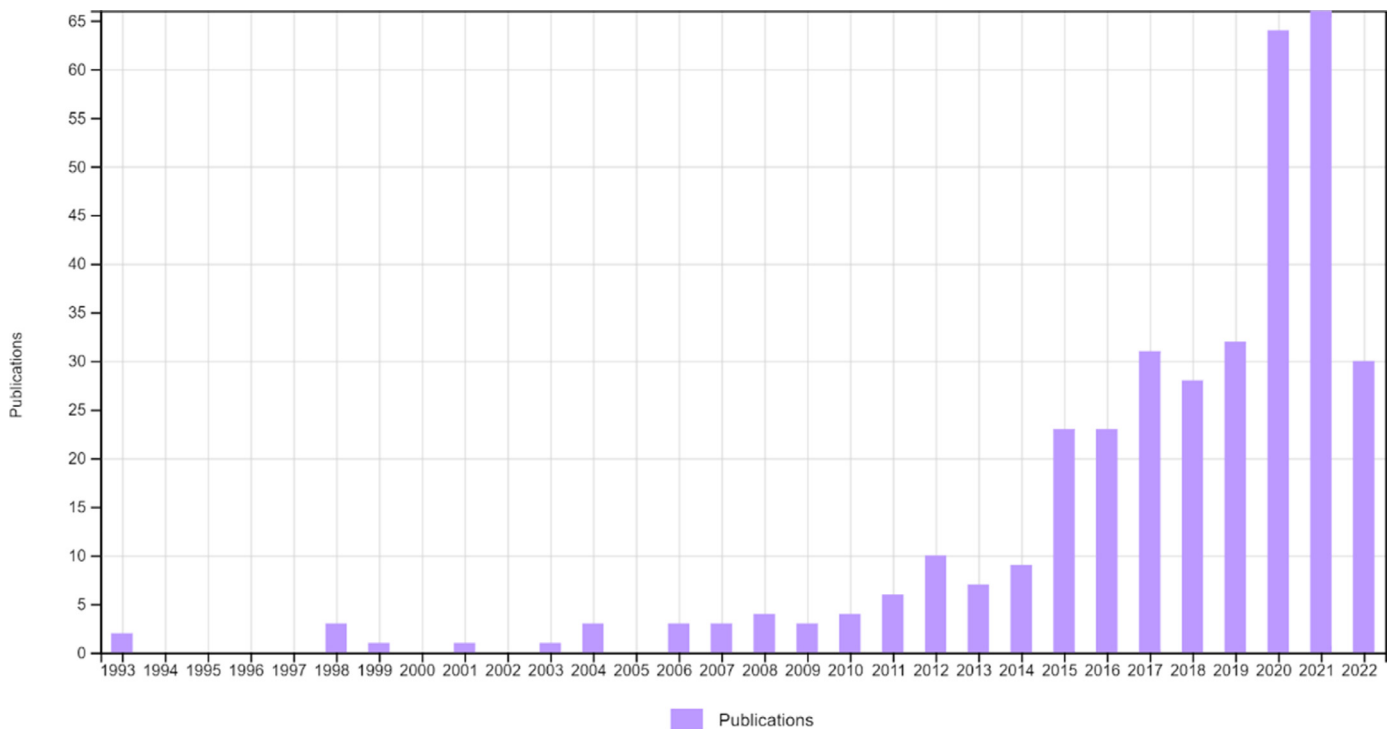
Sum of Times Cited per Year
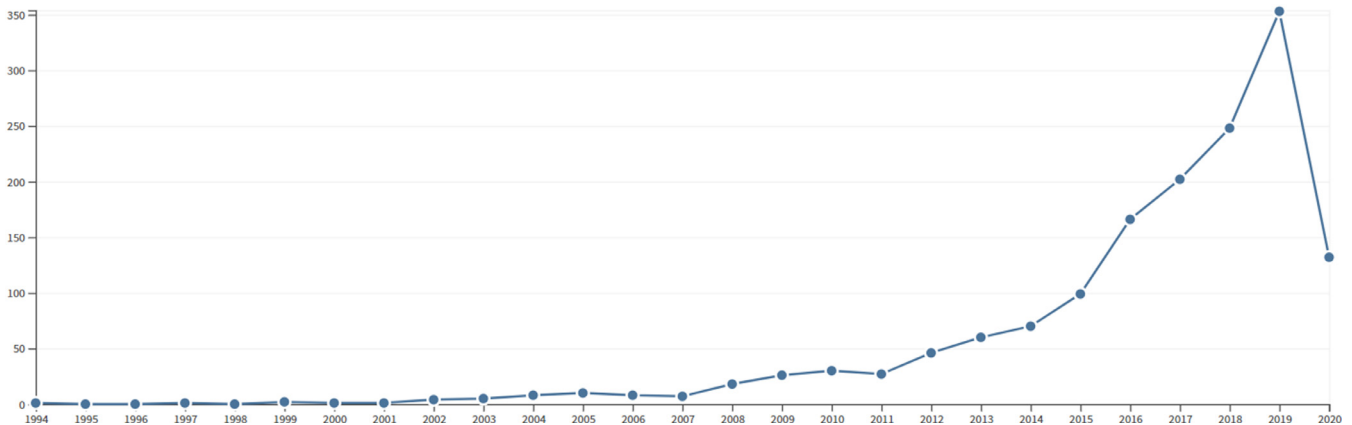
Fig. 1. The growth of media literacy publications and citations over years (respectively)Source: Web of Science.

