III. The pedagogy of critical thinking. Professional development of teachers for social justice and risk education

Flávia Siqueira, Agnaldo Arroio

A strategy for addressing fake news and denialism in Elementary and Secondary Schools

Introduction

Several studies point to a growing concern with the problem of fake news after 2016, driven by political communication practices related to the Brexit campaign (Grice, 2017) and the election of Donald Trump in the United States (Coll, 2017, Hughes and Waismel-Manor, 2020). In Brazil, similar problems and effects have been associated with communication practices related to the presidential campaign of 2018 and the term of Jair Bolsonaro, as reported by several news outlets around the globe (Phillips, 2018, Cowie, 2018, Barbara, 2021, Gortázar, 2022).

During the Covid-19 pandemic (2020–2022), the spread of fake news related to the disease and vaccination has shown the harmful impacts of disinformation and misinformation on policy-making, as well as on individual and collective decision--making processes. Some studies show, for example, how disinformation and misinformation are related with vaccine hesitancy, as the ones published by Galhardi et al. (2022) and Loomba et al. (2021). Such context has also highlighted the risks of "science denialism", "by which is meant an activity aimed at renouncing some well--justified assertion or theory in mainstream science" (Hansson, 2018, p. 2).

Although the problem of "fake news" and denialism is not new, it has been boosted by the convergence of factors such as the growing digitization of social life, changes in information search and consumption habits, the crisis of professional journalism and the rise of conservative cyber populism – factors that relate to an even broader process of platformization in digital capitalism (Braun and Eklund, 2019).

Among studies that investigate the phenomenon of information disorder, there are proposals to reduce and face the negative impacts that the circulation of lies and distorted information has on social processes and exchanges. Some of them put light on collective responses, such as accountability and regulatory actions; others propose responses that may be considered part of a more "individual" order, such as the ones related to Media and Information Literacy (MIL) – among which this

study is inserted, but without the intention of indicating any primacy of this type of action on other proposals, as if the problem of fake news were purely cognitive or intellectual. The issue of information disorder is complex and, therefore, demands multiple responses in different instances of social life.

In the Brazilian educational context, the theme of media literacy appears in the National Curricular Common Base,[1] which describes young people as "protagonists of digital culture". The characteristics of school life and classroom space may stimulate reflections on media consumption that do not find so much strength in the daily use of digital environments. The collectivity, the contradictions and differences in the interaction process among students and teachers can open space for in-depth debates about texts and other materials found on the internet.

Based on these reflections, this study derives from the following research question: how to address the themes of fake news and science denialism with students in elementary and secondary schools? Through an approach anchored in action research, this analysis focuses on an optional course on these topics delivered to elementary and high school students at a public school in the city of São Paulo, Brazil, during the first half of 2021.

Literature review and conceptual frameworks

Several publications by Unesco (United Nations Educational Organization, Science and Culture) aimed at Media and Information Literacy (MIL) quote the Article 19 of the Universal Declaration of Human Rights: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers". Thus, MIL "equips citizens with competencies needed to seek and enjoy the full benefits of this fundamental human right" (Unesco, 2011, p. 16).

In this context and according to this proposal, teachers have a central role:

> [There is a] challenge to assess the relevance and the reliability of the information without any obstacles to citizens' making full use of their rights to freedom of expression and the right to information. It is in this context that the need for Media and Information Literacy (MIL) must be viewed: it expands civic education movement that incorporates teachers as principal agents of change. (Unesco, 2013, p. 11)

MIL can equip teachers with "enhanced knowledge to empower future citizens" (Unesco, 2011, p. 20). As a result, it should be possible to provide citizens the understanding needed to assess whether media and information channels in democratic societies are effectively fulfilling their functions.

