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Argument-Checking:
A Critical Pedagogy Approach to Digital Literacy

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ABSTRACT
The digital revolution brought about unprecedented changes in people's daily lives as well as in techno-scientific contexts. In this paper, we address the problem of information overload people experience in online media, news outlets, and social media. The problem is well-known for its negative influence on the quality of online information, with abundant discussion on the promise of fact-checking and the potential role of censorship and moderation by social media. We instead discuss the issue from the perspective of digital literacy; specifically, we advance the view that our procedure of *argument-checking* can enhance such literacy, as a form of critical pedagogy, thereby contributing to improving the quality of online information.

KEYWORDS
Argument-checking, critical pedagogy, critical thinking, digital literacy, information overload.

POSTER

1. INFORMATION OVERLOAD IN THE DIGITAL ERA
The digital revolution has brought about profound changes. These changes do not only concern the technologies and artefacts developed for interacting with reality but have rendered the dichotomous distinction between online and offline obsolete – what we rather experience is *onlife* ([8]). We have entered the so-called "zettabyte era", with an incredible amount of information being shared, and at an incredible speed. The implications thereof reach far beyond amount and speed: digital technologies, and more specifically *information and communication technologies* (ICTs), are changing how we form and perceive ourselves as well as our relationships with others and the surrounding world ([7];[21]).
We wish to focus here on ICTs, and in particular on one consequence of their use: people are confronted with an overload of information that is difficult to assess ([4];[17];[22]). These difficulties concern both the processing of the information as well as putting it to good use. This, in turn, may influence the way in which people see themselves (identity), their relationship to knowledge (manipulation), as well as their perception of the reliability of the source (authority).
In the context of online information, two different aspects of "information overload" stand out. First of all, the *quantity* of information: there is simply too much, and this imposes limits on our time and capacity for selecting and assessing it. Second, the *quality* of information: it is unclear what is true and who is a reliable source. While these are well-known and studied problems ([3];[5]), in this paper we explore the prospects of enhancing people's digital literacy, and especially by means of a semi-automated approach to "argument-checking".

2. "ARGUMENT-CHECKING" AS A FORM OF DIGITAL LITERACY
From the perspective of communication science, information overload is tackled by studying phenomena such as polarization ([10]). Our approach is different in that it focuses on *how* the communication flow contributes to the information overload, namely how *arguments* are used in online settings. In providing tools for analyzing and evaluating these arguments, we also go beyond fact-checking, which we consider a valuable but limited way of fighting mis-, dis-, and mal-information ([2]). While adherence to reality – the facts – is clearly vital for these purposes, there is more than just facts in online information: facts are often embedded in argumentative discourse, true facts can be used to support bad conclusions, many actions are not based on facts only, but also on values, and how we present facts is as important as the facts themselves ([20]).
The limited scope of fact-checking is one motivation for our shift from facts to arguments, but there is another important point to note: more often than not, in online media, people engage with one another in an *antagonistic* and *aggressive* way. Communication seems to be aimed at showing off their individual qualities, promoting individual goals, or winning

arguments by "knocking down" the other party. This, we submit, hinders or even obstructs the efforts of finding a solution for the problems of online communication. We instead advocate "argument-checking" as a way of promoting goals such as collective problem solving, building a shared knowledge-base, reaching consensus about theoretical issues (what to believe) as well as practical ones (what to do). These values call for a more diverse, inclusive, and empowering approach to argumentation, as described in work on virtue argumentation and the ethics of communication ([1];[6];[14]).

Many tools for analyzing and evaluating arguments are developed from a (formal) logical perspective. Our approach differs from this perspective in two ways. First, it can not only be employed by experts in formal logic but by individuals of various educational levels. Second, by closely connecting to the way in which arguments are expressed in natural language, the procedure of "argument-checking" enables the analyst to deal with natural arguments, i.e., arguments as encountered in their everyday lives, including online. The procedure itself consists of a limited number of steps that enable the analyst to find the relevant elements of the argumentation, to reconstruct these elements, and to assess them in a systematic way ([11];[20];[24];[25]).