Table 1
Number of citations received by media literacy publications over years.

CITATIONS	ALL TIME		2015 - 2022	
	NUMBER OF PAPERS	**% PAPERS**	**NUMBER OF PAPERS**	**% PAPERS**
> 200 CITATIONS	1	0,279	1	0,335
> 100 CITATIONS	7	1,955	4	1,342
> 50 CITATIONS	13	3,631	6	2,013
> 20 CITATIONS	43	12,011	25	8.389
<= 20 CITATIONS	294	82,122	262	87.919
TOTAL	358	100,000	298	100,000

Source: Web of Science

Fig. 2. The growth of information literacy publications and citations over years (Respectively)Source: Web of Science.

V. Guerola-Navarro, D. Stratu-Strelet, D. Botella-Carrubi et al.
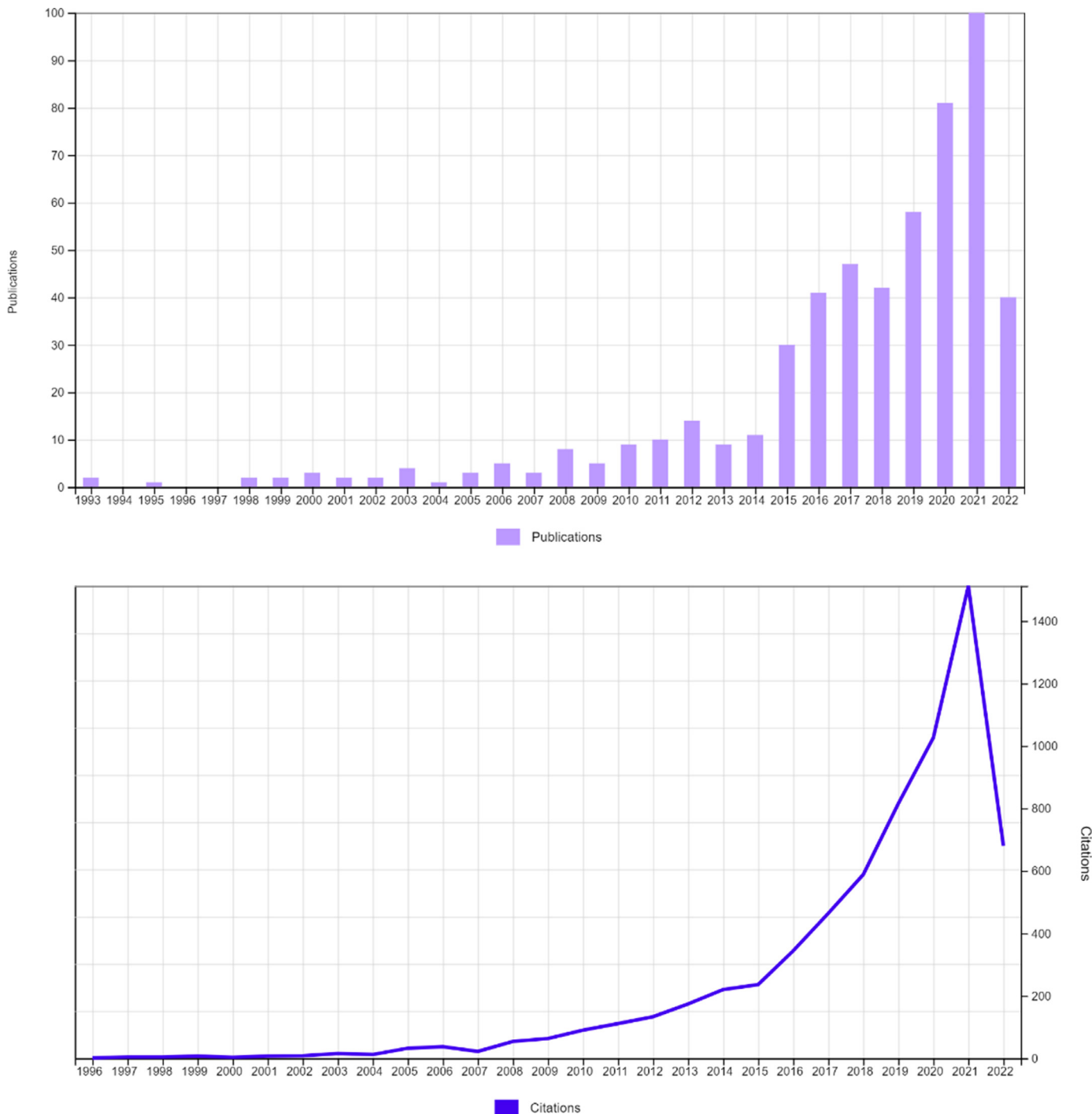
Sustainable Technology and Entrepreneurship 2 (2023) 100030

Table 2
Number of citations received by information literacy publications over years.

CITATIONS	ALL TIME		2015 - 2022	
	NUMBER OF PAPERS	% PAPERS	NUMBER OF PAPERS	% PAPERS
> 200 CITATIONS	2	0,373	2	0,455
> 100 CITATIONS	14	2,616	6	1,366
> 50 CITATIONS	30	5,607	16	3,644
> 20 CITATIONS	70	13,084	42	9,567
<= 20 CITATIONS	419	78,317	373	84,965
TOTAL	535	100,000	439	100,000

Source: Web of Science

(Figs. 1 and 2) show the youth of both perspectives. In both cases, it is in 2008 when an exponential growth in the interest of the subject is appreciated, being very timid the advances prior to the mentioned year. For that reason, in the tables integrated in this study a lower productivity and influence measurement values could be observed. To verify these statements, the Tables 1 and 2 are presented to check the temporal evolution of the citations for the papers. In Table 1 the number of the citations in which this bibliometric study begins to be significant is 20 citations, since from 20 citations the number of papers decreases greatly; the same path is found in Table 2.