---

1 In portuguese: *Base Nacional Comum Curricular (BNCC)*.

In 2021, Unesco published the second edition of the *Media and Information Manual Literacy Curriculum for Educators and Learners*, which updates some topics of its previous curriculum. According to the updated proposal, MIL combines three distinct areas: media literacy, information literacy and digital literacy. "It moves from what the terminologies mean individually (…) to a unified notion that embodies elements of both information, media, and digital technologies and conveys the aims and objectives of MIL" (Unesco, 2021, p. 8). As a way of organizing these fundamental elements, Unesco proposes the following array:

INFORMATION LITERACY[19]						
Define and articulate information needs	Locate and access information	Assess information	Organize information	Make ethical use of infomation	Communicate information	Use ICT skills for information processing

MEDIA LITERACY[20]				
Understand the role and functions of media, and internet communications companies in democratic societies	Understand the conditions under which media can fulfil their functions	Critically evaluate media content in the light of media functions	Engage with media for self-expression and democratic participation	Review skills (including ICTs) needed to produce user-generated content

DIGITAL LITERACY						
Use of digital tools	Understand digital identity	Recognize digital rights	Assess AI issues	Improve how to communicate digitally	Manage digital health	Practice digital security and safety

Figure 1. Key outcomes/elements of MIL
Source: Unesco, 2021, p. 9.

A literature review carried out by Machete and Turpin (2020) points out that, although there are many studies on fake news and methods or tools to detect them, the number of works that focus on the use of MIL to help people access and critically consume online information is still limited, and the number of studies that emphasize critical thinking as a form of information literacy is even smaller. According to the authors, "critical thinking (…) provides a means to critically engage with online content, for example by looking for evidence to support claims and by evaluating the plausibility of arguments" (p. 231).

In schools, it is possible to articulate critical thinking and science by "integrating controversial, socially relevant issues with scientific content — that is, socioscientific issues (SSIs)" (Chen & Xiao, 2021). Typically, these issues involve cost-benefit assessments and risk, ethical reasoning and individual and/or collective choices. Issues related to the covid-19 pandemic have been considered as SSIs by different

studies — like the ones published by Santos, Costa and Brito (2021), Reiss (2020) and Ke et al. (2021) — an approach that may be considered a strategy of critical reading, contextualized and connected to real situations.

An approach that articulates the investigation of fake news and the study of SSIs in the classroom includes, in turn, the establishment of reading goals. As Stadtler et al. point out, "understanding conflicts between sources is an inherent part of science text comprehension" (2014, p. 93), and having one or more reading goals – preparing a summary, detecting arguments and searching for specific information, for example – is fundamental to achieving such understanding. As pointed out by Kleiman (2016), there is evidence that "our processing and memory capacity improves significantly when an objective is provided for a task" (p. 32).

In this sense, we can say that the activity of classifying online content considered as fake news into more specific categories is a way of establishing reading goals and, thus, promoting understanding and a critical interpretation of the texts presented. According to Unesco (2018):

> Much of the discourse on 'fake news' conflates two notions: misinformation and disinformation. It can be helpful, however, to propose that **misinformation** is information that is false, but the person who is disseminating it believes that it is true. **Disinformation** is information that is false, and the person who is disseminating it knows it is false. It is a deliberate, intentional lie, and points to people being actively disinformed by malicious actors. A third category could be termed **mal-information**; information, that is based on reality, but used to inflict harm on a person, organization or country. (Unesco, 2018, p. 45)
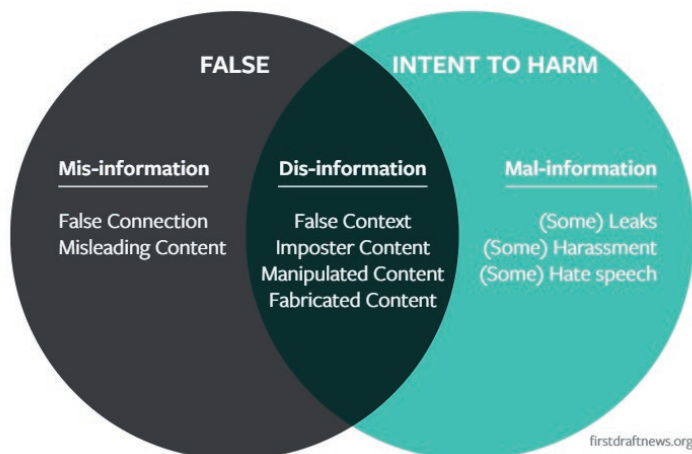

Figure 2. Information disorder: misinformation, disinformation and mal-information
Source: Unesco, 2018, p. 46.

