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FAKE NEWS: EVOLUTION OF A RISING CONCEPT AND IMPLICATIONS FOR THE EDUCATION SYSTEM

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1 INTRODUCTION

Today, an uncontrollable proliferation of inaccurate and misleading news stories has led scientists from every country and almost every study field to ask for new policy interventions. Those go from the obligation to insert fact-checking programs by social media companies to the evaluation of possible creation and implementation of new laws imposing charges for the posting or sharing of fake news. Undoubtedly, this can not happen without some highly problematic issues in media policy since often policymakers are the very first that use social media as channels to spread fake news that could move the electorate favourable opinion (Tambini, 2017). For example, the case of the U.S. 2016 presidential election has become quite famous in new media literature since it has enlightened the problem of fake news firstly in America and then, as a reflex, almost all over the world. In the U.S. 2016 presidential election and its aftermath, the impact of fake news, spread both by social media and old media like television and journals, on voters has been enormous both in number of fake news produced, spread and spectacled, and in its quite successful results of polarization of the electorate with apparent consequences on the election results. Candidates themselves, together with their entourage and both followed by their respective activist electorate – conservatives and libertarians – were employed to spread misinformation to discredit their opponent in the eyes of public opinion, until the election itself became a great public media spreadable spectacle (Mihailidis & Viotty, 2017).

To understand the scale of misinformation consequences, scientists have examined how citizens experienced misinformation on social media platforms and initial reports were quite alarming, "showing that the most popular fake news stories in the last three months of the presidential campaign generated more

shares, reactions, and comments on Facebook than the top real news stories" (Grinberg, Joseph, Friedland, Swire-Thompson, & Lazer, 2019). Even results harvested outside of the social media ecosystem were not reassuring, suggesting that the average of American adults saw and remembered at least one fake news story circulated during the 2016 election campaign (Allcott & Gentzkow, 2017). Numbers do not make the situation look better: "27% of people visited a fake news source in the last weeks before the election, with a persistent trend of conservatives consuming more fake news content, 60% of fake news source was visited by the most conservative 10% of Americans" (Grinberg et al., 2019). At the same time, studies of the online media ecosystem found evidence of insulated clusters of far-right (also known as alt-right), and various conspiratorial content emerging from the most obscure online fringe, revealing an increasingly highly polarized and asymmetric media ecosystem (Benkler, Farris, & Roberts, 2018).

Other examples of fake news can be found almost in every branch of society, and they are certainly not less dangerous than the ones used by politicians for propaganda purposes. Another good example of fake news which is affecting public health in the industrialized world from at least 20 years, and that has recently been reinvigorated by the rise of social media, is the anti-vaccines movements' case. Those are individuals – some of which even pretend to be Doctors – sustaining the most different theories about why we should refuse to be vaccinated or decide not to vaccine our children. For example, they accuse vaccine of being the main cause of idiopathic illness; they believe that the obligation imposed by vaccination laws are unjust and claim for their right to choose, and think that an alternative healthy lifestyle combined with personal hygiene and diet will stop the diffusion of every kind of diseases (Tafuri et al., 2014). The rising of the network society, with internet and the creation of social media echo-chambers, might not only condition peoples' perception about vaccination, but it can work as a platform were the ideas of those groups can spread and reach all the people who are in search of information about health and uses internet as their first – and often only – source of information (Zimmerman et al., 2005). A 2001 American study, reported that 52% of the people who visit websites dealing with health topics think that "most of" the

showed information were correct or at least believable (Lenhart, Simon, & Graziano, 2001). Today, with internet availability in continuous expansion, also information about health is everywhere, and so is fake news. This implies that people can access to any kind of content about health even before going to see a specialist, causing their thoughts to be biased by the fake information they have already digested and taken for granted.

It should be clear now why being familiar with the concept of fake news and how to recognize and deal with it is becoming a central argument in many disciplines (e.g., Journalism, Communication Sciences, Political Sciences, Law, Medicine, Behavioural Sciences, Cognitive Psychology, Social Psychology, Sociology, Philosophy, but also Computational and IT Sciences). Trying to get to a clear and neat definition of what fake news is, how it can be recognized, and what kind of consequences it can have on people – and as a consequence on society as a whole – has become essential for every person devoted to science, but also for every responsible citizen.

Another question is the one related to the searching for the best way to counter and limit fake news spread. However, despite its level of importance, both the international educational (e.g., the European Community) and more global humanitarian and economic agencies (e.g., OECD, UNESCO), have still not explicitly made declarations about the fake news problem in their reports, in spite of the great attention they give to the integration process of ICT in the educative system. We could find an explicit reference about fake news only in one phrase of the most recent European report about the role of the ICT in Education, were they declare that: "International scandals related to the misuse of personal data, web-tracking, and the spreading of fake news have put the spotlight on the crucial role that education can play in preparing young people to be digitally mature" (Commission/EACEA/Eurydice, 2019). So, the topic is undoubtedly felt as important, but it has not been debated inside the school discourse.

The research process is also complicated by the fact that, so far, research on this topic has been mainly based on singular "hot" study-cases (e.g., vaccines, political events, climate change, populism, nationalism and conspirational theories). This method, which has provided to be very useful in the very first

instance, is not sufficient anymore. The lack of interdisciplinary research on the topic has not allowed experts to fill the rabbit holes that we still have to explore regarding the role of fake news in the development of our network society. Above all, it has not led to the construction of valid "fake news antidotes".

Some researchers are trying to explore fake news effects on the population's culture, habits, or politics polarisation empirically. However, since the phenomenon is quite new in its relevance and extension, the opportunity to study its effects in the long term is still not approachable. Also, since their consequences in people's daily life and choices are becoming prominent and visible even at a global level, they are tough to demonstrate (especially when researchers try to analyze significant phenomena such as political election results or medical and economic trends).

After having analyzed all these reasons, we decided to choose fake news as the topic of our research because it possesses a high level of importance in conditioning personal choices and behaviors in the information society other than having a considerable level of pervasiveness in everyone's lives. We began to be subjected to fake news since we reach the internet for the first time – a contact that usually happens when we are still children – and we have to deal with their existence for our entire life. This process is also complicated by our lifestyle, where connection and networking through the use of new media are no more a simple commodity, but for the majority of people in western countries have become a constant necessity.

Another reason lies in the fact that fake news has been underestimated for a long time in the Italian educational system, which is still struggling to introduce technology in schools with positive outcomes for students. A problem also increased by the fact that Italian teachers were mostly unprepared (both technically and psychologically) to face the spreading of technology into didactics. The same kind of problem that they should face now that the fake news phenomenon is spreading faster than ever.

These are the reason why we decided to concentrate our first desk research phase on three points, which are fundamental to understand the origin, the importance, and the possible consequences fake news can have if we do not

educate young generations to deal with them. In order to do it, in the theoretical background section, we explored how the advent of the Information Society has changed our way of living and communicate. Then we concentrated on the post-truth era concept, trying to understand it both at a theoretical level and in a practical way, seeing how the uncertainties brought by fake news into the information society have transformed the meaning of the word "true".

As fake news pass primarily through social media channels, which use has increased exponentially in the past few years, the third point of our desk research was devoted to the understanding of the process of creation and functioning of the so-called "echo chambers" or "filtered bubbles".

Then we dedicated ourselves to the study of the fake news phenomenon. We did an extensive review on the topic, analyzing the label in-depth, and trying to understand how it could be studied in the school system context. This also meant to do a vast work of review to establish a more specific definition of fake news to work with and on all the main methodologies that have been used by other researchers to approach the fake news topic in different fields. We have also chosen three different examples to show how the fake news phenomenon has been investigated since now, trying to analyze them to study the pros and cons of every methodology, whether it was qualitative, quantitative, or mixed-method.

To understand how the fake news phenomenon is perceived in the school context, we had to make another review of the current studies on the topic. Unfortunately, we discovered that there are still no specific studies in educational research that analyze the fake news phenomenon in-depth and that there are still few researchers who are trying to create work hypothesis, testing new learning tools both for pupils and for professional training of in-service and future teachers. Most of the recent studies about school and ICT are still centered on other topics (e.g., the integration of ICT with traditional didactics, the use of ICT for immigrant students' integration, the competencies needed to use ICT, or other relevant phenomena as cyberbullying, sexting, etc.).

So, we decided to do an empirical research, building an original questionnaire with all the information gained towards our previous reviews. Using our questionnaire, we tried to give a response about how teachers feel about fake

news. In particular, our fundamental research questions were 1) How have they re-elaborate the definition of fake news 2) What are their representations, feelings and emotion towards the fake news phenomenon, and how they reframe it inside their classrooms 3) If they think that the school system and policymakers should concern about fake news, and make changes to give more space to the critical teaching of new media literacy.

We also concentrated on the role that the audience has in the acceptance and spread of fake news and misinformation, and the emotional engagement that fake news can raise to increase its level of acceptance in personal and collective narratives.

Another critical point of the research was to establish – based on the state of the art of schools' digitalization in Italy (Avvisati, Hennessy, Kozma, & Vincent-Lancrin, 2013) – how the change of educational politics and the willingness to adhere to the Europe standard and aims (already exposed in the 2000 Lisbon strategy (Hervás Soriano & Mulatero, 2010)) have effectively changed the Italian school system. We investigated what teachers think about it and what other changes they would make to promote spaces of critical thinking with their students for the teaching and discussion about fake news and how to deal with it.

In the end, we show the analysis of the data obtained from the completion of 477 questionnaires, mostly carried out by teachers from the Milan hinterland, working in primary, first and second-grade secondary schools and confront the results with the theoretical literature examined in the first phase of the research.

