

Information Literacy needs Open Access or: Open Access is not only for researchers

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Abstract. The Open Access was initially (blandly) conceived in view not only of researchers but also of lay readers, then this perspective slowly faded out. The Information Literacy movement wants to teach citizens how to arrive at trustable information but the amount of paywalled knowledge is still big. So, their lines of development are somehow complementary: Information Literacy needs Open Access for the citizens to freely access high quality information while Open Access truly fulfils its scope when it is conceived and realized not only for the researchers (an aristocratic view which was the initial one) but for the whole society.

Keywords: information literacy, open access, citizenship, information society, predatory journals

1 Open Access and the researchers, and a forgotten promise

Today Open Access is usually meant as a matter for researchers because it is said to refer to the free access of peers to scientific literature. But an historical overview through relevant documents which are at the base of the Open Access movement shows a continual co-existence of both the researchers and the society, as the main beneficiaries of the new paradigm. An archaeology of Open Access writings could possibly start with Guédon ending words of his essay "In Oldenburg's long shadow": "Librarians can (and ought to) help create a navigable, worldwide ocean of knowledge, open to all; ... a distributed intelligence civilization – a civilization open to all that are good enough (excellence), and not only to those who can afford it (elites)."[1]. An *ocean of knowledge* is what we today know as the domain of Open Access publications, but *open to all* is ambiguous: we probably mean "all" in a widely inclusive sense, while Guédon explains it in an aristocratic sense, "all who excel hence deserve it" as a reaction to the traditional, consolidated (oligarchic!) sense of "all who have the power to obtain it". What clearly appears is that the concept of future Open Access starts as a matter internal to the world of research. This was in 2001.

Subsequently in 2008 Guédon in his "Open Access and the divide between "mainstream" and "peripheral" science" never mentions the society, only one time the school

and the citizens: "Likewise, the school system, at least the secondary level, could benefit from free access to the research literature, particularly in the social sciences and the humanities. Citizens would also have a chance of being better informed." [2]. Similarly goes in the 2016 paper of Guédon and Jensen, "Crystals of Knowledge Production" [3] which is a discussion about Open Science and humanities: the word *research* recurs 34 times, the word *society* 1 time ("open access gives value for researchers and their institutions, for companies, and for society as a whole"), the word *citizens* 0 times.

Suber in 2003 in his overview of Open Access [4] has one phrase about the relation between Open Access and citizens: "Citizens: OA gives them access to peer-reviewed research (most of which is unavailable in public libraries) and gives them access to the research for which they have already paid through their taxes. It also helps them indirectly by helping the researchers, physicians, manufacturers, technologists, and others who make use of cutting-edge research for their benefit". Apart from the description of what is Open Access and its reasons, the passage essentially says: "Open Access helps citizens because it really helps researchers working for their benefit". The citizens are not active, involved in the personal acquisition of new knowledge, rather they are passive receivers of what others do for them. More interesting is what Suber writes in 2012 in his "Open Access" book: "OA allows us to provide access to everyone who cares to have access, without patronizing guesswork about who really wants it, who really deserves it, and who would really benefit from it. ... The idea is to stop thinking of knowledge as a commodity to meter out to deserving customers, and to start thinking of it as a public good, especially when it is given away by its authors, funded with public money, or both" [5] which is probably one of the most thorough statements one can find about the strong interconnection between Open Access and citizens. He also introduces the concept of "lay reader", the non-professional reader who has nevertheless a personal interest in the scientific knowledge (this is similar but not identical to thinking in terms of society and citizens).

This overview can end with documents and declarations by institutions and public bodies. The Budapest Open Access Initiative document [6] in 2002 describes the Open Access speaking of "world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds" and of "free availability [of scientific literature] on the public internet, permitting any users to read ... the full texts of these articles". The world of scientists and scholars is well present but it is complemented by "other curious minds" and by the fact that the promise of free reading is for "any users". The subscribers of the Berlin Declaration [7] say in 2003 "our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society" and the word "society" is clear and explicit. And the preamble of the Italian "Dichiarazione di Messina" signed in 2004 mentions both the "importanza fondamentale che la diffusione universale delle conoscenze scientifiche riveste nella crescita economica e culturale della società" and the "esigenza avvertita in seno alle comunità accademiche internazionali e negli Atenei italiani di individuare forme alternative di diffusione della comunicazione scientifica che garantiscano la più ampia disseminazione e il più alto impatto scientifico dei prodotti culturali creati al loro interno". The presence of the "crescita economica e culturale della società" in the first statement

is balanced by the presence of "il più alto impatto scientifico dei prodotti culturali creati al loro interno" where the scientific impact is a matter internal to the scientific/academic world.