While existing methods for argument analysis rely on the skills of the analyst in matching the characteristics of predefined argument types with the argument under scrutiny, we take a procedural approach that provides the analyst with a theoretically informed and justifiable analysis and evaluation of the argumentation as it is found "in the wild" ([15]). Because argument-checking aims to promote values of inclusiveness and diversity, and to empower people in the context of online media, we take our approach to be in line with critical pedagogy (see next section).

3. A CRITICAL PEDAGOGY APPROACH TO ARGUMENT LITERACY

We take inspiration and guidance here from the field of critical pedagogy ([9];[16]). Critical pedagogy promotes a specific approach to education, and notably one in which we strive to *empower* students, citizens and, in our case, users and producers of online contents. We aim to empower users and producers of online information by awakening their critical consciousness, and also by providing them with tools that they can put to use: argument-checking as a form of digital literacy.

We would like to emphasize here that our approach does not merely focus on sharpening rhetorical strategies for the eristic purpose of winning discussions or persuading audiences to believe or do something, but considers ways to establish the common aim of advancing knowledge in various communicative contexts. Our procedure for argument-checking is designed to promote the creation of shared knowledge and the improvement of the quality of online information. However, by putting these values first, we don't aim to take a "moralistic" approach, which would mainly consist in calling out offenders for having committed fallacies and addressing imperatives to people that are never going to change their behaviour because it is simply not in their interest to do so. Such a response runs the risk of being counterproductive.

Our approach is a critical one in that we aim to create awareness about these problems and to empower people to do something about it. For this purpose, we provide them with tools for assessing the arguments put forward in a variety of online pieces, and teach them how to use these tools to pursue a diverse and inclusive online space. This empowers people in taking the responsibility to engage with online discussions and, at the same time, gives them the opportunity to master skills that shield them against manipulative persuasion while contributing to a shared knowledge-base or consensus. Specifically, by teaching argument-checking in online contexts, we aim to:

I. Increase the literacy of individuals (as online *users*) to defend themselves against the negative effects of dis- and mis-information;
II. Empower individuals (as online *agents*) to intervene and block in appropriate ways episodes of dis- and misinformation, of trolling, or other;
III. Teach individuals (as online content *producers*) to share and disseminate information online that is of high enough quality.

4. FROM THEORY TO PRACTICE

The analysis and considerations of the previous sections lead us to delineate the main aspects of a long-term project in which researchers, social entrepreneurs, software engineers, and citizens can take part in. We want to build a sustainable community of people that can impact the overall quality of online information and communication. For this purpose, we will develop "argument-checking" as an offspring of a research area known as the philosophy of argument ([26]), capable of offering individuals (users, agents, producers of online contents) tools that help them assess the quality of information and engage with one another in a more constructive and fruitful way ([19];[23];[13]). We explicitly inject values in the design of these tools, e.g., creating a safe learning environment by role-playing and gamification (cf. debate contests). These tools, in practice, can be used to manually annotate online content, as is currently done in MMGA ([18];[12]).

MMGA is a blockchain-based annotation platform (with hundreds of registrants) in which screened and trained expert and/or critical thinking readers can annotate high-impact news sites such as NU.nl and AD.nl, two of the "Big Four" Dutch online news platforms. These tools are also currently explored for their prospects to design KRINO, a glass-box AI engine that can assist humans in a semi-automated process of argument evaluation. KRINO is not a fully-automated engine, but rather aids human agents in analyzing written text and disentangling critical aspects of the underlying argument structure. Our main goal in engaging with this venture is the possibility of positively contributing to improving on the critical thinking and argument-checking skills of users, agents, and producers of online contents.

5. CONCLUSION

We are *onlife*. One consequence of this new dimension, brought about by the digital revolution, is that we need to learn strategies to cope with too much and too fast information. We can't handle quantity, speed, and quality at the same time, and individually. We can't simply rely on an army of fact-checkers – there will never be enough, and possibly they won't cover the topics that interest *us*. A venue worth exploring to improve the quality of online information is to adopt a critical pedagogy approach, to empower individuals – users, agents, and producers of online contents – to critically assess that information. This is the goal of "argument-checking", an approach based on insights from the philosophy of argument made applicable for use in online contexts, that can enhance digital literacy. We believe in the potential of combining human values with the use of digital technologies, and in the possibility that human users, agents, and producers of online contents can make a change in the infosphere, to deliver it to future generations in a better state than it is now.

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