From that comparison and the big gap between literature and reality, we drove our conclusions and answers to our research questions. No doubt being able to recognize fake news, re-work and analyze them could indeed have significant benefits for both the individuals and the society, but that is just a starting point. As the research is advancing, we are discovering and re-evaluating the importance of some cognitive processes and biases, but also the importance that a good training to critical thinking could have in the containment of this dangerous phenomenon.

Thus, fostering teachers and students' capacities to exercise a critical and informed approach to news and information should justifiably become a

fundamental task in education, as it would be the training of in-service and future teachers to let them be able to create a conscious and aware learning environment for their "digitalized" students.

Is fake news a new problem? Is it distinct from longstanding problems with accuracy or objectivity in journalism? Is the controversy rather a response to the scale of current political changes and their way of communicating with people? Are there fundamental changes going on in our Western media systems which undermine traditional journalistic crafts of fact-checking and verification, and incentivize more emotionally resonant content? (Tambini, 2017) Those and many other were some of the questions we had in mind when we started our research with the firm belief that since education is at the very base of a democratic society that was also the starting point to try to give sense and build some antidotes to this annoying trend which is slowly undermining our democracies (Repucci, 2019). Obviously, we could not go that far. Too many factors are involved, including the analysis of the concept of digital competence and savviness that we could not examine in this place.

What we know for sure is that the call for new policy responses to the issue of fake news engages obvious problems of freedom of expression and that this work could – in theory – indicate a path to re-think the concept of democracy. Decisions about the truth or falsity of a statement have tended to be left to journalists and "media." However, excessive control of such decisions could compromise the press' independence and speech rights, but also our ability to exercise critical thinking and make informed choices in every sphere of our life without being manipulated.

2 THEORETICAL BACKGROUND: UNDERSTANDING THE RISE OF FAKE NEWS PHENOMENON

2.1 THE INFORMATION SOCIETY OR HOW DIGITAL INTERACTION IS SHAPING SOCIETY

> Technology is neither good nor bad; nor is it neutral. […]
> Technology's interaction with the social ecology is such that
> technical developments frequently have environmental, social, and
> human consequences that go far beyond the immediate purposes
> of the technical devices and practices themselves, and the same
> technology can have quite different results when introduced into
> different contexts or under different circumstances.
> Melvin Kranzberg (1986: 545–546)

"It is, in my view, the duty of social science to identify and explain the most consequential features of how we live now, the better that we may see where we are headed, so that we might influence where we are going" (Webster, 2006). We felt the need to start from this thought of Frank Webster, one of the most acknowledged scholars of our time in the theoretical study of information society, to express the necessity to make a fast overview of the biggest theorists of "information society" before adventure ourselves in the fake news world. For most people today, there is nothing strange or novel about using digital tools, but for

those who were born before the breakthrough of the internet – and all the subsequent innovation and communication technologies (ICTs) – still tend to refer to it as something new, that has changed the way they were used to live and in some cases as something that has change the life-style and the global economy for worst. In order to have a better understanding of this social and emotional dynamics, we may better give to the reader a theoretical framework in which he can orientate himself and have at least some fundamental elements to enrich and enable his ability to think and look at the world with a critical spirit. To reach this end, we will give just some highlights about how theories of information and the "entering" into an information society have developed over time, without having the pretence to make a complete historical reconstruction.

One hypothesis that could justify people attitude towards the introduction of ICT in our daily lives could be due to the tendency in people's collective imaginary to make a connection between "new" media and social change (Lindgren, 2017). However, media per se are just tools (mainly constituted by platforms) which we can use to obtain, produce, and share knowledge using mutual interaction. Social media have become, as a matter of fact, the epicenter of how we, as groups and individuals, relate both to society — as a structure — and everything that happens within it. Therefore, there should no more be something odd or surprising in reading scientific articles explaining how people make sense of their lives, their sociality, and their role in the world through the relationships they have established towards and inside new media environments. Nor it should surprise us to find new media, and particularly social media, placed in the eye of the storm in this historical phase, especially when it comes the time to reason about fake news.

Social media have become the highway through which the life cycle of news and information (and so also fake news) start and – as anything on the internet – keep evolving without an end. For these reasons, it is unquestionable that knowing how the so-called "information society" has raised and what are its main features and dynamics is fundamental to understand the context in which fake news phenomenon prospers and what is its peculiarity compared to the lies that have always circulated within the information system.

Throughout history, key shifts in technological ability and practice have undoubtedly changed how people relate to the social sphere that surrounds them. Today, any digital media application — e.g., Facebook, Twitter, YouTube, Reddit — is affecting and slowly re-shaping sociality, influencing what we can say, do, or experience. At the same time, people's use of new technologies is also affecting and shaping technologies in return. This is just one of the reasons why social science needs to concern itself with the roles of new media in the transformation and evolution of the social sphere, and to recognize that a precocious study of "new" media – that are undoubtedly harder to approach critically during the time that we are integrating them into our existence – can be fundamental to put on the basis for future studies' development. As scholars, it is our duty, as McLuhan[1] wisely wrote in 1962, to try to capture the new "translation of culture", which happens alongside the introduction of new media technology.

Another expression that is often used to describe the world we are living is the so-called "digital society": We are in an era where our lives, relationships, culture, and our sociality are mostly digitalized, or affected by digital processes. But what does the concept of "digital" mean? How did we get there, and what does it really imply? Even in this case the social transformation into a digital society happened gradually during the 20th century and it is continuously evolving. There have been many attempts to try to explain these changes, every-one related to the specific historical moment in which they have been formulated. As we already said, it is not our aim to enter in the specificities of every theory or explanation formulated by social researchers, but it will be useful for us to take in consideration some aspects observed by those who have dig and made research in the heart of society while those changes were happening. This process should give us the chance to try to reconstruct a framework in which collocate the ICT revolution and how it has impacted on the way we now look at the world.

The starting point will be the emergence of a certain way of conceiving contemporary societies, considering that commentators began to talk about

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[1] The books by McLuhan, Meyrowitz, and Castells are examples — from the 1960s, the 1980s, and the 1990s, respectively — of scholarly writing about new media and social change.

information as something that could be a distinguish element of the modern world at least forty years ago.

We are told that we are entering an information age, that a new "mode of information" predominates, that ours is now an 'e-society', that we must come to terms with a "weightless economy" driven by information, or that we have moved into a "global information economy" (Webster, 2006).

Politicians, business leaders and policy makers have taken the Information Society idea to their hearts, with the European Union urging the rapid adjustment to a "global Information" (Duff, 2000), but have they ever stopped to problematise the concept before using it in their daily practice and as a premise to their decisions? To be sure not to fall in the trap of common sense we will start by making some distinctions and labelled the most important theorists who have made an attempt to do this hard work, dividing them both chronologically and by the approach they adopted. Obviously, attaching labels is always an oversimplification, but sometimes it is also indispensable for the sake of order and comprehensibility.

Even if the majority of scholars have recognised the importance of information flow in our society, they also have very different theories and divergent interpretations about the reasons that make it so central in our present and how it is affecting social, economic and political systems. We will try to explain those different point of view about the existence of the so-called "information society" to problematise the concept through the words of the authors that have work on and with this topic in the last 40 years, in order to use the expression with a certain grade of awareness.

This is the division that we will try to keep, in exposing and synthesising their thought:

On one side, we can position those who proclaimed the raise of a new society that has emerged from an old one. On this side we can find theorists of:

post-industrialism	Daniel Bell, Alvin Toffler
postmodernism	Jean Baudrillard, Jean-François Lyotard
non-representational theory	Nigel Thrifts
the informational mode of development	Manuel Castells

While on the other side, we may find writers who have chosen to place the emphasis on continuities. Some of the most influential are:

reflexive modernization	Anthony Giddens
the public sphere	Jürgen Habermas,

Obviously, none of them deny that information is of key importance to the modern world, but unlike the former they argue that information's forms and functions are subordinate to long-established principles and practices (Webster, 2006).

In the early 1970s, sociologist Daniel Bell had already described the emergence of a future society where handling and relating to information would be at the center of daily life. Bell (1973) used the term post-industrial society — which he later came to partly replace with the notion of information society — to refer to new forms of production and community that he claimed had replaced the previously prevailing forms of communication and power used in the industrial society. He also claimed that this happened because of a strong convergence between telecommunications and computer technologies. Bell's idea was that as the form of work that was predominant in a certain era became too rationalised, and it caused a shift. He argued that what was emerging during the second half of the 20th century was an information society that met new needs rising among the post-industrial workforce. For Bell, the most important thing that was being produced back then were services and he also claimed that information had

become the material of work for the majority of people. His ideas are usually categorised under the "socio-technical" label.

Another proponent of the post-industrial perspective was the futurist Alvin Toffler (1970, 1980), who – partially agreeing with Bell – claimed that mediated information was to become de-massified. Instead of the standardised messages that were transmitted, we were now to get 'narrowcasting', which means that things with small, niche audiences had more chances to survive. Also, in the digital world, they were becoming more important, in ways that they could not possibly be in a situation where mass media had to focus on a small number of topics that could interest huge audiences. In the early 1980s, Toffler imagined that digital media would work very much like they do today. He also predicted that the myriad of small pieces of content offered through digital media would have made people more active in navigating and piecing things together by themselves, re-building their own meanings.

Another often emphasised feature of digital society is that it compresses time and space making them less important as the time pass, i.e., when we send texts, emails or chats, we have no need to be in the same place to communicate, nor in the same part of the world. The exchange need not to happen in real time either, as we can respond to digital messages whenever we want. Bell argued that this changed condition in our daily micro-interaction – brought on by digital technology – contributed to cause a deep social transformation. In his view the power and influence of territorially political authorities would lessen, as would that of history and tradition, and if we can not be sure about how much his idea were right concerning the authority of politics in our times, certainly he made a point for the loss of value of history and traditions. The schedules and timetables that so strongly grounded industrialism in space and time were to be replaced by more fluid and dynamic notions of time and space, also making physical presence less important.