Most prolific media and information authors

Media literacy-citizen
Table 3

Information literacy-citizen
Table 4

Comparative results

The rank is elaborated based on the number of publications and citations of the authors who have researched in Media and Information Literacy applied to engage citizen participation. For the study, it is considered just the authors with 2 or more papers published, attending to relative relevance criteria (Merigó et al. 2016). The Tables 3 and 4 details de results of the study.

The maximum number of publications per author is very low in both cases. Among all authors, those with more citations have been selected: from Table 3 the most cited is MIHAILIDIS, P., from USA with 221 citations, which can be considered the most influential in the field of Media Literacy used for improving citizen participation. From Table 4 the most cited is GAL, I. from ISRAEL, also can be

Table 3
Top authors (with more than 1 publication) in the field of media literacy-citizen perspective.

RANK	NAME	INSTITUTION	COUNTRY	TP	TC	TC/TP	H-INDEX	>= 20	>= 10	>= 5
1	Garcia-Ruiz, R	Universidad Antonio de Nebrija	SPAIN	7	114	16,29	3	1	1	3
2	Aguaded, I	Universidad de Huelva	SPAIN	7	84	12	3	1	3	5
3	Mihailidis, P	Emerson Coll	USA	4	221	55,25	3	2	2	3
4	Romero-Rodriguez, LM	Universidad Rey Juan Carlos	SPAIN	4	101	25,25	3	2	3	3
5	Allchin, D	University of Minnesota System	USA	3	5	1,67	1	0	0	1
6	Levitskaya, A	Taganrog Inst Management & Econ	RUSSIA	3	16	5,33	2	0	0	2
7	Perez-Escoda, A	Universidad Antonio de Nebrija	SPAIN	3	40	13,33	3	1	1	3
8	Perez-Rodriguez, A	Universidad de Huelva	SPAIN	3	49	16,33	2	1	2	2
9	Bonilla-del-Rio, M	Universidad de Huelva	SPAIN	2	13	6,5	2	0	1	1
10	Contreras-Pulido, P	Universidad de Huelva	SPAIN	2	49	24,5	2	2	2	2
11	de-Casas-Moreno, P	Universidad de Huelva	SPAIN	2	1	0,5	1	0	0	0
12	Fedorov, A	Rostov State University of Economics	RUSSIA	2	16	8	2	0	0	1

Source: Web of Science

Table 4
Top authors (with more than 1 publication) in the field of information literacy- citizen perspective.

Rank	Name	Institution	Country	TP	TC	TC/TP	h-index	>= 20	>= 10	>= 5
1	Aguaded, I	Universidad de Huelva	SPAIN	5	68	13,6	2	1	2	2
2	Garcia-Ruiz, R	Universidad Antonio de Nebrija	SPAIN	4	11	2,75	2	0	0	1
3	Diviani, N	Universita della Svizzera Italiana	ITALY	3	75	25	2	1	2	2
4	Gal, I	University of Haifa	ISRAEL	3	266	88,67	2	1	1	1
5	Romero-Rodriguez, LM	Universidad Rey Juan Carlos	SPAIN	3	98	32,67	3	3	3	3
6	Andersen, B	Aarhus University	DENMARK	2	14	7	2	0	1	1
7	Arevalo, JM	Universidad Peruana Cayetano Heredia	PERU	2	0	0	0	0	0	0
8	Bates, AJ	Nottingham Trent University	UK	2	34	17	2	1	2	2
9	Belluzzo, RCB	Universidade Estadual Paulista	BRAZIL	2	1	0,5	1	0	0	0
10	Brainin, E	Ruppin Acad Ctr	ISRAEL	2	17	8,5	2	0	1	1
11	Choi, K	Ewha Womans University	SOUTH KOREA	2	141	70,5	2	2	2	2
12	Costa, SMD	Universidade de Brasilia	BRAZIL	2	11	5,5	2	0	0	1

Abbreviations: R = Rank; Name = Name of the Journal or Source Title; h = h-index; TC = Total Citations; TP = Total Papers; TC/TP = ratio total Citations per Published Paper; >100, >50, >25, >10 = number of papers with more than 100, 50, 25, 10 citations; IF = Impact Factor 2018; 5-IF = five-year Impact Factor 2018.
Source: Web of Science

Table 5
Top higley cited articles in the field of media literacy- citizen perspective.