Methodology

This study is characterized as a qualitative research approach of an exploratory nature, and one of its objectives is to know the analyzed process: the implementation of an optional course with fake news and scientific denialism as central themes. We resorted to the action research procedure, which incorporates intervention actions by the researcher. According to Tripp (2005):

> I have come to favour a narrower definition such as, "Action research is a form of action inquiry that employs recognised research techniques to inform the action taken to improve practice", and I would add that the research techniques should meet the criteria common to other kinds of academic research (ie. withstand peer-review of procedures, significance, originality, validity, etc.). (Tripp, 2005, p. 4)

One of the particularities of action research is collaboration: "it includes all those involved in various ways, and it is collaborative in its ways of working" (Tripp, 2005, p. 5).

The present research took place in a public school in a middle-class neighborhood in the city of São Paulo, Brazil, during the first half of 2021. A group of teachers and undergraduate students worked together in an optional course about fake news and denialism offered to elementary and high school students, with the title *Recognizing and fighting fake news and science denialism*.

The course integrated different areas of knowledge (Humanities and Natural Sciences) and had a partnership with an institutional program of scholarships for teaching initiation, with a group of seven Chemistry undergraduate students and two school teachers – a Chemistry teacher and a History teacher – coordinated by a University professor, from the School of Education at USP. There were 32 students enrolled in the course, ranging from the 6th year of elementary school to the 3rd grade of high school.

Due to the covid-19 pandemic, all the activities were remote, through Google Meet platform. The classes happened once a week, on Fridays, from 11 AM to 12 PM. The students were offered 10 classes, from March to June. After the class, the group of teachers had short meetings (of around 30 minutes) to share impressions and plan the following classes.

Data were collected by different instruments: video recordings of the classes and meetings, notes taken during the activities, questionnaires on the Google Forms platform sent to the students of the course, and semi-structured interviews with the teachers and undergraduates who were responsible for the classes. Ethical issues were considered during the activities.

Results

The group of teachers and undergraduate students planned the classes in order to articulate the two main themes: fake news and science denialism. Besides working with examples of fake news and also of good journalism, the central goal was to exercise critical thinking in a meaningful way, so that the students would possibly be able to apply it in different situations.

For the mobilization of scientific knowledge, we considered the concept of SSIs. The teaching team worked with issues linked to the Covid-19 pandemic: what is a virus, the differences between viruses and bacteria, how vaccines work and their importance, among others.

Table 1 shows the dates and main themes/activities of the classes.

Table 1. Classes and main themes/activities

Class	Date	Main themes/activities
1	23/04/2021	Fake news "challenge", part 1 – Examples of fake news and how to search for information and analyze online sources.
2	30/04/2021	Fake news "challenge", part 2 – Examples and initial discussion about intention.
3	07/05/2021	Fake news, covid-19 and vaccines – Study of *Revolta da Vacina* (Vaccine Revolt), which took place in Rio de Janeiro, Brazil, in 1904.
4	14/05/2021	Fake news, covid-19 and vaccines – How vaccines work.
5	21/05/2021	Fake news, covid-19 treatment and vaccines; differences between viruses and bacteria.
6	28/05/2021	The disinformation-misinformation ecology: disinformation, misinformation, mal-information.
7	04/06/2021	The disinformation-misinformation ecology – Activities, in which the students had to classify examples of fake news into the categories disinformation, misinformation and mal-information.
8	11/06/2021	First half: hate speech and deep fake. Second half: the "myth" of the lemon juice "alkalizing" effect.
9	18/06/2021	Fake news and how vaccines are made.
10	25/06/2021	The problems with "covid kit"[2] and the importance of vaccines.