Both Bell and Toffler thought that this development was soak in new opportunities. There would have been no more manual work; people would become more intellectual and friendly and we would assist to the end of "radical politic". Even though the high volumes of information could sometimes be

frustrating, they both hoped for "the death of industrialism and the rise of a new civilization" (Toffler, 1980). Society was to become "more sane, sensible, and sustainable, more decent and more democratic than any we have ever known" (Toffler, 1980). People would no longer be judged only for how much income they could generate. We would all live in a society where environment, care, and education will be the priorities, at the cost of individualism, capitalism and competition (Bell 1973).

Obviously, and unfortunately, none of this happened. On the contrary in certain case the continuous stream of contents that are passed through out digital media are contributing to highlight contents that are not only wrong, biased, and inaccurate, but also dangerous. Even if it is evidenced by the way we conduct our lives that digital tools and information are immensely important to most of us – who would ever renounce to its smartphone? Or to its tablet? Or to a wi-fi connection? – and even if we perfectly know that not every information that is passing through the internet is right, controlled, or even interesting for us, we just absorb them, often unconsciously, and without even interrogating ourselves about the value of those contents (Latour, 2004). Also, digital technology has become an integrated and important part in the majority of common social activities.

Digital information has become a rather vital part for any activity. This is so obvious that even those who might be critical of the theories about the information society still agree that digital information plays a very important role today, even in fields like healthcare or education. Similarly, theorists who have described the late 20th-century social transformations in terms of "post-modernity" argue that the new age is marked by increased symbolic complexity and intensified flows of information (Lyotard, 1984). But even if everyone seems to agree that we now live in a society where "information", in its broadest sense, is crucial, does this automatically mean that the social and cultural changes which have followed from the technological innovations have been enough to allow us to say that the whole society has changed?

After having convincingly argued that we live in a society where flows of information are at the very centre of our lives, sociologist Manuel Castells (1996) writes:

"*However, this evolution towards networking forms of management and production does not imply the demise of capitalism. The network society, in its various institutional expressions, is, for the time being, a capitalist society. Furthermore, for the first time in history, the capitalist mode of production shapes social relationships over the entire planet*".

In making this point, Castells (2010) speaks of a network society rather than an information society. While these ideas are largely overlapping, information society theorists like Bell and Toffler have been attacked by other scholars for being historically short-sighted.

Contemporary social theory has increasingly represented societies in the developed world as characterised by networks, across which information circulates and spreads, and as we will see, networks are at the very base of fake news radicalisation into people minds. Making a step back into the history of information society, we can say that Manuel Castells is still one of the most influential writers on the sociology of digital networks. His concept of "network society" (Castells, 2000a, 2000b, 2012), position networks as the basis for contemporary societies' structure and power relations. In what Castells later characterises as "the information age", industrial processes have been succeeded by electronic communications, extremely facilitated by new information technologies. Power is now seen and perceived as multidimensional, residing mainly in networks, whether they are financial, political, or dedicated to information production inside multimedia networks. All these networks are involved in the process of redefinition of the rules and norms of societies. Castells pays attention to the consequences that free information flows have on those networks and so on society and asserts that digitally mediated information has become crucial also to economic productivity. In his view an information-based society can only produce even more knowledge and information, contributing to

a new information-based economy that is highly interconnected at a global level. According to Castells, digital technologies such as new media have played a major role in the creation of a new social structure, global economy, and to the invention of a new virtual culture. His work has led the way in acknowledging the importance of these technologies in contemporary social formations.

The features of new ways of knowing about the world, new forms of information and novel commercial use for digital data have then received attention from several other sociologists. They have argued that digital technologies have changed the ways in which economic value is produced and distributed and the ways in which commodities are conceptualised (Beer & Burrows, 2013; Featherstone, 2009; 2010; Gunster, 2008; Savage & Burrows, 2007). According to these authors, knowledge itself has been transformed by these processes.

Another voice is the one belonging to Nigel Thrift's (2005, 2006, 2007), who wrote about the information economy and what he entitles as "knowing capitalism". He argues that the capitalist economic system is increasingly turning to information as a source of profit, sustained by the increasing rate of innovation and the reconfiguration in the user's mind of the concept of space and time. The characteristics of the internet have contributed to this shift in the paradigm. Digitisation – when used correctly – has the effect of transforming knowledge into pieces of information that can be easily accessed and digested by users via digital technologies. The internet is configuring the possibility of creating a new scholarly apparatus that can engenders different modes of research, knowledge and communication (Featherstone, 2009). The internet empires (or 'megaplatforms') of the Google, Facebook, Apple and Amazon companies have contributed to change the ways in which knowledge is produced while taking power in the digital world. For example, Google is viewed as exerting a powerful effect not only on the ways in which search engines operate and the aesthetics of platforms and apps, but also for the education tools, academia and information services, social research, advertising, geographic services, email, publishing possibilities and web commerce (Lupton, 2014).

In a certain way, every act of communication done via digital media has become a valuable entity since it can be transformed into digital data that can be

aggregated into massive data sets. Many commercial, government agencies and several organisations now collect and use digital data for commercial purposes. The intellectual labour of the masses has gained monetary value, constituting a new form of information economy (Smith, 2013; Thrift, 2005; 2006).

It has also been argued that power relations are shifting now that things and places has become ubiquitous. Power now operates principally through communication (Lash 2007; Mackenzie 2005; Mackenzie and Vurdubakis, 2011; Smith 2013). Instead of the structural model of power that tended to represent societies as systems with fixed hierarchies, this approach views power as horizontal and fluid. The mass media are no longer theorised as 'top- down' mass persuaders, able to manipulate the masses to which they are disseminated and representative of the monopolistic concentration of power over public. Rather, it is acknowledged that the new mobile and interactive media embodied in Web 2.0 are dispersed, multimodal, a web of nodes that incorporate the attitude of users to create new content freely, but also keeps a constant surveillance, doing information- gathering activities on users (Beer, 2013a; Beer and Burrows, 2010; Lash, 2007; Smith, 2013).

While the old media exerted power over the content of the messages they disseminated, but had little knowledge of their audiences, the new media not only incorporate content from their own audiences but know their audiences in detail (Beer, 2013a; Best, 2010; Featherstone, 2009). Lash (2007) argues that via the newly digitised information economy and its 'neo-commodities' of data, a type of 'post- hegemonic power' operates in increasingly subtle ways. This 'leaking out' of power from the traditional hegemonic institutions to everyday taken-for-granted practices has given the start to mechanism we don't even understand anymore. For example this could mean that the age of ubiquitous computing, ubiquitous media and ubiquitous information is also that of ubiquitous politics (Lupton, 2014) and, we could add, the one of ubiquitous surveillance and ubiquitous fake news. For Lash (2005; 2006), the global information society is characterised by openness of systems, non- linear movement and flux as well as flows of information which are constant but also discontinuous in their production. He underlies how flux is characterised by tensions, caused by the struggles for power,

whereas flow presupposes unrestricted movement of information. He argues for the importance of problematise the smoothness of flows of information, 'to develop a global politics of flux versus flow' (Lash, 2005). This distinction between flux and flow of digital networks and data contravenes a dominant representation of digital data as circulating freely (as in the more utopian visions of writers such as Castells) and emphasises the presence of difficulties and blockages in the flows of free information in the global information society.

In the end, it is not that important really whether one should label our present-day society 'post-industrial', 'post-Fordist', 'post-modern', or as an 'information society' or 'network society'. Labels can always become dangerous since "labels, like rumours, can take on a life of their own" (Kumar, 2009). Once sufficiently established, they can govern reality or, at the very least, scholarly reality.

Indeed, there might also be ideological reasons for choosing certain concepts for describing things. 'The information society' and some of its related notions fit quite well with Western neoliberal thinking. The idea that innovation and technology will lead to a richer and hence better world maintains a faith in progress and rationality. It is no secret today — with debates about surveillance, digital labour, consumer profiling, targeted advertising, fake news and internet governance — that the information society idea is more related to big business and large-scale politics than to an equal and free world.

There are many ways of collectively naming the interactive activities and environments that people engage in online. In digital society, people in general are increasingly networked an interconnected through the internet. As we already said, it feels like this global network of computers, which enables an unmeasurable amount of social activity around the world, was always there. Castells (2002) writes that the birth of the internet – which became widely available in the mid-1990s, through the invention of a protocol for the World Wide Web – happened at the rather unlikely intersection of science, military interests, and libertarian culture. By 1998, all countries worldwide were part of the network. Since then, tools using the internet infrastructure — such as the web, social media, and mobile apps — have become a crucial part of people lives, of how they obtain information, communicate, and interact. This digital and cultural

ecosystem provides us with a language for relating to each other and the world around us. In that sense, we can consider the internet as a medium.

From the perspective of media ecology, the internet — as an intrinsic part of digital society — is a medium because it is an environment. And conversely, it is an environment because it is a medium. Media ecologists such as McLuhan (1964) and media theorist as Neil Postman (1970) have maintained that media must be defined as something more wide-ranging than the traditional informational devices – such as radio, television, newspaper, movies, and so on. Instead, they argued, a medium is a symbolic structure, or social environment, that in some way, and under certain circumstances, defines human interaction and the production of culture.