JOURNAL	RANK	TC	TITLE	AUTHOR/S	YEAR	CITATIONS PER YEAR
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	1	216	Science audiences, misinformation, and fake news	Scheufele, DA and Krause, NM	2019	54
AMERICAN BEHAVIORAL SCIENTIST	2	140	Spreadable Spectacle in Digital Culture: Civic Expression, Fake News, and the Role of Media Literacies in "Post-Fact" Society	Mihailidis, Paul; Viotty, Samantha	2017	23,33
LEARNING MEDIA AND TECHNOLOGY	3	117	Digital literacy and informal learning environments: an introduction	Meyers, Eric M.; Erickson, Ingrid; Small, Ruth V.	2013	11,7
JOURNAL OF MEDICAL INTERNET RESEARCH	4	112	Framework for Managing the COVID-19 Infodemic: Methods and Results of an Online, Crowdsourced WHO Technical Consultation	Tangcharoensathien, V; Calleja, N; (...); Briand, S	2020	37,33
PUBLIC UNDERSTANDING OF SCIENCE	5	112	Understanding citizen perceptions of science controversy: bridging the ethnographic-survey research divide	Nisbet, Matthew C.; Goidel, Robert K.	2007	7
THEORY AND RESEARCH IN SOCIAL EDUCATION	6	111	Can Students Evaluate Online Sources? Learning From Assessments of Civic Online Reasoning	cGrew, S; Breakstone, J; (...); Wineburg, S	2018	22,2
JOURNAL OF BROADCASTING & ELECTRONIC MEDIA	7	109	The State of Media Literacy	Potter, W. James	2010	9,08
COMUNICAR	8	98	Media Literacy Education for a New Prosumer Citizenship	Garcia-Ruiz, Rosa; Ramirez-Garcia, Antonia; Rodriguez-Rosell, Maria M.	2014	10,88
EUROPEAN ECONOMIC REVIEW	9	87	Political agency, government responsiveness and the role of the media	Besley, T; Burgess, R	2001	3,95
JOURNAL OF COMMUNICATION	10	80	The struggle over media literacy	Lewis, J; Jhally, S	1998	3,2

Source: Web of Science

considered as the most influential in the field of the Information Literacy used for improving citizen participation.

The first conclusion is that the authors with the most publications are mainly from Spain in both Tables (GARCIA-RUIZ, R; AGUADED, I; ROMERO-RODRIGUEZ, LM). Only in the case of Media Literacy there is MIHAILIDIS, P from USA with more than 3 publications. It also remarkable that in the Table 3-Media Literacy, the authors with more published papers are from Europe (8) versus the rest of the international community (4). In contrast, Table 4 shows a much more equilibrated situation, with same number of authors from Europe (6) and from international community (6).

The general conclusion is that there is a majority tendency to study this type of literacies in Europe, and especially in Spain.

Highly cited articles

Media literacy-citizen
 Table 5

Information literacy-citizen
 Table 6

Table 6
Top higley cited articles in the field of information literacy- citizen perspective.

JOURNAL	RANK	TC	TITLE	AUTHOR/S	YEAR	CITATIONS PER YEAR
INTERNATIONAL JOURNAL OF SCIENCE EDUCATION	1	351	Time for action: science education for an alternative future	Hodson, D	2003	17,55
POLITICAL PSYCHOLOGY	2	274	Climate-Science Communication and the Measurement Problem	Kahan, Dan M.	2015	34,25
INTERNATIONAL STATISTICAL REVIEW	3	264	Adults' statistical literacy: Meanings, components, responsibilities	Gal, I	2002	12,57
ROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	4	216	Science audiences, misinformation, and fake news	Scheufele, DA and Krause, NM	2019	54
SCIENCE EDUCATION	5	193	Scientific literacy: New minds for a changing world	Hurd, PD	1998	7,72
AMERICAN BEHAVIORAL SCIENTIST	6	140	Spreadable Spectacle in Digital Culture: Civic Expression, Fake News, and the Role of Media Literacies in "Post-Fact" Society	Mihailidis, Paul; Viotty, Samantha	2017	23,33
OCEAN & COASTAL MANAGEMENT	7	135	Public ocean literacy in the United States	Steel, BS; Smith, C; Opsommer, L; et al.	2005	7,5
EUROPEAN JOURNAL OF COMMUNICATION	8	134	A nuanced understanding of Internet use and non-use among the elderly	van Deursen, Alexander J. A. M.; Helsper, Ellen J.	2015	16,75
LIBRARY & INFORMATION SCIENCE RESEARCH	9	130	How high-school students find and evaluate scientific information: A basis for information literacy skills development	Julien, Heidi; Barker, Susan	2009	10
INFORMATION SYSTEMS JOURNAL	10	122	The challenges of redressing the digital divide: a tale of two US cities	Kvasny, L; Keil, M	2006	7,17

Source: Web of Science

Table 7
The most influential journals (with more than 4 publications) in the field of Media Literacy- citizen perspective.

RANK	NAME	H-INDEX	TC	TP	TC/TP	>25	>10	>5	IF (2018)	5-IF
1	COMUNICAR	9	336	18	18,67	4	8	12	6.013	5.44
2	AMERICAN BEHAVIORAL SCIENTIST	4	237	5	47,4	2	3	4	2.558	3.686
3	EDMETIC	2	10	5	2	0	0	0	1.52	2.326
4	INFORMATION COMMUNICATION SOCIETY	5	46	5	9,2	0	2	5	5.422	7.13
5	LEARNING MEDIA AND TECHNOLOGY	2	131	5	26,2	1	2	2	4.682	4.621
6	MEDIA EDUCATION-MEDIAOBRAZOVANIE	1	8	5	1,6	0	0	1	-	-
7	PIXEL-BIT- REVISTA DE MEDIOS Y EDUCACION	2	21	5	4,2	0	1	2	-	-
8	REVISTA LATINA DE COMUNICACION SOCIAL	2	17	5	3,4	0	1	1	-	-

Source: Web of Science

Comparative results

These results constitute a strong base for further studies on Media and Information Literacy. The general picture provided by both tables shows the most influential articles in the subject, and for this reason Tables 5 and 6 are constructed. The articles with the most citations are classified in a rank, also calculating the citations per year to create an indicator that allows us to compare the influence of the selected articles nevertheless of the years it has been published.