---

2 Also known as "early treatment", a cocktail of drugs supposedly indicated to treat and/or prevent covid-19, despite the lack of scientific evidence. The kit was the subject of journalistic articles inside and outside Brazil. For example: *My wife and I got covid-19. Our doctor prescribed a medication used to treat parasites in livestock* | By Terrence McCoy, in Rio de Janeiro, Brazil, for The Washington Post https://www.washingtonpost.com/world/the_americas/coronavirus-brazil-covid-kit/2021/02/12/8328f56a-6632-11eb-8468-21bc48f07fe5_story.html

Figure 3 shows the "dumpster of fake news", a metaphor we used in the 6th class to debate how fake news is not always "the same thing". The fundamental idea is that a meticulous examination of different texts and materials considered fake news will probably reveal several types of misleading content, such as misinformation, disinformation, mal-information, propaganda, deep fake, hate speech, gossip, hoaxes, jokes out of context, etc.

Figure 3. The "dumpster" of fake news
Translation of the text items shown in Figure 3: mal-information, misinformation, disinformation, hate speech, insult, hoax, rumor, propaganda.

Figure 4 was part of the presentation we used in the 8th class, about the widespread myth that lemon juice has an "alkalizing effect" that improves general health. First, the teacher talked about the acid-base scale (Figure 4), which is part of the curriculum. After that slide, the teacher showed the students a video produced by an influencer that claimed lemon juice had a good "alkalizing effect" (Figure 5), and the students were asked to classify it into one of the categories shown on the left (disinformation, misinformation, mal-information) – therefore, they had to "read" the content guided by some objectives: to figure out what was true and what was false in the statement and what were the influencer's possible intentions with the video.

After analyzing what the influencer was saying, the way she was saying it, who she was, her possible intentions and her background, the group of students and teachers concluded that it was a case of misinformation, probably a mistake.

Figure 4. pH scale
Translation of the text items shown in the image: on the left, "disinformation – false and deliberate", "misinformation – false, but unintentional (mistake)", "mal-information – true, but with the intention to harm". On the right, the pH scale with the examples of stomach acid, lemon, avocado and blood.
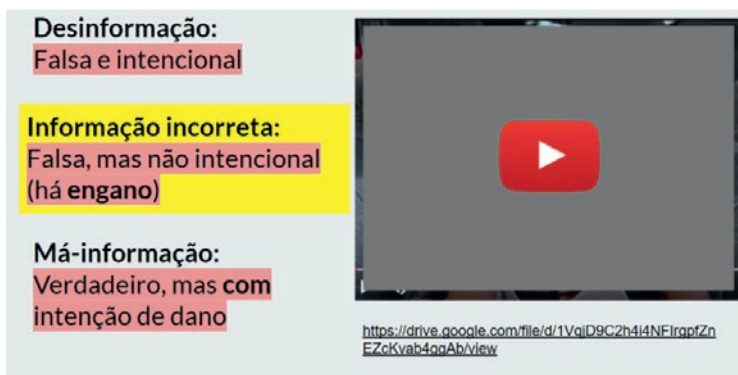

Figure 5. A case of misinformation

Regarding the interviews carried out with the group of teachers, we highlight the following comments about the experience:

a) Chemistry teacher:

I feel more prepared now [after the course] because I went through a path that was not exactly my comfort zone (…). I think it is important to classify [different types of "fake news"], put things in their proper places, provide tools for students to navigate this universe. (…) I think that [the teacher] being neutral [about "fake news"] is a mistake. You have to take a stand and say "look, we're here because this is a problem, and we're here to say that we can't accept it anymore, it's hurting us".

b) History teacher:

I think preparing the course helped us see that it is possible, yes, to talk about this subject, which addresses important and necessary skills for the students. (…)

We managed to create an itinerary, a path, which we saw that can be replicated. (…) I think that [fighting "fake news"] has to be a role [of the teacher], yes, because it reflects on our choices, on our posture, on our education as citizens.

c) Pre-service teacher (undergraduate chemistry student) n. 1:

Just the act of trying to classify ["fake news" into categories] produces some criticism, you are trying to take elements of the text and frame them. (…) I think it's valid even if we can't classify properly. (…) The attempt to classify… This has everything to do with science, classifying things. So, the attempt to classify is already a critical attitude, right?

d) Pre-service teacher (undergraduate chemistry student) n. 2:

I think articulating [science and language] is better, because you can't separate the subjects, since one connects to the other. And usually denialism comes along with "fake news".