One of the most recent assertions of the access for the citizens as a component of Open Access is present (and bounding) in the Horizon 2020 programme Manual: "Why Have Open Access To Publications And Data In Horizon 2020? [...]"

Broader access to scientific publications and data helps to

- build on previous research results (improved quality of results)
- encourage collaboration and avoid duplication of effort (greater efficiency)
- speed up innovation (faster progress to market means faster growth)
- involve citizens and society (improved transparency of the scientific process)."[8]

Here we see the presence of society and citizens - but properly speaking they are mentioned as *controllers* who thanks to the transparency of the process may keep an eye over its development and management and not as *learners* as it was in other texts among those we mentioned above.

If we come to the current scientific debate about Open Access, some recurrent sub-topics appear – among which the relation between Open Access and society is not of primary relevance. Apparently, the biggest subtopic – hence the biggest discussion issue – is the relation between Open Access and impact factor: 'does publishing in Open Access produce better impact score than publishing in toll access?'. Piwowar et al. [9] declare in 2018 "our results show that the percentage of the literature available as OA is growing, and that articles diffused through this form are generally more cited than closed access articles". And seven years ago it was the same, suffice to cite the work of Lewis [10] who among many publications of the previous years about this question mentions a supporting metanalysis by A. Swan [11]. Another relevant subtopic is: 'which are the implications of Open Access publishing face to the evaluation of research?' and we can see for example Turbanti [12], Michetti et al. [13] The latter states "sia le norme dettate dall'ANVUR (Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca) circa la valutazione della qualità della ricerca scientifica, sia le regole definite dalle procedure di Abilitazione Scientifica Nazionale spesso spingono gli autori verso la scelta di sedi editoriali che pubblicano in modalità classica". Other issues are the relation between Open Access and Open Data [14], the feasibility of various economic approaches to Open Access [15], and so on.

The relation of Open Access with society and the citizens is only marginally present in the current scientific debate about Open Access and this somehow configures a forgotten promise. The data speak for themselves: in Google Scholar the search for "open access" *citizens* gives around 461.000 matches; the search for "open access" *research* gives around 4.230.000 matches – the ratio is 1:9. If we focus on the year 2018, the results are respectively around 15.800 and around 47.000 with a ratio of around 1:3¹ what shows that recently the *citizens* occupy a growing space in debate about Open Access, even if still smaller than the one occupied by the *research*.

¹ At the date of 15 November 2018.

2 Information literacy: what is it? some definitions

A domain near to Open Access where there is great attention to the access to information is that of Information Literacy. Information Literacy was conceived in the times of print, in 1974, when P. Zurkowski wrote an internal report for the National Commission on Libraries and Information Science, Washington, DC. The title was quite bureaucratic: "The Information Service Environment Relationships and Priorities. Related Paper No. 5" [16] but already in the abstract the focus was pragmatic and evident: "the top priority of the National Commission on Libraries and Information Science should be directed toward establishing a major national program to achieve universal information literacy by 1984". So, a first relevant point is that Information Literacy is not in itself a product or an expression of the digital world. The key passages of Zurkowski reasoning, in views of the argument we are developing, are these:

"We experience an overabundance of information whenever available information exceeds our capacity to evaluate it. ... The infrastructure supporting our information service environment transcends traditional libraries, publishers and schools. It embraces the totality of explicit physical means, formal and informal, for communicating concepts and ideas. ... People trained in the application of information resources to their work can be called information literate. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources. The individuals in the remaining portion of the population, while literate in the sense that they can read and write, do not have a measure for the value of the information, do not have an ability to mold information to their needs, and realistically must be considered to be information illiterates ... The effort must be done to give *to all the information illiterates* the same capabilities of the one sixth of already literate US population ... [the national program of information literacy] would involve the coordination of funding of a massive effort to train all citizens in the use of information tools now available as well as those in the development on testing states. The pattern of growth in this field is well established and should be built upon to expand the overall capability of all of US. Citizens".