The most cited article in the Table 5 is 'Science audiences, misinformation, and fake news' published by Scheufele, DA. and Krause, NM. in the Journal PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA. The second most cited article is 'Spreadable Spectacle in Digital Culture: Civic Expression, Fake News, and the Role of Media Literacies in "Post-Fact" Society' published by Mihailidis, Paul; Viotty, Samantha in the Journal AMERICAN BEHAVIORAL SCIENTIST. Additionally, In the Table 6, the most cited article is 'Time for action: science education for an alternative future' published by Hodson, D. in the Journal INTERNATIONAL JOURNAL OF SCIENCE EDUCATION. The second most cited article is 'Climate-Science Communication and the Measurement Problem' published by Kahan, Dan M. in the Journal POLITICAL PSYCHOLOGY.

In both cases, the most cited papers are after the year 2000, which shows recent interest in this subject. The paper with the most citations per year is Rank 1 'Science audiences, misinformation, and fake news' for Media Literacy studies and in Rank 2 'Climate-Science Communication and the Measurement Problem' for Information Literacy Studies. The conclusion than can be extracted for this analysis is that the papers published from the point of view of Media Literacy are more related with Social Sciences and the studies are more oriented to create literacy skills for citizens to better handle the online information.

Journals publishing media and literacy articles

Media literacy-citizen
   Table 7

Information literacy-citizen
   Table 8

Comparative results

Tables 7 and 8 has been creating for analyzing the Journals in which the topic has been published, considering the publication and citation count. Only the Journals with 5 or more publications in the fields are taking into consideration, attending to relative relevance criteria (Merigó et al. 2016).

'COMUNICAR' Journal has been the most productive journal in the two areas until 2022. Table 7 shows 8 Journals that represents 806 citations, and Table 8 shows 11 Journals that represents 1481 citations, representing Table 7 the 35,24% of the citations and the Table 8 the 64,75% of the citations. The last two columns show the Impact Factor of each Journal, and as a more complete indicator the Impact Factor of five years is analyzed.

There are four additional columns that show how many articles in each journal have had more than 25, 10 and 5 citations. The conclusion extracted is that the results are very low for the youth of the subject, but there are important journals that are increasing its interest in the field. Furthermore, it is interesting to mention that there are some journals that have publication in 'Media Literacy' but not in 'Information Literacy'; a possible hypothesis is that the Journals related with the study of the behavior are more used to publish studies related with the Media Literacy, and the Journals related with education field are more used to publish studies related with the Information Literacy.

Authors' affiliations and number of citations received

Media literacy-citizen
   Table 9

Information literacy-citizen
   Table 10

Table 8
The most influential journals (with more than 4 publications) in the field of Information Literacy- citizen perspective.

RANK	NAME	H-INDEX	TC	TP	TC/TP	>25	>10	>5	IF (2018)	5-IF
1	COMUNICAR	6	223	9	25,56	2	4	6	6.013	5.44
2	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	3	97	9	10,78	1	1	1	3.39	3.789
3	JOURNAL OF MEDICAL INTERNET RESEARCH	7	248	9	27,56	2	4	8	5.428	7.255
4	SUSTAINABILITY	2	14	8	1,75	0	0	2	3.251	3.473
5	INFORMATION COMMUNICATION & SOCIETY	5	75	6	12,5	1	3	5	5.422	7.13
6	PROFESIONAL DE LA INFORMACION	3	24	6	4	0	0	2	2.253	2.285
7	BMC PUBLIC HEALTH	4	179	5	35,8	3	3	4	3.295	4.003
8	INTERNATIONAL JOURNAL OF SCIENCE EDUCATION	5	456	5	91,2	2	4	5	2.241	2.656
9	JOURNAL OF LIBRARIANSHIP AND INFORMATION SCIENCE	1	3	5	0,6	0	0	0	1.992	2.009
10	JOURNAL OF RESEARCH IN SCIENCE TEACHING	5	159	5	31,8	2	4	5	4.832	5.905
11	REVISTA IBERO-AMERICANA DE CIENCIA DA INFORMACAO	1	3	5	0,6	0	0	0	-	-

Source: Web of Science

Table 9
The most productive and influential Institutions (with more than 5 publications) in the field of Media Literacy- citizen perspective.

RANK	INSTITUTION	COUNTRY	TP	TC	TC/TP	H-INDEX	> 50	> 20	> 10
1	UNIVERSIDAD DE HUELVA	SPAIN	15	185	12,33	7	0	3	6
2	UNIVERSIDAD DE CANTABRIA	SPAIN	10	164	16,4	5	1	2	3
3	UNIVERSIDAD DE VALLADOLID	SPAIN	8	52	6,5	4	0	1	2
4	UNIVERSIDAD REY JUAN CARLOS	SPAIN	8	26	3,25	3	0	0	1
5	LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES LERU	UE	7	60	8,57	2	0	1	2
6	AUTONOMOUS UNIVERSITY OF BARCELONA	SPAIN	6	25	4,17	3	0	0	1
7	UNIVERSIDAD INTERNACIONAL DE LA RIOJA UNIR	SPAIN	6	71	11,83	4	0	1	3
8	UNIVERSITY OF GRANADA	SPAIN	6	19	3,17	2	0	0	1

Source: Web of Science.