Discussion

From the debates and reflections carried out among the group of teachers, it became clear that a course with the goal to address fake news topics and science denialism can combine the mobilization of students' prior knowledge, the development of research skills in the online environment and the analysis of the structure of news and different types of texts found in digital platforms. Thus, the joint work of teachers from different areas of knowledge in planning and conducting classes and activities is a positive point.

The interviews indicate some prevalent reflections and perceptions in the group. One of them is the idea that teachers need to talk about fake news in the classroom and take a stance to combat disinformation/misinformation. The subject of fake news had already appeared in other classes and textbooks, and the teachers considered the optional course as a chance to systematize an approach specifically to the topic. They also considered the idea of classifying posts and texts into more specific categories – as pointed out by Unesco (2018) – as relevant and viable for educational purposes. In all classes, the teachers presented examples and exercises of interpretation, guided by reading goals such as locating scientific information and the main arguments, recognizing the author's intentions, detecting errors and contradictions and, finally, classifying the content or its parts in one or more of the categories presented.

The course brought the opportunity to mobilize knowledge built at school (in the different disciplines and stages) for reflection and information checking activities – as highlighted, for example, by the 8th class, when the relatively simple knowledge about acid and base made it possible to understand why the statement that ingesting lemon juice (acid) would turn the blood alkaline makes no sense. It was possible to articulate different aspects of MIL and scientific literacy – in particular,

critical reading and the use of scientific knowledge in a contextualized way and connected to a concrete situation, in line with the definition of SSIs (Chen & Xiao, 2021).

The need to establish a common ground exists in all teaching-learning contexts. However, this experience also points to the high importance of the teacher's role as a curator (Garcia and Czeszak, 2019) of materials and examples studied in class – especially in an optional course with students of so many different ages and grades.

In the critical reading exercises done in real-time, a detailed approach to the examples studied – at times approaching the material in parts – seemed to have a positive effect. Classes in which the examples were approached slowly so that teachers and students could carry out a more detailed reading of the content, inspired more students to speak up. It was possible to highlight the components of the discursive structure of fake news while resuming the necessary knowledge to understand different issues.

Not simplifying the problem of fake news, therefore, is a fundamental aspect. As we are dealing with a complex problem, it is important to present it as such from the beginning, so that there are no expectations of getting ready-made formulas to solve it. Given the complex scenario of how information and disinformation/misinformation circulate nowadays (Braun and Eklund, 2019), we must combat our tendency to think that there are established and absolutely reliable spaces where "the truth" will always be found.

These results show that this kind of practice involving teachers and students is a way to increase their knowledge and understanding of the media and education relationship "to prepare them in appropriate methodologies in order for the citizens to understand the deeper significance of information, media and being informed, and also to assist people in using information in a more efficient way, preserving the critical and ethical aspects" Arroio (2017, p. 417).

Conclusion

Addressing the issues of fake news and denialism involves cooperation between teachers from different fields and backgrounds, in order to articulate the analysis of the language and discourse structure with the mobilization of scientific knowledge.

This articulation, together with the use of reading goals – here, aimed at classifying examples of fake news into more specific categories in the ecology of disinformation – has shown to be a possible path for the development of critical thinking among students, possibly adaptable to other contexts.

According to the results, the training program on disinformation and scientific denialism contributed to the development of students' media skills, who were able to articulate the conceptual contents about science with contemporary issues that circulate in social media. But it also shows a contribution to the media skills of teachers in service for the development of Media and Information Literacy.