In the last decade particularly in the Anglo-American world many definitions of Information Literacy considering the digital world and Internet were developed, by Jisc, CILIP, SCONUL, ACRL, NHS Education Scotland, all variously based onto "the 5 competencies":

- define a specific need for information
- find the appropriate sources
- do the search
- evaluate the results
- use the results

These definitions evolved in recent times when the world faced the phenomena of fake news diffusion in digital social environments. The most striking one in this new perspective is that of CILIP, the professional association of UK librarians: "Information

literacy is the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society" [17] because it abandons the previous descriptive/operative approach and simply affirms a need: "ability to think critically". CILIP definition explicitly states that (valuable, correct) information is needed by citizens engaging with the society but it contains a problematic aspect as Testoni recently wrote: "[CILIP definition] rischia di sussumere il nucleo concettuale dell'Information literacy in quello, troppo ampio e vago, di "pensiero critico""[18].

On the same subject of what is Information Literacy there is abundant literature from Unesco and European institutions. From Unesco we can mention the report by F. W. Horton, "Overview of information literacy resources worldwide"[19], who in 2008 has also been the author of the big manual "Understanding Information Literacy: A Primer" [20]. On the Europe side, the European Council in the "Council conclusions of 30 May 2016 on developing media literacy and critical thinking through education and training"[21] focuses on the invitation to the member States "to encourage sufficient attention to be paid to developing media literacy and critical thinking in education and training at all levels, including through citizenship and media education" and the report of the European Commission on "Promoting media and information literacy in libraries"[22] discusses if "media and information literacy programmes in public libraries can be called effective in general".

2.1 Information literacy according to the *Manifesto per l'Information Literacy of AIB*

AIB, the Italian associations of librarians recently published its *Manifesto per l'Information Literacy* [23]. Information Literacy is there described in reference to two external definitions: the UNESCO/IFLA Media Information Literacy definition

"Media and Information Literacy consists of the knowledge, the attitudes, and the sum of the skills needed to know when and what information is needed; where and how to obtain that information; how to evaluate it critically and organise it once it is found; and how to use it in an ethical way. The concept extends beyond communication and information technologies to encompass learning, critical thinking, and interpretative skills across and beyond professional and educational boundaries"[24]

and the AGID² Information literacy definition

"l'insieme di abilità, competenze, conoscenze e attitudini che portano il singolo a maturare nel tempo, durante tutto l'arco della vita, un rapporto complesso e diversificato con le fonti informative: i documenti e le informazioni in essi contenuti. ... In sintesi la competenza informativa prevede la capacità di riconoscere un bisogno informativo, ricercare, valutare, utilizzare le informazioni in modo consapevole per creare nuova conoscenza."[25]

² AGID is the Italian State agency "Agenzia per l'Italia Digitale".

while at the same time declaring the need for "una definizione operativa e agile di IL, complementare a quelle prodotte da IFLA e AGID, che rifletta le peculiarità dello scenario italiano e europeo". So, at definitions level things are a little blurred. But on the relation of Information Literacy with citizenship in the Information Society the statements are unambiguous: "l'Information Literacy è un diritto di base per i cittadini"³; "l'Information Literacy fa parte di una costellazione più ampia che include competenze necessarie per esercitare i propri diritti civili politici economici sociali e culturali; acquisire e applicare nuove competenze, arricchire la propria identità ed espressione culturale, partecipare al processo decisionale ed alla vita di una società civile attiva e impegnata"⁴.

The most relevant concepts of the Manifesto are the awareness that people are not only consumers of information (hence the need to draw a road which should bring to sound and trustable information) but also producers of information in the social media world, and the intersection of printed sources in the physical world with digital sources. Accordingly, the Manifesto gives methodological indications to help people to avoid the pitfalls. In fact in the Manifesto is present a disguised sequence of steps for moving from more general to more specific information resources. We say disguised because the Manifesto contains in its second half 17 themes/focuses which are, it is explicitly said, "listed in casual, not structured order". But they really are related to one another and the relations, when brought to evidence, change the random list into a rich set of conceptual nets. One of these "conceptual nets" is precisely the one describing a methodological approach to the research of information inside the available, different types of resources. The steps mentioned in the Manifesto are:

“utilizzare i motori di ricerca

utilizzare Wikipedia

utilizzare le fonti aperte

utilizzare fonti specialistiche

conoscere le fonti informative appropriate per la propria area disciplinare". [23]