In a similar way, from a media ecology perspective, classrooms are also media, because as environment they offer certain ways of relating to the world, while at the same time establishing boundaries for what can be said, done, learnt, or achieved. So, sociologically speaking, this means that media, like the internet, are social structures. According to sociologist Anthony Giddens (1984), social structures consist of two dimensions: first, the rules implicated when social systems are produced and reproduced; second, resources — symbolic and materials — that people can tap into while doing things in society.

People in society enter different roles and stages, while performing socially with a certain degree of agency, but always in relation to limitations or expectations. The environment of the interaction thus affects what we do, and how we do it. From the perspective of media ecology, media are such kind of environments: symbolic structures within which we are situated and through which we engage with other people (Lindgren, 2017).

In a way, the reality we sense is constructed or reconstructed through the medium at hand. Famously, McLuhan (1964) defined media as 'extensions' of our senses that decide how people experience and become aware of the world around them. This also relates to what McLuhan meant when he, even more famously, declared that 'the medium is the message'. Switching from one medium to another reconfigures our senses and alters the ways in which we comprehend and reconstruct the world around us. In his view, there is a symbolic level, at

which every medium is constituted by a certain systematic set of rules and codes in the form of vocabulary, grammar, graphics and other conventions. As we learn its rules, skills or attitudes, we are at the same time socialising and acculturating ourselves into the symbolic environment of the medium. In this sense, a medium is quite similar to a culture that is used to make sense of the world. Media ecologists even talk about some major changes throughout history and how these lead to crucial social transformations.

Today, we live in a world with a growing number of co-existing media, which means that we relate not to one, but to a combination of several environments. McLuhan (1964) has been one of the first to think to focus on understanding media in terms of the ways in which they transform the social.

Media scholars Jay David Bolter and Richard Grusin (1999) felt that McLuhan's notion of media might not be refined enough to describe the direction that media process has taken in digital society. On the one hand, they show how media can be experienced at different levels, from the more superficial one – the simple graphic impression they make to us – up to the analysis and confront of contents, could contribute to give to the user a sense of immediacy. Thus, the content of digital media might be experienced in very immediate ways, without even having the time to process the information we are gathering in that environment.

Digital media also affects the social by playing a large role in processes of mediatisation. Mediatisation describes how media have become an increasingly entangled part of our realities, a process that is accentuated by digital technology. This is not only in terms of how the mere quantity of media platforms and communication tools have increased. It is just as much about qualitative changes in how media communication is dispersed in new ways — temporally, spatially, and socially in digital society. Technologically mediated communication is now accessible all the time, and almost in any place, so that more and more social settings are affected and shaped by communication through media.

Media scholar Stig Hjarvard (2013) provides a clear definition to understand how the "specificities of media" can come to influence other institutions and culture and society in general. He argues that the logic of the media influences

the social forms of interaction and communication and makes a point about political communication and how it is performed in the media. A topic that is also essential for us to understand how and why fake news have become such an important, pervasive and dangerous phenomenon. Different media distribute resources differently, and adhere to different formal and informal rules, opportunities, and limitations, but – as we will see – fake news seems to be able to evade from limitations without generating any kind of disapproval.

While terms can differ — one might speak of online media, new media, 'new new media' (Levinson, 2012), networked media, social media, participatory culture (Jenkins, 2006), spreadable media (Jenkins et al., 2013), etc. — what has been called digital media is seated at the centre of an ongoing process of social transformation that include the fact that truth is no more so valued if the narration and the content are enough appealing. This process is strongly connected to the societal changes that result from the deep and continuous use of technology and the possibility to interact and shape social media content directly. These changes include new textual experiences in terms of genre and form, new ways of representing the world, new relationships between people (producers and consumers, teachers and students, politicians and citizens, and so on).

Sociologists David Beer and Roger Burrows (2007) identify three interrelated areas that especially require sociological engagement. These are: (1) the transformed relationships between the production and consumption of content. (2) the increasing amount of private information posted in the public domain. (3) the emerging new rhetoric about democratisation and participation. As more and more people participate in an increasing amount of production of digital content, posting it to a number of networked platforms, huge amounts of data about strategies, choices, sentiments, views, preferences and so on are also registered and made available. While this development relates to problems of data ownership and the exploitation of these data, it also generates new opportunities and new question about how living in an information society, surrounded by any kind of technologies and having new kind of opportunity is re-shaping also people system of values.

2.2 THE POST-TRUTH ERA OR HOW FACTS BECAME FUTILE

Another concept that we need to explore to understand deeply the fake news phenomenon, and how its massive spread has been possible, is the concept of post-truth. In the last decade, in the network society context, this new and extremely vogue term has emerged in both national and international politics and sciences. It is used mainly to suggest that we are living in an age where every kind of discourse– and above all politics discourse – no longer functions through rationality and does not need real proof to sustain it. It is used mainly to suggest that we are living in an age where every kind of discourse– and above all politics' discourse – no longer functions through rationality and does not need real proof to sustain it. Facts have lost their primary importance and have become second to personal opinions and alternative narratives. Even the concept of "truth" has been replaced by arguments and discourses that appeal to people – and so to the electorate – on a more visceral and emotional level.

Post-truth was also the Oxford Dictionaries Word of the 2016 year, and it was defined as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief" (The Oxford Dictionaries, 2016). Even if the history of the concept is very brief, Oxford Dictionaries notes a spike in relation to Brexit and Trump's election as US president and the rise of the compound noun post-truth politics as a description for our times. Oxford Dictionaries also notes earlier formations with the Post stem like post-national (1945) and post-racial (1971) and they trace its use in a variety of media before it became a general description and characteristic of our age. It ought not to be a surprise that the 2016 shortlist also included both "Alt-right" - "An ideological grouping associated with extreme conservative or reactionary viewpoints, characterized by a rejection of mainstream politics and by the use of online media to disseminate deliberately controversial content" and "Brexiteer" – "A person who is in favour of the UK withdrawing from the European Union" (Peters, 2017). This can be taken as a sign regarding how much the term post-

truth is strictly connected to our time and to what is happening worldwide at a political level. If the definition does not mention any connection with the post-modernity current of thought, it surely makes reference to "mainstream media".

Casper Grathwohl, president of Oxford Dictionaries declared: "It's not surprising that our choice reflects a year dominated by highly-charged political and social discourse. Fueled by the rise of social media as a news source and a growing distrust of facts offered up by the establishment, post-truth as a concept has been finding its linguistic footing for some time" (Steinmetz, 2016).

Mentioning social media and distrust of fact is a perfect way to open to the concept of fake news. In what other conditions, if not in the information society – where every single person is potentially connected to one another – and in the post-truth era – an historical period in which facts does not count as much as the ability to tell them – could have we create the perfect combination of factors for the rise of fake news?

Donald Trump has been one of the first "big politician" to come up with something new, which we can call the "big liar" technique. Taken one at a time, his lies are contained and simple, easily understandable, but also constant, continuous, and never acknowledged (Krugman, 2016). His continuous presence on any kind of media – and above all internet and social media – has made him a worldwide icon, that can be conservative and religious and at the same time make a speech under the rain claiming that the sun is raising above him and his followers. Arguably, the group of people who kept following him believing in undefendable lies is a group of low educated people, more open to conspiracy theories, and less likely to change their deeply beliefs even in the face of evidence. The style of Trump campaigning and the turn to anti-globalization protectionist policies has led to what has been called "post-truth politics" based mainly on appeals to emotion, mostly delivered through video and social media, especially Twitter, which clearly is not the social media most suited for argumentation, disputation, reflection or fact-checking. So, we can see how the raise of fake news and their popularity is strictly linked with the chances gave to us by the information

society and the non-critical use of social media to unconsciously consider facts as futile.

Drawing from Hancock (2007), Whitty and Joinson describe the truth-lies paradox as follows:

"If the technology itself is both an enabler of honesty and deceit, one needs to look beyond explanations rooted in technological determinism in order to fully understand people's behaviour online. Specifically, we would argue that to understand the nature of truth and lies online, one needs to look at the context in which people act alongside the person themselves. We would also argue strongly that truth and lies are not mutually exclusive, and that in much online interaction people are strategically managing their online identity to meet both their own goals and the expectations of the other. While doing this, they are also balancing their actions with the norms for the site or community in which they are active" (Whitty and Joinson, 2008, p. 143).

Finally, Whitty and Joinson place "trust as central to the truth-lies paradox" (Whitty and Joinson, 2008, p. 143). For Hancock (2007) and Whitty and Joinson (2008), truth is dialectically intertwined with trust: I trust you, because I expect that you are telling the truth.

Before the post-truth era truth, truthfulness, and truth-telling were seen as a necessary precondition for society, while lying was bad because it could harm people through false information and because it was a violation of trust (Rachels and Rachels, 2011). It was also considered as something able to interfere with the process of self-understanding and that perverted our relationship to the world and to other people. But as Anna Arendt argued, "Facts need testimony to be remembered and trustworthy witnesses to be established in order to find a secure dwelling place in the domain of human affairs" (Peters 2015). And one major consideration about the shift of paradigm to post-truth is the "truth carrying capacity" of new social media and the propensity to disseminate fake news through Facebook, Google, and Twitter, and thereby to create a "bubble world" where algorithmically selected news sources simply reinforce existing prejudices thus compromising the capacity not only for moral thinking, but also to remain a

solid testimony towards true facts. Another question comes into mind: does the new social media undermine our ability to recognize truth?

In this post-truth political environment, Gay Alcorn (2014) notes how "facts are futile". Post-truth is often taken to mean also "post-fact". It is not so much that facts are futile, it is just that they take a while to collect and marshal into a knockdown argument. By the time the facts are gathered, the media moment has passed, the headline has been grabbed, and the lie can be modified, apologized for or replaced by another. When the right to free speech meets social media, it morphed into the ability to say and spread anything.