In relation to undergraduate students, it was an important experience in the pre-service training of future teachers, since these themes are not explicitly found as part of the formal curricula of teacher training. In this way, projects like this one of initiation to teaching can effectively contribute so that this professional can better deal with such themes in their future teaching practices related to the fight against fake news, but above all a more critical training to deal with contemporary media.

In general, the partnership between the school and the university with its multiple participants (teachers in service, pre-service teachers, and students) proved to be a good approach for the insertion of the theme of Media and Information Literacy in the practices of teachers.

References

Arroio, A. (2017). Is media literacy an urgent issue in education for all? *Problems of Education in the 21st Century*, 75(5): 416–418.

Barbara, V. (2021). Miracle Cures and Magnetic People. Brazil's Fake News Is Utterly Bizarre. *The New York Times*, https://www.nytimes.com/2021/07/05/opinion/brazil-fake-news-bolsonaro.html

Braun, J., Eklund, J. (2019). Fake News, Real Money: Ad Tech Platforms, Profit-Driven Hoaxes, and the Business of Journalism. *Digital Journalism*, 1–21, https://doi.org/10.1080/21670811.2018.1556314

Che, L., Xiao, S. (2021). Perceptions, challenges and coping strategies of science teachers in teaching socioscientific issues: A systematic review. *Educational Research Review*, https://doi.org/10.1016/j.edurev.2020.100377

Coll, S. (2017). Donald Trump's "Fake News" Tactics. *The New Yorker*, https://www.newyorker.com/magazine/2017/12/11/donald-trumps-fake-news-tactics

Cowie, S. (2018). Brazil: Fake news scandal hits country's presidential election. Al Jazeera, https://www.aljazeera.com/news/2018/10/20/brazil-fake-news-scandal-hits-countrys-presidential-election

Hansson, S.O. (2018). Dealing with climate science denialism: experiences from confrontations with other forms of pseudoscience. *Climate Policy*, 18(9), https://doi.org/10.1080/14693062.2017.1415197

Kleiman, A. (2016). *Texto & leitor – Aspectos cognitivos da leitura*. Campinas: Pontes Editores.

Garcia, M., Czeszak, W. (2019). *Curadoria Educacional: práticas pedagógicas para tratar (o excesso de) informação e fake news em sala de aula*. São Paulo: Editora Senac.

Galhardi, C.P., Freire, N.P., Fagundes, M.C.M., Minayo, M.C.S., Cunha, I.C.K.O. (2022). Fake News and vaccine hesitancy in the COVID-19 pandemic in Brazil. *National Library of Medicine*, https://doi.org/10.1590/1413-81232022275.24092021

Gortázar, N.G. (2022). Bolsonaro and his supporters turn to Telegram to avoid being silenced for spreading fake news. *El País*, https://english.elpais.com/usa/2022-01-15/bolsonaro-and-his-supporters-turn-to-telegram-to-avoid-being-silenced-for-spreading-fake-news.html

Grice, A. (2017). Fake news handed Brexiteers the referendum – and now they have no idea what they're doing. *Independent*, https://www.independent.co.uk/voices/michael-gove-boris-johnson-brexit-eurosceptic-press-theresa-may-a7533806.html

Hughes, H.C., Waismel-Manor, I. (2020). The Macedonian Fake News Industry and the 2016 US Election. Cambridge University Press, https://www.cambridge.org/core/journals/ps-political-science-and-politics/article/macedonian-fake-news-industry-and-the-2016-us-election/79F67A4F23148D230F120A3BD7E3384F

Ke, L., Sadler, T., Zangori, L., Friedrichsen, P.J. et al. (2021). Developing and Using Multiple Models to Promote Scientific Literacy in the Context of Socio-Scientific Issues. Springer Nature B.V. 2021, https://doi.org/10.1007/s11191-021-00206-1

Loomba, S., Figueiredo, A., Piatek, S.J., Graaf, K., Larson, K.J. (2021). Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nature Human Behaviour*, https://doi.org/10.1038/s41562-021-01056-1