They contain a mismatch between "fonti aperte [open access sources]" and "fonti specialistiche [specialized sources]" as if the open access sources couldn't be specialized or vice-versa. Another problematic aspect of these definitions is that what are called open access *sources* are Google Books, Internet Archive, Gutenberg Project, Treccani Encyclopedia, Europeana, Internet Culturale, which *in a context where the ultimate scope are specific documents containing the requested information* can hardly be called sources given that also the found, relevant documents are sources. It is more appropriate

³ The reference is to the statement "Information Literacy ...is a basic human right in a digital world and promotes social inclusion of all nations" which is part of the IFLA Alexandria Proclamation on Information Literacy and Lifelong Learning of 2005, <https://www.ifla.org/publications/beacons-of-the-information-society-the-alexandria-proclamation-on-information-literacy>

⁴ The reference is to "exercise their civil, political, economic, social and cultural rights; be economically active, productive and innovative; learn and apply new skills; enrich cultural identity and expression; take part in decision-making and participate in an active and engaged civil society", in the Lyon Declaration on Access to Information and Development of 2014, <https://www.lyondeclaration.org/>

to call "resources" these collections of documents and to leave the name of "sources" to the documents they give access to.

So, the steps of the research for information could be more properly redefined in this general form:

1. using generalist search engines - Google search, Google Books, etc.
2. using encyclopedias – Wikipedia, Treccani, ...
3. using multidisciplinary resources / specialized search engines - Google Scholar, Scopus, WoS, DoAJ, etc.
4. using specialized resources, like publishers' websites, SIGs, databases, etc.
5. using resources specifically focused onto the disciplinary domain of interest, like scientific journals.

The first two steps are probably more relevant if the interested person is completely new of the field she wants to investigate and therefore needs to build her own vocabulary of things and concepts. Fact is that in the subsequent three steps (using specialized search engines, using specialized resources, using resources specifically focused onto the disciplinary domain of interest) it is more than probable that the reader (lay or professional) comes across toll access resources, mainly but not only scientific journals. If the intention of giving to all of the citizen the ability to access relevant, trustable information on every field is at the core of Information Literacy, *then this intention crashes against the paywall of scientific journals.*

3 Citizens need free access to scientific knowledge

On one side, that all citizens must have full access to the whole corpus of scientific knowledge is a concept bridging Information Literacy and Open Access, without forcing the meaning of both movements: Information Literacy needs a content explaining/showing the usefulness of the literacy itself and Open Access needs a broad scope not simply a focused one. On the other side, one basic argument against Open Access is precisely that full knowledge open to all is not really needed or, one could rephrase, society doesn't need it. Things are more complex, though. Open Access needs a broad scope because if it is meant only for researchers – which is the dominant trend of today – some mechanism internal to the research domain surely can be found to give all the researchers the access to scientific literature; but that would mean that Open is open only to those who deserve it, that knowledge is open to the knowledge workers and not to the others – somehow a coming back to the positions of Guédon in 2001[1]. The true change of paradigm happens instead when we recognize that knowledge must be practically, not only in principle, open to all, and knowledge *really becomes* open to all. There are two main aspects of it: the use of existing knowledge and the production of new knowledge.

Use of existing knowledge. Present times and the present society are usually described as an Information Society because information is abundant, flows everywhere and being out of this flow means being out of the life blood of every activity (we all know that on the management and use of information are based the biggest corporations of the

present world). So, being able to access, understand and (re)use information is obviously a major aim and issue for the citizens of this type of society. The above-mentioned new version of the Information Literacy definition published by CILIP [18], notwithstanding the doubts it can raise, precisely tries to map this situation where managing information in the widest sense is vital for every aspect of citizens' life. Simple words like "managing information in the widest sense is vital" hide one of the biggest problem of IL, that is not simply explaining/teaching how specific pieces of information must be correctly analyzed, rather teaching how to autonomously find the sources of trustable information and how to evaluate it when technical competence is needed.⁵ Or – to express the matter in other words – IL is not simply (must not be reduced to) a type of training to the use of 'intellectual devices'⁶: it is instead a literacy (!) which is learnt over the years as the already cited "Promoting media and information literacy in libraries" states: "Ultimately, information literate people are those who have learned how to learn".