The notion of "facts" and "evidence" in a post-truth era not only affects politics and science, but also becomes a burning issue for education at all levels. Education has now undergone the digital turn. but criticality has been avoided or limited within education, and substituted by narrow conceptions of standards and state-mandated instrumental and utilitarian pedagogies. There have been many attacks on the professional autonomy of teachers all over the world, but if education is equated almost solely with job training rather than a broader critical citizenship agenda for participatory democracy, we can expect the further decline of social democracy and the rise of populist demagogue politicians and alt-right racist parties. In the era of post-truth, it is not enough to revisit notions or theories of truth, accounts of "evidence" and forms of epistemic justification as a guide to truth; we need to understand the epistemological implications of post-truth politics, sciences, and education. More importantly, we need an operational strategy to combat fake news, and its role in a global society. We need to be prepared to accept cognitive dissonance and the subordination of truth to Twittered emotional appeals and irrational personal beliefs.

The post truth political discourse could be represented also by a claim that is prevailing in the public discourse and in people's unconscious, stating how "people have had enough of experts" (Clarke & Newman, 2017). This statement is the exemplification of a deliberate and voluntary attitude that implicitly ask people to be blind to evidences, to mistrust authority, and has developed the ability to attract people based on arguments rooted in their fears or anxieties. This

is the reason why today we can speak about the "politics of affects" and reflect about how it is changing and shaping our collective identities (Hoggett & Thompson, 2012).

Twenty-five years ago, Baudrillard wrote that "we live in a world where there is more and more information, and less and less meaning" (1994, p. 79) and that "information is directly destructive of meaning and signification" (1994, p. 79). These are both phrases that could have been written yesterday. The proliferation of information in contemporary society has indeed afforded more opportunities for dissent, but also created more opportunities for the rise of misinformation, and more opportunities for any opinion, no matter how poorly formed, to be shared in a quite formal and attractive way to find validation. This complex and at the same time very easy mechanism is giving the chance to everyone to find their personal truths confirmed in the Web thanks to the smart use of emotional engagement as a means to penetrate into peoples' mind and guide their behaviour (de Guinea & Markus, 2009).

Obviously the "lies" the phenomenon is not a novelty but rather a change in the level of intensity thanks to the technologically mediated social relationships through which information travels. Technology made it easier to find groups to which individuals can aggregate. It helped to amplify the phenomenon just by the creation of bigger networks through the filter bubbles phenomenon, another thing amplified by the existence of algorithmics that guide people into their navigation in the world wide web, helping them to find other people with the same idea and interests, giving them the chance to find social reinforcement for their own personal truth.

Another element we have to underline is how information have been designed to put under evidence contents that appealed to a more emotional than rational level. This kind of contents are more likely to be shared or opened coherently with the rule by which the value of online content is mostly measured not by its veracity but by its reach and visibility.

To manage information is to provide a filter about what is worthy to be red and what is not, a choice that most people are not prepared to do by themselves. This is due also to the fact that traditionally information filters have been based on

much simpler criteria, like: rational assessments of authoritativeness, currency, and coverage, but also in the perception people had about the reliability, availability, and precision of the source of information (Laybats & Tredinnick, 2016). Of course, it is not a novelty that emotions play an important part in the way people perceive and embrace information, but today this dynamic is exponentially increased. Emotions provide a precognitive filtering of experience and judgment and people who create and spread information (whether they are true or false) on the web, and especially through social media are well aware of this mechanism (Laybats & Tredinnick, 2016).

As we enter into a (virtual) world in which information is ubiquitous but often untrustworthy, understanding how to evaluate information is becoming a critical part of the future skills sets of the information judgement. If we give a look into literacy it is easy to discover that the traditional remedy proposed by experts for fighting misinformation has always been the teaching to new generations of information literacy, digital literacy, and critical reasoning skills (Luke, 2011). This should allow people – and above all new generations – to filter out unreliable information, a process that, unfortunately, has not found yet its way in the educational system, leaving people unharmed in front of the many trap of the post-truth era.

2.3 SOCIAL MEDIA, ECHO CHAMBERS AND FILTERED BUBBLES OR THE EXASPERATION OF "MASS" THINKING

Sociological researches have revealed that people's sense of personal experience may include experiences that are not their own. Narrators often use the personal pronouns "we" or "you" when they write. The consequence is that using an involvement kind of language personal story can become collective. It can also happen that narrators tell events using the pronoun "we", even if they

didn't actually live the experience. This suggests that the deep story may have been lodged not in directly lived experience, but in the shared stories of the group. Sharing stories help to constitute the group, reinforcing its values and demarcating its boundaries. Narration also reinforce collective and partisan identities. Bakshy, Messing, and Adamic (2015) show how social networks platform give the chance to ideologically segregated groups to find a place where they can share contents freely.

We have already notice how people are far more likely to read and share news articles that are aligned with their ideological positions. This may suggests that people who primarily get news from social media are less likely to receive evidence about the true state of the world that would counter an ideologically aligned but false story (Allcott & Gentzkow, 2017). Social media platforms also allowed people to produce and share stories easily, taking information from diverse sources, with risible costs, reaching in the end an uncountable number of people. Furthermore, the fact that on social media platforms there are still no third-party filtering, fact-checking, or editorial judgment is one of the main reasons why social media platforms may be especially conducive to fake news and is also one of the premise that allow us to understand why people believe so easily in fake news (Sundar, 2016). Finally, there is a component of aspect: the format in which news are shared on social media platforms — slices of information, mostly composed only by a captivating title and an image, made to be consumed fast — can make it almost impossible for the individual to judge an article's veracity (Allcott & Gentzkow, 2017).

Another aspect derives instead from the pleasure that comes from reading and sharing news that are catching the public attention. Jean-Noel Kapferer (2013), an expert in the literature about rumours, argues that "rumors are a kind of conversational capital". The person sharing the rumor "provides information that is scarce, exciting, and moving" (Kapferer, 2013). In return, he gains the pleasure of pleasing others and has the sensation of being listened to. It does not even matter if the rumours are true or not. Or as Gary Alan Fine (2007) says it, rumours are "too good to be false".

Sharing rumours also produces a feeling of solidarity inside the group. Above all, as Fine (2007) underlines, if the rumours reflect a distrust towards social institutions, it creates a sense of trust in the rumour-sharer (Fine, 2007). When this dynamic is activated, sharers do not think they have to assess the validity of the story and this is another way to signal how much a person feels his commitment to the group. The use value of the story in reinforcing a specific identity is more important than the true value of the story (Polletta & Callahan, 2017).

Following Potthast et al. (2017), we can say that in social media a certain kind of "news" spread much more successfully than others, and that these 'news' are "typically extremely one-sided (hyper partisan), inflammatory, emotional, and often riddled with untruths". They also notice how "fake news is hardly ever devoid of truth. More often, true facts are misconstrued using argumentative fallacies to influence a person's opinion" (Potthast et al., 2017).

This observation seems particularly important when we think about social media, where information is exchanged, leading to a constant and hyper-fast negotiation of meanings. This extremely rapid exchange of tons of information between people adds an important and not ignorable layer to the construction and spread of fake news, since their power lies also on how well they can penetrate different social spheres (Dahlberg, 2007). As we have just seen, social spheres are commonly strengthened by information and narrations exchange; therefore, the quality of information becomes secondary. Authors even say that "social media is the lifeblood of fake news" (Tandoc, Lim, & Ling, 2017) because they are far way more efficient and affordable than traditional media (Joselit, 2017; Tandoc, Ling, et al., 2017). Another way to say it is the one chosen by Allcott & Gentzkow (2017), whose spoke about how the excess of diverse viewpoints makes it easier for like-minded citizens to form "echo chambers" or "filter bubbles" (Pariser, 2011; Sunstein, 2001).

In a recent article, Spohr (2017) draws attention to the filter bubble phenomenon and its consequences of contemporary mediated content and its influence on forming and shaping radicalised opinions (Spohr, 2017). In several articles it is suggested that when people are on line they live in their own bubble

of content created by the personalization algorithms of social media services, which feed us content we could be in tune with, and filter out content that we might find objectionable, unpleasant, or uninteresting. There are two opposing arguments about the source of this growing ideological polarization in online media consumption. Some theorists claim that the algorithms that filters our online experiences effectively places us in echo chambers which are the stronger cause of polarization (Pariser, 2011; Rader and Grey, 2015) and a critical factor in the growing importance of fake news. The other source of polarization has its roots in psychology and behavioural economics. By this argument, selective exposure behaviour, confirmation bias and availability bias that make us more likely to interact with content which confirms our pre-existing views are the more likely trigger of ideological polarization, both offline and online (Frey, 1986; Klapper, 1960; Stroud, 2008). These two theories mirror the image of internet as an echo chamber in which our views are simply repeated back ad infinitum. In some ways, these are useful metaphors drawing attention to the narcissistic undertones of social media. But in other ways, they fall short by over-emphasizing technology's role in mediating social relationships and by attributing irrational levels of power and efficacy to algorithmic processes.

The growth of knowledge fostered by an always more interconnected world, assisted also by an unprecedented acceleration of scientific progress, has exposed the society to an increasing level of complexity to explain reality and its phenomena. It is undeniable then that a shift of paradigm in the production and consumption of information and news has occurred (Balmas, 2014; Lucassen & Schraagen, 2013).

Social Media vs Journalism or what can we learn from fake news

In these days, Social Media Network like Facebook and Twitter are playing an essential role in the spread of misinformation (Batchelor, 2017). They are described by Lin et al. (2016) as an "interactive, collaborative, conversational, and community-based systems" built upon "the ideological and technological foundations of Web 2.0" (Kaplan & Haenlein, 2010) that have completely changed

not only the way people communicate, but also how they process information (Lin, Spence, & Lachlan, 2016).