Table 10
The most productive and influential Institutions (with more than 5 publications) in the field of Information Literacy- citizen perspective

	INSTITUTION	COUNTRY	TP	TC	TC/TP	H-INDEX	> 50	> 20	> 10
1	LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES LERU	UE	18	131	7,28	7	0	1	6
2	UNIVERSIDAD DE HUELVA	SPAIN	12	135	11,25	6	0	1	4
3	UNIVERSITY OF TORONTO	CANADA	7	353	50,43	1	1	1	1
4	UNIVERSIDAD INTERNACIONAL DE LA RIOJA UNIR	SPAIN	6	71	11,83	4	0	1	3
5	UNIVERSIDAD REY JUAN CARLOS	SPAIN	6	30	5	4	0	0	1
6	UNIVERSITY OF LONDON	UK	6	281	46,83	5	2	4	4

Source: Web of Science.

Comparative results

Alternative interest picture is created when the state of art is studied by the Institutional point of view. This rank has the limitation that exist authors that are linked to different entities. Only the Institutions with 6 or more publications in the fields are taking into consideration, attending to relative relevance criteria (Merigó et al. 2016).

The results are shown in Tables 9 and 10, showing once again the youth of the subject. The two universities with the largest number of publications in Media Literacy-Citizen are Universidad de Huelva and Universidad de Cantabria, however the one in 7th rank position (Universidad Internacional de la Rioja UNIR) has a high ratio TC/TP. Regarding the Table 10, the two universities with the largest number of publications are League Of European Research Universities LERU and Universidad de Huelva, nevertheless the Institutions with higher ratio TC/TP are the University of Toronto. Perhaps the most interesting conclusion from both tables is the rising relevance of League Of European Research Universities LERU as investigation influential entity.

The conclusion that could be extracted is that the Spanish Universities are clearly stood on this issue; 10 from 14 entities analyzed in both Tables are from Spain.

Distribution of media and information literacy publications by country

Media literacy-citizen
Table 11

Information literacy-citizen
Table 12

Comparative results

The last rank that is created is the one that allows to compare the productivity and influence of each country, not corroborating the conclusion obtained in the authors and institutions analysis. Only the Institutions with 10 or more publications in the fields are taking into consideration, attending to relative relevance criteria (Merigó et al. 2016). Table 11 and Table 12 are presented with the most productive areas. These results do not match with the conclusions obtained in the Institutional analysis, because in the Institutional analysis Spain is the country with most University's publishing in the field.

From the point of view of productivity (TC/TP) is USA for Information Literacy and USA for Media Literacy.

To compare productivity and influence per inhabitant, the relative measures of the number of publication and citations depending on the population of the country have been obtained. In both cases, Spain stands out except from TC/POP in Literacy where Australia stands out.

It is clearly observed that USA and SPAIN are the countries with the highest productivity (the largest number of papers published), but USA is the one with the greater influence (the largest number of citations).

Table 11
The most productive and influential countries (with more than 9 publications) in the field of Media Literacy- citizen perspective

RANK	COUNTRY	TP	TC	TC/TP	H-INDEX	POPULATION	TP/POP	TC/POP	> 100	> 50	> 20
1	SPAIN	90	698	7,76	13	46.572,03	0,0019	0,0150	0	1	9
2	USA	74	1664	22,49	19	325.719,18	0,0002	0,0051	7	10	19
3	AUSTRALIA	21	248	11,81	9	24.598,93	0,0009	0,0101	0	1	5
4	UK	19	371	19,53	12	66.022,27	0,0003	0,0056	0	1	7
5	PEOPLES R CHINA	18	65	3,61	4	1.386.395,00	0,0000	0,0000	0	0	1
6	CANADA	17	346	20,35	7	36.708,08	0,0005	0,0094	2	2	4
7	RUSSIA	15	19	1,27	2	144.495,04	0,0001	0,0001	0	0	0
8	INDIA	10	148	14,8	4	1.393.409,03	0,0000	0,0001	1	1	1
9	SWEDEN	10	92	9,2	6	10.350,00	0,0010	0,0089	0	0	0

Abbreviations from Tables 1 and 3, except for Pop = Population (thousands); TP/Pop = Studies per millions of Populations; TC/Pop = Citations per millions of Populations
Source: Web of Science

Table 12
The most productive and influential countries in the field (with more than 9 publications) of Information Literacy- citizen perspective

RANK	COUNTRY	TP	TC	TC/TP	H-INDEX	POPULATION	TP/POP	TC/POP	> 100	> 50	> 20
1	USA	105	2661	25,34	23	325.719,18	0,0003	0,0082	9	17	26
2	SPAIN	88	753	8,56	13	46.572,03	0,0019	0,0162	1	2	7
3	UK	36	561	15,58	13	66.022,27	0,0005	0,0085	1	2	8
4	CANADA	35	817	23,34	12	36.708,08	0,0010	0,0223	3	3	5
5	AUSTRALIA	27	430	15,93	11	24.598,93	0,0011	0,0175	0	1	8
6	PEOPLES R CHINA	23	169	7,35	6	1.386.395,00	0,0000	0,0001	0	1	2
7	GERMANY	19	232	12,21	6	82.695,00	0,0002	0,0028	0	2	4
8	ITALY	19	211	11,11	5	59.550,00	0,0003	0,0035	1	1	2
9	RUSSIA	19	19	1	3	144.495,04	0,0001	0,0001	0	0	0
10	BRAZIL	15	17	1,13	2	211.715,97	0,0001	0,0001	0	0	0
11	NETHERLANDS	14	344	24,57	8	17.440,00	0,0008	0,0197	1	2	5
12	INDIA	13	188	14,46	5	1.393.409,03	0,0000	0,0001	1	1	2
13	SWEDEN	13	123	9,46	7	10.350,00	0,0013	0,0119	0	0	1

Source: Web of Science

Discussion and conclusions

A general conclusion of the results obtained is that the interest in the Information Literacy as a variable for citizen participation is higher than in the Media Literacy. It is seeming than the researchers are studying more how to engage citizens in a broader way, using the benefits that offers the Information Society than the possibilities of using the traditional political stakeholder in this process: The Media's platforms.