Usually when speaking of what could be the interest for citizens in Open Access first of all one thinks of medical information⁷. Medical information means which therapies are really, and most, effective – and this has implications in relation to the expenses paid by the institutions running the medical system and by the citizens who pay to obtain the therapies; but this also puts in evidence which hospitals are better in caring specific illnesses. All this in turn has implications for the perspectives and expectancy of life of people and for the costs the public institutions will have to pay, or not, for the present and future health of those people - at least in the European welfare. The intersection with the theme of Open Data is also clear: clever readers of Open Data released by transparent administrations can understand in depth many aspects of the management of health which today are fairly obscured.

But the perspectives are really much wider. Let's see an example. An article studying the pros and cons of open space arrangement in offices, versus cubicles or private rooms, was recently published in the "Occupational & Environmental Medicine" journal [26]. It would be of interest for all of the workers facing a rearrangement of their workspaces to know the results of these and similar researches. "Occupational & Environmental Medicine" is an Open Access journal; but most probably the vast public who could be interested in such an article does not know that these studies exist, that some of them can be freely accessed, that they can be used to make choices with a high impact on the individual lives: *and this ignorance is a problem of Information Literacy*. FOSTER plus European project [27], for example, specifically tackles this problem with its module "Integrating Open Science in Information Literacy education" but once more its aim are the researchers, not the society or the citizens: FOSTER aim is "to contribute

⁵ For example, competence in statistics is needed when medical data are under scrutiny: how the data are collected, with which criteria, what do they describe, what do they imply. Hence for example: US medical data describing the outcome of a therapy for an illness can be directly meant to describe the outcome for EU patients?

⁶ We can think of a variety of places (physical and digital) and activities like courses, workshops, MOOCs undoubtedly useful.

⁷ Health literacy is the most frequently mentioned literacy in the titles of European institutions publications.

to a real and lasting shift in the behaviour of European researchers to ensure that Open Science (OS) becomes the norm".

On the problematic side, in various situations, people don't want to share data in open access because they think that they could in the future, in today unforeseeable ways, take profit – economic, intellectual, etc. – from the data they actually produced and feel as 'their own'⁸. But this about Open Data is a much wider discourse.

Production of new knowledge. The high complexity of today's world has us all thinking that the production of knowledge is reserved to those who (already) knows. Undoubtedly there are real reasons to think so, but this way of thinking implies an idea of knowledge as repetition, an idea of science as walled garden. The idea of trusting those who already proved trustable. And the situation of paywall around a big part of the knowledge excludes those who work and don't study *hence (apparently) have no need to intellectually progress their life*. But real (radical) innovation requires at least that also new persons can 'enter the domain' that is that they can access the knowledge body actually available. The core of the concept lays in the word "new", new persons: that is outsiders, those who are not already part of the research domain be it academic or private. Take for example a student who has finished her/his degree programmes: as soon as s/he goes out of the academia s/he loses the legal access to the paywalled scientific publications. But probably that is the moment when s/he is more intellectually productive in an innovative way. The assumption of Information Literacy in 1974 that an improved ability of all of the citizens and workers to access sources of information of assured quality and exploit them in their activities is beneficial for the whole country and its economy could be rephrased. We could say that the human capital and the cultural capital must be preserved and fostered, and this happens if people of every type – not only scientists and scholars – have continuous, abundant, free access to authoritative sources of information and knowledge.

In line with these reflections Catalani [28] commenting the conference “Sfide e alleanze tra Biblioteche e Wikipedia”, held in 2017 at the Biblioteca Nazionale Centrale di Firenze, wrote: " Progetti del genere [Wikimedia, Wikisource, Wikidata] consentono di centrare diversi obiettivi: la valorizzazione del patrimonio bibliografico, il miglioramento della qualità dell'informazione sulle piattaforme Wikimedia, il trasferimento delle conoscenze a beneficio dell'intera società civile in un'ottica di terza missione, il

⁸ Every researcher feels that the data s/he produced are their own – be it only until the data are used for a publication, what has a strict relation with the concept of intellectual property and authorship. One could think that data are not fully comparable to an original creative intellectual product because they would be a property of things which comes to evidence. Nevertheless, data are the product of a “question” asked by the researcher on the basis of her/his original creative intellectual construct describing the state of things s/he is studying, so an approach to data as intellectual property is legitimate.