As social media has become an important source of news for journalists, there are increasing concerns about the reliability of news in general. That's primarily because today journalists have to identify relevant information and trusted sources quickly, to remain competitive on their field, risking also their credibility to come first on the news. Problem is that lacking ways to identify what is true and what is not at the source of online information is putting the curation of high-quality journalism at stake, and a high and always increasing portion of people are getting their every-day news from social media, where also fictional stories are presented in a way that makes it hard to distinguish them from what is authentic (Schifferesa et al., 2014).

In fact, the process of searching for "the root of misinformation" on social media is particularly challenging. The first problem is that it is difficult to track down the original source of the information, because often the identity of the primary author remains hidden. Second, on social media people aren't bound to standard ethical protocol followed by traditional publication, and citations are often neglected, leading to an impossibility to verify the nature of information and the sources. Finally, the process of sharing and spreading, which is the basis of social media functions, leads to an inevitable transformation and evolution of the content. A transformation process which happens in the news spreading phase and of which we still have limited understanding (Jang et al., 2018).

However, given its daily presence in many users' lives, social media may also offer an opportunity to combat misinformation exposing people to accurate information. The lack of gatekeepers on social media enables the creation of an environment in which evidence-based information can exists side by side with personal opinion and poor quality data (Ennals, Byler, Agosta, & Rosario, 2010). Also, the creation of new media captivating creations, such as visual memes, can facilitate very fast transmission of information, allowing every kind of message and content to spread virally in a "rapid, efficient and vivid manner" (Nahon & Hemsley, 2013).

"The fractured nature of the Internet" tends to send information seekers down infinite different paths, merely depending on the search terms they choose to use (Bode & Vraga, 2015).

But even when they are able to find the source of a news, how do people judge its credibility? Is it still a fundamental notion for people to judge news veracity? Studies demonstrate that source reputation is still a key determinant of credibility, yet as we already said source information is often missing or difficult to determine. Plus, the lack of gatekeepers on social media makes editors credibility questionable, above all when they speak about breaking events, crisis, and news from political campaigns because contents posted too quickly often lead to misinformation or rumors which can not be verified. But in today's digital world an information, even if it is biased, can be rated as more credible than an information that challenges beliefs. "From a user's perspective, sources that are highly gratifying are seen as the most credible" (Johnson & Kaye, 2015).

Social Media vs Democracy or why fake news makes them enemies

Current social media systems provide a fertile ground for the spread of misinformation that is particularly dangerous for political debate in a democratic society. In fact, they function just like an amplifier to anyone who has the ability, or the power, to attract followers. This enables small numbers of individuals, who are in possession of technical, social or political know-how, to share high volumes of fake news.

Misinformation on social media is particularly dangerous because it enables the creation of echo chambers, which tends to exacerbate polarization up to the point where a debate between different part is no more possible (Spohr, 2017). With no conflicting information to counter the falsehoods within isolated social groups, the final result is a lack of shared reality with other social groups, which may be not only divisive but also dangerous to society (Benkler, 2017; Pegrum, 2010). Plus, once embedded, these ideas can be used to create scapegoats, to normalize prejudices, to harden us-versus-them mentalities and even to catalyze and justify acts of violence sustaining conspiracy theories (Gabriel & de Cock Buning, 2018; Pennycook, 2016; Vosoughi, Roy, & Aral, 2018a). Thanks to the

power of new social media platforms their audience goes far beyond partisan ideologues to reach the larger segment of the public that is less politically attentive and engaged, and so less well-equipped to resist messages that conflict with their own view (Feldman & Zaller, 1992; Kenski & Zaller, 1993; Zaller, 1992), and that are more susceptible to persuasion (Brewer, 2001). Being echo chambers highly homogeneous and composed by like-minded people (Ratkiewicz et al., 2011), they can create the ideal habitat for selective exposure and confirmation bias. They are also extremely dense and clustered (Conover, Gonçalves, Ratkiewicz, Flammini, & Menczer, 2011), so that messages can spread very efficiently, and each user is exposed to the same message from many sources. In these segregated communities hoaxes have the highest chances to go viral (Lazer et al., 2017; Nahon & Hemsley, 2013).

In fact, the echo-chambers mechanism is also what makes the politicization of science for personal purposes possible. It constitutes inaccurate or totally incorrect information that is disseminated and multiplied by social media sharing. Despite the existence of this "filtered bubbles", real science can not avoid the utilisation of social media to disseminate accurate information and debunk misinformation, since the "competition" of fake news, alternate facts, and pseudoscience will be won or loose on this networked ground (Grech, 2017; Punjabi, 2017).

3 WHEN, WHERE AND WHY FAKE NEWS BORN

3.1 UNDERSTANDING MEDIA MANIPULATION

In this section, we try to make clarity into how countless internet subcultures –an amalgam of trolls, conspiracy theorists, nationalists, "alt-right" members and exponents, anti-feminists, anti-immigration activists, and uncountable bored young people – leverage on the techniques of participatory culture and a smart usage of social media to spread their messages (King, 2008) With the passing of time our understanding of online subculture and communities has come the realization that they are not mere recreations of offline communities and groups, but have showed themselves to be unique specific cultures with their own values, norms, rules, sanctioning mechanisms, and shared history (DiMaggio, Hargittai, Neuman, & Robinson, 2001). Nonetheless, it is out of doubt that offline category boundaries and statuses still matter in the "bodiless void of cyberspace", because they influence users in their research for new communities on the web, where they can feel represented and complemented rather than displaced. Also, internet subcultures have the peculiarity of letting people feel reinforced in their vision of the outside world, often presenting themselves as the only place capable of making people feel integrated and in power of producing real changes in the society (Schell & Holt, 2009).

These groups are able to take advantage of the opportunity the internet offers for collaboration, communication, and peer production, targeting vulnerabilities in the news media ecosystem to increase their visibility and audience. Even if these

subcultures are variegated, they generally present themselves as anti-establishment (Gerbaudo, 2014; Groshek & Koc-Michalska, 2017). They usually are against multiculturalism and globalism, and promote racist, anti-feminist, and anti-Semitic ideologies and have also developed techniques of "attention hacking" (Goerzen & Matthews, 2019) to increase their visibility through the strategic use of social media, memes, and bots. Alice Marwick and Rebecca Lewis (2017) use in their report the term "far-right" to characterize these subjects collectively, even if many of these groups refuse to identify themselves with the term and are completely disconnected by political visions and aims.

To understand the context where fake news born and proliferates, we must understand how new media manipulation works and how these groups pf people can create and spread disinformation without consequences. A merge of movements has coincided with the shaping contemporary new media landscape, where technology is seen as the hammer and society as the nail to break the status quo in a technological determinism vision (Star & Bowker, 2006). Those groups have always existed, waiting in the society's substructure for the right moment to emerge and reveal themselves without having to worry about personal consequences, because anonymity on the internet guarantees to those users the feeling of protection they need to expose their ideas, whatever they are (Davenport, 2002).

These are just some of the reason why to understand the context in which fake news are created, settled in, and diffused it is essential to do a preliminary examination of the relationship between internet subcultures and the new forms of narratives allowed and sponsored by new media organizations. What follows is an attempt to make order around the continuously reshaping pieces of this submerged network of individuals who are at the origin of the fake news phenomenon – namely: who are the subjects, what are their motivations, and where they operate in the online environment. This mapping can not be exhaustive by definition, because of the change rhythm that the ICT themselves allows. Also, the identified categories could sometimes look as they are overlapping themselves due to their similar and not defined ideologies, aims, representations, or their way of acting inside the online environment.

3.2 WHO IS MANIPULATING THE MEDIA AND WHAT MOTIVATES THEM? SUBJECTS, COMMUNITIES AND IDEOLOGIES

As we will see in the next chapters, stressing the importance of mainstream social media in the news manipulation process is fundamental to understand how fake news and alternative misleading news and ideologies can spread and became so easily part of collective narrations both at national and global level. For example, far-right groups have found a way to take advantage of the vulnerabilities of those powerful means of information to spread their messages, that in countries like Italy would be consider at least against common morality if not even against the Italian law. Nevertheless, who are they? What motivates them in the creation and spreading of fake news and misleading contents? Why do they use their tech abilities and influence skills above others to propagate hate, violence, conflicts and confusing information? In this section, we will try to make order considering the main sub-groups who are operating in the internet including the so called "alt-right" movement.

Other groups have their personal agendas, but what can undoubtedly pull them together are the tactics they use to spread their messages on the internet, as we will see more specifically in the next paragraph. Some of the actors who play in the media ecosystem are organized by their beliefs (like Conspiracies Activists), while others differentiate themselves by the choosing of a particular new media platform (such as individual bloggers or social media pages) but promote the same kind of ideologies. These are the main reason why the lines between these groups can sometimes appear to be blurry, although, if looked and analysed with a certain attention, it is possible to make distinctions between them. More precisely, we can make a quite good distinction between trolls, gamegaters, the alt-right, the manosphere, conspiracy theorist, influencers, hyper-partisan news outlets, and politicians. All of them take advantage of their sense of belonging and affinity to a specific online subculture and group to spread

disinformation, forged contents, scientific false belief or morally debatable contents, in a word: fake news.

Trolls can be divided in different categories, the ones that interest us the most are the one named as "anonymous trolls" (Bishop, 2014), since they are the more dangerous in the information society context. In literature, they have been described as those who deliberately baited people to elicit an emotional and moral panic response that provides both entertainment and interest to their audiences. Following Bishop (2014) words "English speaking countries across the world have quickly adopted the term [trolls] to better communicate ideas and concepts around forms of internet abuse and misuse". While classical trolls posted inflammatory messages to catch newbies in their arguments, manipulating the media also with the purpose of calling out hypocrisies and collective hysterias, new trolls have also learned how to target public figures and organizations to amplify their messages taking advantage of the mainstream media ecosystem. They are usually known as apolitical, and their use of shocking racist, cheeky irony, or sexist imagery is often recognized as an efficient and convenient tool to offend others.