Nevertheless, this conclusion can be different analyzed from the point of view of the specific topic of the most cited papers because the conclusion than can be extracted for this specific analysis is that the papers published from the point of view of Media Literacy are more related with Social Sciences being these studies more oriented to create literacy skills for citizens to better handle the online information.

Although the introduction of the "entrepreneurship" criterion has not brought about differences in the results, it is important to note that information management is key in decision-making in the business field, and more so in the field of entrepreneurship. where the marketing and customer relationship management plan is critical for the survival of the company, so it is induced that these results and conclusions are valid and valuable in said entrepreneurial field.

Based on the Bibliometric analysis, four research question for further investigations could be raised for future research:

- Which variables have influenced in the researcher's interest for increasing its research's forces in Media and Information Literacy since 2008?
- What is more effective for avoiding the assumption of misinformation and disinformation: Educating citizens for moving through online information or through information provided by the media?
- Which is the main role of the Media in the Information Society?
- In Entrepreneurship area, where business decision making is so critical, what factors related to these two literacies can reveal strengths and weaknesses in their management?

In any case, this study shows which are the most relevant research focuses in terms of number of publications (and therefore more productive) and in terms of more citations (more influential therefore), while highlighting which have been the most cited and influential to date. The value of this study is to serve as a basis for further studies, having identified where the knowledge is and therefore the place to go for information to continue learning about this subject.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Aufderheide, P., & Firestone, C. M. (1993). Media literacy: a report of the national leadership conference on media literacy. Cambridge, England: Polity Press.

Ashley, S., Maksl, A., & Craft, S. (2013). Developing a news media literacy scale. *Journalism & Mass Communication Educator, 68*, 7–21.

Banaji, S., & Buckingham, D. (2013). *The civic web: Young people, the internet, and civic participation*. Cambridge, MA: MIT Press.

Bawden, D. (2008). Origins and concepts of digital literacy. In LankshearC. , & KnobeM. (Eds.), *Digital literacies: Concepts, policies and practices (pp. 17e32)*. New York, NY: Peter Lang.

Brey, A., Campàs, J., & Mayos, G. (2009). *La sociedad de la ignorancia y otros ensayos*. Barcelona: Infonomia.

Boyd, d. (2014). *It's complicated: The social lives of networked teens*. New Haven, CT: Yale University Press.

Buckingham, D. (2003). *Media education: Literacy, learning and contemporary culture*. Hoboken, NJ: John Wiley.

Choi, Y. B. (1993). *Paradigms and conventions: Uncertainty, decision making, and entrepreneurship*. University of Michigan Press.

Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory & Research in Social Education, 44*(4), 565–607.

Cortina, A. (2010). *Ética sin moral*. Madrid: Tecnos.

Cortina, A. (2004). Ciudadanía activa en una sociedad mediática.

Durieux, V., & Gevenois, P. A. (2010). Bibliometric indicators: Quality measurements of scientific publication. *Radiology, 255*(2), 342–351.

Ferguson, B. (2005), Information literacy: A primer for teachers, librarians, and other informed people, A Free Book, available at: http://bibliotech.us/pdfs/InfoLit.pdf (accessed 7 December 2015).

Gil-Gomez, H., Oltra-Badenes, R., Guerola-Navarro, V., & Zegarra Saldaña, P. (2021). Crowdfunding: a bibliometric analysis. *International Entrepreneurship and Management Journal, DOI*. http://doi.org/10.1007/s11365-021-00784-0.

Gozálvez-Pérez, V., & Contreras-Pulido, P. (2014). Empowering media citizenship through educommunication. *Comunicar, 21*(42), 129–136.

Greppi, A. (2012). *La democracia y su contrario. Representación, separación de poderes y opinión pública*. Madrid: Trotta.

Guerola-Navarro, V., Oltra-Badenes, R. F., Gil-Gomez, H., & Gil-Gomez, J. A. (2020). Customer Relationship Management (CRM): A Bibliometric Analysis. *International Journal of Services Operations and Informatics, 10*(3), 242–268. doi:10.1504/IJSOI.2020.108988.

Guerola-Navarro, V., Gil-Gomez, H., Oltra-Badenes, R., & Sendra-García, J. (2021). Customer relationship management and its impact on Innovation: A literature review. *Journal of Business Research, 129*, 83–87. doi:10.1016/j.jbusres.2021.02.050.

Hobbs, R., Donnelly, K., Friesem, J., & Moen, M. (2013). Learning to engage: How positive attitudes about the news, media literacy, and video production contribute to adolescent civic engagement. *Educational Media International, 50*, 231–246.

Jenkins, H., Ford, S., & Green, J. (2013). *Spreadable media: Creating value and meaning in a networked culture*. New York: New York University Press.

Kahne, J., & Bowyer, B. (2016). Educating for democracy in a partisan age: Confronting the challenges of motivated reasoning and misinformation. *American Educational Research Journal, 54*, 3–34. doi:10.3102/0002831216679817.