coinvolgimento degli studenti nel processo di costruzione del sapere a seguito dell'acquisizione di abilità di media literacy." The presence of "trasferimento delle conoscenze a beneficio dell'intera società civile" is of primary relevance, obviously.⁹

The need for literacy. The main, obvious objection to the above paragraphs is that "it is not easy", "one needs to be an expert", "to do so a lot of education is necessary". Yes, it is true – see e.g. what Lopes et al.[29], and many others, wrote¹⁰. And here is the point where Open Access and Information Literacy connect to each other: the flow of information is complex and to intercept it, to take profit of it, the usual literacy is not sufficient. An Information Literacy is needed. In 1974 Paul Zurkowski understood this need more clearly than today when apparently the dominating idea is that using the devices corresponds to thus being informationally and digitally literate. The phenomenon of predatory journals (publication of unevaluated research articles on pay-to-publish journals) is one of the holes on the dark side of research, which shows that (more) Information Literacy is necessary also on the part of reputed scholars and scientists, as it seems if they contribute to those journals. The first organized description expression of the problem probably was the so called "Beall list" (<https://bealllist.weebly.com/>) and the last one at the moment of writing of this paper was the article published by to investigative journalists, Langhans and Krause, on the *Süddeutsche Zeitung* [30] showing that unfortunately many serious scholars publish on predatory journals. The article specifically investigated these practices in the German research context but nothing allows to think that for any other country the situation would be much different. One of the focal points of the matter was expressed by a post signed by Gerd Antes, scientific director of the Cochrane Germany Foundation, commenting the *Süddeutsche Zeitung* article and published in the Cochrane community blog [31]¹¹. He wrote that "the technical revolutions [brought by the digital world] that have taken place allow every lay individual to put together a professional-looking journal on the Internet, in which scientists from reputable institutions may then publish their findings, without even realizing what they are getting into". If it is sufficient for a journal to be "professional looking" for a scholar to judge it suitable to publish there, then a lot of education into Information Literacy is necessary also for those who could be deemed already fully literate.

⁹ Crowdsourcing scientific activities (like collaborative transcription of ancient manuscripts; tagging of historical pictures; and so on) is not relevant in this respect, as no one of the participants will write a *scientific paper* on the texts they transcribed. Someone else, a scholar, will do that, taking profit of the work of the transcribers.

¹⁰ The "terza missione" of the University, as it is called in Italy, that is "la valorizzazione e il trasferimento delle conoscenze verso il contesto socio-economico" doesn't escape the approach where the focus is on the transmission of knowledge, not on the education which allows people to individually and autonomously build knowledge.

¹¹ The Cochrane collaboration is a no-profit initiative for producing high-quality, relevant, accessible systematic reviews of scientific literature so allowing to make health decisions through high-quality information. They work mainly with scientific journals.

4 Once more, digital libraries

The most radical difference between the times of Zurkowski and ours is the digital world: while information continues to be abundant in the physical world (mainly in the form of print) its part present in the digital world is much more manageable and easily reachable but requires new perspectives, new abilities, new competence. In fact, it is today that the ideas of Zurkowski become really capable to change the reality. Antes comments instead that "this development [the spread of predatory journals] is one of the systematically overlooked, undesirable side effects of the digit[al]ization movement" as if being still at the times of Oldenburg could be better. We on the contrary think that the problems we face are those of our time - it means that there will be a lot of work for librarians to do, to bring not only to Open Access but also to Information Literacy scholars and scientists, students and citizens. And for the scientific information and knowledge the digital libraries digital continue to have a role to play.