Trolling can be perceived as a relatively innocuous practice made by bored young people, but it can also be transformed into a mean to spread more serious content that can lead to extreme behaviours. As well described in the literature, Classical trolling can be seen as people that create contents for the community's consensual entertainment, in order to build bonds between users. Instead, Anonymous trolling is often done at the expense of someone outside a recognised community for someone else sick enjoyment, whether it is a single person or an entire community, going to the detriment of a designated victim.

Trolling can also include "mischievous activities where the intent is not necessarily to cause distress", or it can seek to ruin the reputation of individuals and organizations revealing embarrassing personal information. So we can see how trolling has become an umbrella term that encompasses a wide variety of anti-social internet users (Bishop, 2014; Marwick & Lewis, 2017).

Trolls find their strength into the emotional effect they are able to emphasize in the reader, taking advantage of the level of importance that their targets

attribute to the information found on the internet, hoping to cause an indignant, angry, or tearful response to their posts. Recent developments in the evolution of the term also include celebrities who have latched on to the term 'troll' as being a negative type of internet user, creating a 'Lolz not trolls' campaign manifesting a difference between Lolz (that stand for 'laughing out loud' as something funny and entertaining that can potentially involve everyone) and trolls as people who abused others (Goerzen & Ma#hews, n.d.). It is also to be said that mass media organisations have for a long time demonised these "transgressive" characters, able to go against the rules, to increase their audiences. The way in which the word 'troll' has achieved the demon status as the symbol of someone people must be afraid of shows us the way in which the media manipulate and change the meanings of words for its own ends. Moreover, there is also the association of being a troll and being a (digital) teen. These young people, often seen as bored and purposeless individuals who are part of the new generation of digital natives, are pictured as the ones who enjoy to have control over media and its productions having the abilities to do it far more than oldest, more traditional and value-attached generations (Pumilia-Gnarini, 2013). In this case, youths are presented as the perpetrators of abuse against others, and as the main cause of a broken society. Nonetheless, they are also victims of abuse, and recognised as such by the same people who were actually the one to blame for the 'wreckage of society'.

Indeed, in such a complex situation, and with the prominent risk of losing control over a creature that media organisations had created, they also started to focus on the 'cyberbullying' of young people as a social problem worth of attention and the fact that celebrities and creators of social media are stopping their children from using mobile phones and the internet should give us a clue about how fast the fake news phenomenon can go out of control (Bennett & Livingston, 2018; Bishop, 2014; Star & Bowker, 2006).

The case of gamegaters instead is slightly different because they propose themselves as the carriers of a very specific lifestyle guided by an interiorised ideology. In the last decade, the community of self-identifying "gamers" organized itself around the consumption of video games and has been significantly

politicized. Although many male geeks (a word that connects the identification of nerds, gamers and socially excluded people) are privileged in terms of race and gender, the geek identity has always had a connotation of deep sadness and loneliness. If young people on the internet can even be proud of being called nerds and make fun of themselves (even if the term was created to define individuals who are generally considered as socially inadequate, shy, and smart, sometimes even *too* smart to choose to adapt themselves to the norms of a society made by too simple-minded people) they were also perceived as being too focused on academic endeavours, physically weak, uninteresting, unnecessary to society, and ultimately undesirable by their peers. In this scenario, being called a geek meant to be stigmatised as someone to be embarrassed to be around (Cross, 2005). They may even have been bullied or had a difficult time pursuing romantic relationships and are often unemployed even if very talented in handle ICT skills. Those young people whose had suffered from forms of social oppression by their peers in real life have found their niche and social sphere inside very closed online echo-chambers, were only people as skilled as them can enter. This is reflected in the way they can accept to be characterize also as NEETs (Not Engaged in Employment or Training) in their growing process, "betas" (non-alpha, weak, compromised, fragile, or pathetic) and incels (involuntary celibates) (Ging, 2019), victims of the society that encircle them. Anyway, with the passing of time and the growing of importance of ICT, the negative stereotype connected to the adjective "geek" has assumed also an alternative meaning. Today – also thanks to the American pop-culture – being a geeks means also being recognise as a carrier of an uncommon kind of technological savviness that many "common people" would want (Cross, 2005). Still, they are very resistant to discussions regarding white and male privileges and are bearer of a particular kind of masculinity that feels victimized and misunderstood by the mainstream society, and in particular by popular feminism. Even if their activity on the internet has not been damaging other people, they are essential to be considered since they have been able to developed online subcultural tactics and strategies, that can help us understand the subsequent emergence of the alt-right networked groups with their retrograde populism.

The term "alt-right" was coined by Richard Spencer in 2008 to describe right-wing political views at odds with the conservative establishment. The term "alt-right" is a neologism that combines some sleeper racist cells often manifesting also misogynist ideas. It can be convenient for us to use the term as a label for the various groups involved in far-right media manipulation, even if not everyone producing fake news on the internet can join the alt-right party.

Following the reconstruction of the genesis of the alt-right movement made by Forscher and Kteily (2019) the 2016 U.S. presidential election have been a crucial moment for the rise of the "alternative right" movement and to the enter of its narration in the social discourse. Nonetheless, with its rising in the celebrity scale groups on social media the far-right movement have also lost its internal organizational structure, leading to disparate portrayals of its members' psychology and making the process to analyse its participants' psychological profile and motivations harder to decipher. This difficulty is also due to the variance of their aims and scopes.

The term "alt-right," however, fulfilled several other goals. As a neologism, it allowed ideas long seen as unacceptable to mainstream media to seep into public discourse, expanding the range of what is politically acceptable (Marwick & Lewis, 2017). Following Lyons words, the Alt Right - short for "alternative right," - is a poorly organized far-right movement whose people "shares a contempt for both liberal multiculturalism and mainstream conservatism; a belief that some people are inherently superior to others; a strong internet presence and embrace of specific elements of online culture; and a self-presentation as being new, hip, and irreverent" (Lyons, 2017). White supremacist and white nationalist groups have long used the web in the hopes of recruiting new members and increase their visibility and give max-exposure to their ideas. They can use irony, in-jokes, and extreme speech to provoke anger in others. The problem is that attempting to determine which of these people are "serious" and which are "ironic" is impossible. As Marwick and Lewis say, "even among those who do seem ideologically committed […] the group is diverse in its beliefs and marked by constant infighting and squabbling" (Marwick & Lewis, 2017). Their ambiguity is, itself, a strategy; it allows participants to dissociate themselves with particularly unappetizing

elements while still promoting the overall movement. The cult of tradition surfaces in some fringe movements associated with the alt-right that advocate a return to an imaginary golden past where men were "Men", immigration was limited, and so forth.

The manosphere on the other hand, present itself as an ensemble of micro-blogs, forums, and websites dedicated to the discussion of masculinity. Men's Rights Activists form its most significant subculture-group. However, it also includes anti-feminists, misogynist, and the previously mentioned "incels" (involuntary celibates), and men who believe male domination is natural (Ging, 2019). While different aspects are part of the subculture of the members of the manosphere, one thing that they all have in common is the concept of women as fickle and opportunistic creatures, whose ends are to seduce "high status" men and exploit them for their money. They also perceive women holding power positions in society as emasculating (Lyons, 2017; Messner, 1998).

As Lyons (2017) reported in his article, "one of the events that brought the manosphere to public attention was the Gamergate controversy. Starting in 2014, a number of women who worked in the video game industry were subjected to large-scale campaigns of harassment, coordinated partly with the #Gamergate Twitter hashtag. […] it included streams of misogynistic abuse, rape and death threats, as well as doxxing (public releases of personal information), which caused several women to leave their homes out of fear for their physical safety".

These groups of people spoke to public paranoia (Allievi, 2014) mentioning the changes around "whiteness" as a social category and "white male selfhood as a fragile and besieged identity" (Kennedy, 1996), blaming women and people of color for it, other than for their replacement in the labour market. They attempt to prove the validity of their thesis diffusing frameworks and narratives, which promote their cause and attract new members. These narratives focus mainly on the idea that men are victimized by feminists, and that misinformation, political correctness, and liberal politics are the tools used to hide the truth from the general public (Farrell et al., 2019).

Without the barrier of gatekeepers, internet platforms have also become ground for the flourishing of groups dedicated to the diffusion of conspiracy

theories. On forums like 4chan, 8chan, and Reddit (which are very popular in America), users can dissert in real-time about theories that align with their worldviews (Wood, Douglas, & Sutton, 2012). These groups transform themselves very fast into echo chambers of like-minded people (Isenberg, 1986; Sunstein, 2000).

If some theories have an ideological origin (e.g., anti-Semitism), others express distrust towards the "official stories" sold by the media. They usually believe in the machinations of a powerful group of people (whose subjects can vary). Conspiracies theories have always existed, and they still share and express anxieties concerning the loss of control about religion, political, or social order. In the case of the far-right, conspiracist's topics can include: the loss of white primacy, Islamophobia, fear of immigration, fear of the emasculation of men, transphobia and homophobia, fears of a vast Jewish conspiracy controlling the media; fears of losing control of crucial civic and educational institutions; fear of erosion of morality and traditional values (Dagnall et al., 2015; Lyons, 2017; Van Valkenburgh, 2018).