Machete, P, Turpin, M. (2020). The Use of Critical Thinking to Identify Fake News: A Systematic Literature Review. In Hattingh, M., Matthee, M., Smuts, H., Pappas, I. (eds.), *Responsible design, implementation and use of information and communication technology*. Cham, South Africa: Springer International Publishing (235–246), http://dx.doi.org/10.1007/978-3-030-45002-1_20

Phillips, T. (2018). Bolsonaro business backers accused of illegal Whatsapp fake news campaign. *The Guardian*, https://www.theguardian.com/world/2018/oct/18/brazil-jair-bolsonaro-whatsapp-fake-news-campaign

Reiss, M.J. (2020). Science Education in the Light of COVID-19. *Springer Science & Education*, 29:1079–1092, https://doi.org/10.1007/s11191-020-00143-5

Santos, P., Costa, N., Brito, A. (2021). Covid-19 no âmbito das questões sociocientíficas: modelando a problemática e traçando possibilidades educacionais. *In Investigações em Ensino de Ciências*, 26(1): 127–144, http://dx.doi.org/10.22600/1518-8795.ienci2021v26n1p127

Stadtler, M. (2014). Comprehending Multiple Documents on Scientific Controversies: Effects of Reading Goals and Signaling Rhetorical Relationships. *Discourse Processes*, 51(1–2): Comprehension and Validation of Text Information, http://dx.doi.org/10.1080/0163853X.2013.855535

Tripp, D. (2005). Action research: a methodological introduction. *Educação e Pesquisa*, 31, http://dx.doi.org/10.1590/S1517-97022005000300009

Unesco (2011). Media and information literacy curriculum for teachers. Unesco, https://unesdoc.unesco.org/ark:/48223/pf0000192971

Unesco (2018). Journalism, fake news & disinformation: handbook for journalism education and training. Unesco, https://unesdoc.unesco.org/ark:/48223/pf0000374458

Unesco (2021). Media and Information Literacy Curriculum for Educators and Learners. Unesco, https://unesdoc.unesco.org/ark:/48223/pf0000377068.locale=en

A strategy for addressing fake news and denialism in Elementary and Secondary Schools

Abstract

Several organizations and researchers in the field of media and education point out to the need to address the issues of fake news and denialism in basic education – themes that have been highlighted in different recent publications and guides for teachers and students, such as the Media and Information Literacy Curriculum for Educators and Learners (Unesco, 2021). During the first half of 2021, it was monitored and supported an optional course on these topics delivered to elementary and high school students at a public school in the city of São Paulo, Brazil. For this proposal it was possible to integrate teachers from school, undergraduate and graduate students from different fields – in this case, Humanities and Natural Sciences – to articulate the analysis of fake news' discourse and language structure with the mobilization of scientific knowledge that is already part of the educational program. This articulation, together with setting reading goals – aimed at classifying different media content into more specific categories in the disinformation-misinformation ecology –, was considered by the teachers as a viable method to structure activities in order to develop critical thinking among students. As categories of fake news, we followed the proposal of Unesco's book Journalism, fake news & disinformation: handbook for journalism education and training – most media content considered "fake news" may be classified as misinformation, disinformation or mal-information (Unesco, 2018). As for the mobilization of scientific knowledge, we considered the concept of Socioscientific Issues (SSI): science-based issues that are socially relevant (Chen & Xiao, 2021). The teaching team worked with SSI linked to the Covid-19 pandemic, vaccines, and, in one of the classes, the "myth" – widespread in the media and among digital influencers – that lemon juice has an "alkalizing effect" and improves general health. This strategy was considered adequate for the course's purpose and possibly adaptable to other contexts.

Key words: fake news; denialism; Elementary School; Secondary School; media literacy

Flávia Siqueira, MA student
  School of Education – University of São Paulo, Brazil
  email: flaviasz@usp.br
  ORCID: 0000-0003-0580-9418

prof. Agnaldo Arroio
  School of Education – University of São Paulo, Brazil
  email: agnaldoarroio@usp.br
  ORCID: 0000-0001-9242-533