References

1. Guédon, J.-C.: In Oldenburg's long shadow: librarians, research scientists, publishers, and the control of scientific publishing. Association of Research Libraries, Washington, D.C (2001).
2. Guédon, J.-C.: Open access: contro gli oligopoli nel sapere. Edizioni Ets, Pisa (2009).
3. Guédon, J.-C., Jensen, T.W.: Crystals of Knowledge Production. An Intercontinental Conversation about Open Science and the Humanities. *Nordic Perspectives on Open Science*. 1, 1 (2015).
4. Suber, P.: Open access overview, (2009).
5. Suber, P.: Open access. MIT Press, Cambridge, MA (2012).
6. Budapest Open Access Initiative | Read the Budapest Open Access Initiative, <https://www.budapestopenaccessinitiative.org/read>.
7. Berlin Declaration, <https://openaccess.mpg.de/Berlin-Declaration>.
8. European Commission: Open access - H2020 Online Manual, http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/open-access_en.htm.
9. Piwowar, H., Priem, J., Larivière, V., Alperin, J.P., Matthias, L., Norlander, B., Farley, A., West, J., Haustein, S.: The State of OA: A large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ*. 6, 1–23 (2018).
10. Lewis, D.W.: The inevitability of open access. *College & Research Libraries*. 73, 493–506 (2012).
11. Swan, A.: The Open Access citation advantage: Studies and results to date, <https://eprints.soton.ac.uk/268516/>.
12. Turbanti, S.: L'editoria scientifica e la valutazione/Scientific publishing and research assessment. *Il capitale culturale. Studies on the Value of Cultural Heritage*. 59–69 (2018).
13. Michetti, E., Lovascio, C., Morici, S.: L'accesso aperto alla letteratura scientifica: un'analisi multilivello/Open access to scientific literature: a multilevel analysis.

Il Capitale Culturale. Studies on the Value of Cultural Heritage. 71–93 (2018).

14. Mueller-Langer, F., Andreoli-Versbach, P.: Open access to research data: Strategic delay and the ambiguous welfare effects of mandatory data disclosure. *Information Economics and Policy*. 42, 20–34 (2018).

15. Siler, K., Haustein, S., Smith, E., Larivière, V., Alperin, J.P.: Authorial and institutional stratification in open access publishing: the case of global health research. *PeerJ*. 6, e4269 (2018).

16. Zurkowski, P.G.: The Information Service Environment Relationships and Priorities. Related Paper No. 5. (1974).

17. CILIP: CILIP Definition of Information Literacy 2018, <https://infolit.org.uk/ILdefinitionCILIP2018.pdf>, (2018).

18. Testoni, L.: Una nuova definizione di Information literacy. *Alcune riflessioni. Vedianche*. 28, 29–31 (2018).

19. Horton, F.W.: Overview of information literacy resources worldwide. UNESCO (2014).

20. Horton, F.W.: Understanding information literacy: a primer. UNESCO (2008).

21. Council conclusions of 30 May 2016 on developing media literacy and critical thinking through education and training. *Official Journal of the European Union*. 5–8 (2016).

22. Directorate-General for Internal Policies: Research for culture committee : promoting media and information literacy in libraries : in-depth analysis. European Parliament (2018).

23. AIB: Manifesto per l'Information Literacy, <http://www.aib.it/struttura/commissioni-e-gruppi/gruppo-literacy/ilmanifesto/>.

24. IFLA: IFLA Media and Information Literacy Recommendations, <https://www.ifla.org/publications/ifla-media-and-information-literacy-recommendations>.

25. Agenzia per l'Italia Digitale: Programma nazionale per la cultura, la formazione e le competenze digitali. LINEE GUIDA. Presidenza del Consiglio dei Ministri (2014).

26. Lindberg, C.M., Srinivasan, K., Gilligan, B., Razjouyan, J., Lee, H., Najafi, B., Canada, K.J., Mehl, M.R., Currim, F., Ram, S., Lunden, M.M., Heerwagen, J.H., Kampschroer, K., Sternberg, E.M.: Effects of office workstation type on physical activity and stress. *Occup Environ Med*. 75, 689–695 (2018).

27. FOSTER, <https://www.fosteropenscience.eu/>.

28. Catalani, L.: Spread open knowledge to create new one. Report of the conference “Challenges and Alliances between Libraries and Wikipedia”(Central National Library of Florence, November 10th 2017. *Bibliothecae. it*. 7, 391–404 (2018).

29. Lopes, C.A., Antunes, M. da L., Sanches, T.: Contributos da literacia da informação para a ciência aberta. La contribución de la alfabetización informacional a la ciencia abierta. 12, 59–67 (2018).

30. Langhans, K., Krause, T.: Tausende Forscher publizieren in Pseudo-Journalen, <https://www.sueddeutsche.de/wissen/wissenschaft-tausende-forscher-publizieren-in-pseudo-journalen-1.4061005>, (2018).

31. Antes, G.: Predatory Journals and Predatory Publishers – Challenges within the Publishing Sector, <https://community.cochrane.org/news/predatory-journals-and-predatory-publishers-challenges-within-publishing-sector>, (2018).