Kellner, D. (2003). Engaging media spectacle. *M/C: A Journal of Media and Culture, 6*(3). Retrieved from http://journal.media-culture.org.au/0306/09-mediaspectacle.php.

V. Guerola-Navarro, D. Stratu-Strelet, D. Botella-Carrubi et al.

Sustainable Technology and Entrepreneurship 2 (2023) 100030

Kolle, S. R. (2017). *Global research on information literacy: A bibliometric analysis from 2005 to 2014*. The Electronic Library.

Koos, J. A. (2019). Bibliometric analysis provides a detailed map of information literacy literature in the social sciences and humanities. *Evidence Based Library and Information Practice, 14*(4), 177–178.

Lee, T., Lee, B. K., & Lee-Geiller, S. (2020). The effects of information literacy on trust in government websites: Evidence from an online experiment. *International Journal of Information Management, 52*, 102098.

Maharana, R. K. (2013). Bibliometric analysis of Orissa University of Agricultural Technology's research output as indexed in Scopus in 2008-2012. *Chinese Librarianship: An International Electronic Journal, 36*. available at www.iclc.us/cliej/cl36maharana.pdf (accessed 7 December 2015).

Makinen, M. (2006). Digital empowerment as a process for enhancing citizens' participation. *E-learning, 3*, 381–395. doi:10.2304/elea.2006.3.3.381.

Merigó, J. M., Rocafort, A., & Aznar-Alarcón, J. P. (2016). A bibliometric overview of business and research area. *Journal of Business Economics and Management, 17*(3), 397–413.

Mihailidis, P., & Viotty, S. (2017). Spreadable spectacle in digital culture: Civic expression, fake news, and the role of media literacies in "post-fact" society. *American Behavioral Scientist, 61*(4), 441–454.

Mulla, K. R. (2014). Information literacy for students and teachers in Indian context. *Pearl-A Journal of Library and Information Science, 8*(2), 88–96.

Moeller, S., Joseph, A., Lau, J., & Carbo, T. (2011). *Towards media and information literacy indicators.* Paris, France: United Nations Educational, Scientific and Cultural Organization.

Mulet-Forteza, C., Mauoleón-Méndez, E., Merigó, J., & Genovart-Balaguer, J. (2019). Leading universities in tourism and hospitality research: A bibliometric overview. *Advances in Intelligent System and Computing.*

Ribble, M., & Bailey, G. (2007). *Digital Citizenship in School.* Washington DC: Interna-tio-nal Society for Teehnology in Education.

Parvathamma, N., & Pattar, D. (2013). Digital literacy among student community in management institutes in Davanagere District, Karnataka State, India. *Annals of Library and Information Studies, 60*, 159–166.

Pinto, M., Fernández-Pascual, R., Caballero-Mariscal, D., Sales, D., Guerrero, D., & Uribe, A. (2019). Scientific production on mobile information literacy in higher education: a bibliometric analysis (2006−2017). *Scientometrics, 120*(1), 57–85.

Potter, W. J. (2010). The state of media literacy. *Journal of Broadcasting & Electronic Media, 54*, 675–696.

Saputra, M., & Al Siddiq, I. H. (2020). Social media and digital citizenship: The urgency of digital literacy in the middle of a disrupted society era. *International Journal of Emerging Technologies in Learning (iJET), 15*(07), 156–161.

Scheufele, D. A., & Krause, N. M. (2019). Science audiences, misinformation, and fake news. *Proceedings of the National Academy of Sciences, 116*(16), 7662–7669.

Shepherd, D. A., Williams, T. A., & Patzelt, H. (2015). Thinking about entrepreneurial decision making: Review and research agenda. *Journal of management, 41*(1), 11–46.

Silverman, C. (2015). Lies, damn lies, and viral content: How news websites spread (and debunk) online rumors, unverified claims, and misinformation. Retrieved from http://tow-center.org/wp-content/uploads/2015/02/LiesDamnLies_Silverman_TowCenter.pdf

Singh, G., Mittal, R., & Ahmad, M. (2007). A bibliometric study of literature on digital libraries. *The Electronic Library, 25*(3), 342–348.

Shiau, W. E. (2015). Supply chain management: exploring the intellectual structure. *Sciencentometrics*, 215–230.

Shoeb, Z. H. (2011). Information literacy competency of freshman business students of a private university in Bangladesh. *Library Review, 60*(9), 762–772.

Tewell, E. (2015). A decade of critical information literacy: A review of the literature. *Communications in Information Literacy, 9*(1), 2.

UNESCO (2007). Agenda de París. (www.diplomatie.gouv.fr) (26-05-2013).

Ubogu, J. O. (2011). Information literacy among medical students in the College of Health Sciences in Niger Delta. *Program: Electronic Library and Information Systems, 45*(1), 107–120.

Vicedo, P., Gil-Gomez, H., Oltra-Badenes, R., & Guerola-Navarro, V. (2020). A bibliometric overview of how critical success factors influence on enterprise resource planning implementations. *Journal of Intelligent & Fuzzy Systems, 38*(5), 5475–5487. doi:10.3233/JIFS-179639.

Wang, L. (2011). An information literacy integration model and its application in higher education. *Reference Services Review, 39*(4), 703–720.

Zhu, Q., & Willett, P. (2011). Bibliometric analysis of Chinese superconductivity research, 1986- 2007. *ASLIB Proceedings, 63*(1), 101–119.

Zurkowski, P.G. (1974), "The information service environment relationships and priorities", Related Paper No. 5, available at: https://eric.ed.gov/?idED100391 (accessed 26 January 2016).