Scholars have identified different factors that can contribute to the growth of conspiracy theories, and their researches have demonstrated that conspiracies theories can spread thanks to fake information flows within closed communities. So, when people are exposed only to false information or conspiracy theories, they will be more likely to believe in them and expose themselves and the whole society to tangible adverse effects (e.g., anti-global warming theories, anti-vaccine theories, etc.) (Sunstein & Vermeule, 2009).

The current media environment and the loss of the 24h news cycle are indeed amplifying such effects. Mainstream media economy is, in fact, suffering from fast development, as for the massive spread out of new media also used by a vast amount of people to get information (Shen, Ahern & Baker, 2014). So, as online communities are increasingly turning into conspiracy-driven news sources, their sensationalist claims are often used also by journalists that have no more time to cover the function of being the gatekeeper's information if they want to stay up-to-date. Unfortunately, this also has the countereffect that sometimes they help

in the spreading of fake news found inside those internet echo chambers by exposing their ideas to an even more broad public.

Inside all these internet sub-cultures and groups there are some individuals who are officially recognised as mouthpiece, or as they are called today, Influencers (Uzunoğlu & Misci Kip, 2014). They are a set composed of online trolls, gamers, ideologues, and conspiracy theorists that hold an incredible amount of influence among the other online actors and play a distinct role in media manipulation efforts. They are usually significant nodes of their network and have the power to amplify messages and get them a mainstream coverage. They have differentiated themselves from the other people belonging to their online niches thanks to their ability to apply theoretical knowledge about technological platforms or attention hacking tactics (Boyd, 2017b), and use it to gain notoriety and increased the coverage of their belief.

Benkler et al. (2017) describe their online activities as "combining decontextualized truths, repeated falsehoods, and leaps of logic to create a fundamentally misleading view of the world." This may not correspond to the creation of a fake news per se, but it is certainly a propaganda strategy which is rooted in an ideologically-driven worldview (Jack, 2017).

Politicians are undoubtedly the strongest influencers that exist when it comes to the diffusion of news. They functioned as amplifiers of corrupted hyper-partisan news and convictions because they are always considered newsworthy by mainstream media, which are considered trustworthy by the majority of people. They could elevate a conspiracy theory from the status of fringe speculation to the headlines of network news just by making an affirmation during their politics campaign. Furthermore, even if journalists were reporting on it in shock or disgust, that message or idea will still reach millions of viewers and readers that would have never cross their path with it (Stets & Turner, 2006).

Now that we have dealt with the different actors who are employed in manipulating media, we can start indagate what motivates them.

Since "media manipulation" covers a vast range of practices, there are also very different motivations behind them. On the one hand, we have people that make circulate content to push their worldview, often using new media as social

networks to increase their audience. This could be the case of conspirationists, alt-right members, or even politicians. On the other, some people create and spread "fake news" to make money (like click-baiters), or to express their sadistic traits as trolls who create chaos on the web just for their fun (Buckels, Trapnell, & Paulhus, 2014), and groups who use it with the specific aim to affect public opinion, like the Alt-right exponents.

However, people who create and spread disinformation, propaganda, and fake news are usually motivated by a combination of one or more of these factors: ideology, money, status, and attention (Boczkowski & Papacharissi, 2018). On social media, users often share content they believe will both appeal to their audience and be consistent with their desired self-presentation before even checking about the content of the whole message (Lee & Ma, 2012). Ideologies could be another great motivator to induce people to group together and share thoughts, feelings, and often unspeakable emotions even when there are differences into the group thinking. They simply function as aggregators for people in search of identity (Feixa, Leccardi, & Nilan, 2016).

If we take the Alt-Right groups as example we can easily discover how some of the traits they shared are really strong and potent identifier symbols, like the idealisation of old and traditional values; a strong dislike for multiculturalism and immigration; a strong resentment towards nonbinary gender identities; an even stronger belief in profound differences between people of different races; the idea that "political correctness" is like censorship; a total embeddedness in internet culture, a serious lack of social skills; the strong belief in nationalists policies, and a compulsive tendency to construct and spread conspiracy theories (Lyons, 2017).

From this perspective, using the Internet to spread far-right ideology is an attempt to work from the bottom to establish counter-narratives in which people that perceive themselves as oppressed minority can present themselves as heroic groups of people who are struggling against the domineering status quo (Clarson, 2019).

Another even more dangerous motivation is radicalization. Movements are moved by it and take advantage of young men's rebellion and dislike of global

society to spread their ideas – whatever they can be – using both irony and their in-depth knowledge of the internet culture. This form of radicalization happens through social media, targeting primarily young people immersed in internet culture (Grattan, 2008).

On the other hand, another great example of manipulation of the tools made available by the Information society is the manosphere idea to use the term "red pill" to refer to its radicalization method. Taking it from the popular sci-fi movie "Matrix.", where Morpheus asks the protagonist to choose between a red pill and a blue pill. With the red pill, the secrets of the Matrix will be revealed; but with the blue one, nothing will happen, and he will be free to go back to his everyday life. For them, being red-pilled means reject liberal ideology and accept the idea that men are the real oppressed class. For the alt-right instead, it means being aware of the lies hidden behind multiculturalism and globalism ideologies and accept that the only possibility for renewed society is ethnonationalism (Van Valkenburgh, 2018).

Red-pilling has become the far-right equivalent to consciousness-raising or becoming "woke," as they call themselves, while "normies" have become a derisive term used for people who stay hold to their centrists and less extreme ideas (Nagle, 2017).

However, why is radicalization possible? Many users post about their feeling, declaring how much they are unable to relate to the mainstream culture, showing a tragic sense of anomie. Anomie, as Emile Durkheim theorized, is the consequence of a fast social change. It is caused by a profound mismatch between what society claims individuals can achieve and what they can achieve. The results of this gap are the weakening of group ties, the lack of adhesion to social norms, and the fragmentation of identity, which usually leads to a sense of purposelessness (Durkheim, 1897; Smith & Bohm, 2008).

Finally, money is surely another motivation that drives people in the construction of fake news business and, consequently, in the manipulation of mainstream media. In the case of the building of "fake news" market, it can be easily seen how they leveraged narratives may appear to be ideologically driven, while they are constructed by people with no ideological agenda. Such kind of

content is produced and spread by people seeking money without being seen or noticed by the system. There are also cases where individuals use media provocation trying to gain explicitly a level of fame or influence that will guarantee them the earning of money. Whether or not such hoax stories are ultimately revealed to have had a persuasive impact, they raise important normative questions about the underlying media infrastructures and industries — e.g., tech firms, programmatic advertising exchanges, etc. — that apparently create a lucrative incentive structure for "fake news" publishers (Braun & Eklund, 2019).

Following this last group of people, we can understand how even the research and the gaining of status and acceptance within online communities could be an excellent motivation for users to manipulate mainstream media. On social media, status is generated through likes, shares, and comments, so users are incentivized to create content that will resonate with their friends, followers, and groups (Bernstein et al., 2013). These communities believe that by manipulating media, they will gain higher status, and with it, the necessary level of control over powerful global institutions, which many of them distrust and dislike.

4 FAKE NEWS

4.1 WHERE CAN WE FIND FAKE NEWS AND WHO IS STUDYING IT

In the early 2000s, the growth of online news prompted a new set of concerns. The World Economic Forum, in its 2013 report (Howell, 2013), has listed the ''massive digital misinformation'' as one of the main risks for the modern society. People perceptions, knowledge, beliefs, and opinions about the world get (in)formed and shaped through the information they can access. The World Wide Web, and in particular social media platforms, with their high level of accessibility, have changed the way we can get access to information and pursue intellectual growth.

Problem is that false information is particularly pervasive on social media, above all when it has the potentiality to foster collective credulity. There is a multitude of mechanisms that can give birth to the flow and acceptance of false rumors, which in turn create false beliefs that can rarely be corrected once adopted by an individual as true. The process of acceptance of a claim may be driven by social influence or by the individual system of beliefs. That is also why usually information-based community are formed around shared narratives. It is this way of sharing visions and opinions among strict lines of communities which create their own narratives that contribute to the emergence of political rumors and alternative information sources, often with the aim to organize and convey the public (Mocanu, Rossi, Zhang, Karsai, & Quattrociocchi, 2015a).

It is commonly recognised that the medium of the internet (and social media, in particular) has been the perfect tool for fostering the process of creation and proliferation of fake news. This is the reason why 'fake news' has sometimes been defined as "the online publication" of false statements of fact (Klein & Wueller, 2017). Yet, fake news is not itself a new phenomenon, but when combined with online social media that enable audience-specific manipulation of cognitive biases and heuristics, it forms a potent mix (Gelfert, 2018; Khaldarova & Pantti, 2016).

The World Wide Web has undoubtedly changed the dynamics of information. Relevance of facts, in particular when connected to social issues, are often combined with half-truths and untruths to create informational mixtures that users discover and share with their on-line friends. The information then enters inside a process of cascades of reshares which can comprise modification and that at the end might reach a large number of people. Analysis have showed also how users tend to aggregate around certain contents, giving birth to well defined groups with equals information consumption patterns (Bessi, Coletto, et al., 2015).

The World Wide Web has also given the possibility to create a direct path from producers to consumers of content, allowing disintermediation, and changing the way users search for information, debate between groups, and form their opinions (Brown, Broderick, & Lee, 2007; Kahn & Kellner, 2004; Kumar, Mahdian, & McGlohon, 2010; Quattrociocchi, Caldarelli, & Scala, 2015; Quattrociocchi, Conte, & Lodi, 2011). This disintermediated environment can foster confusion and thus encourage speculation, rumors, and mistrust in official media (Del Vicario et al., 2016).

As the 2018 report for the EU Commission states: we keep moving towards and inside an always more digitalised environment, and it is undoubtfully clear that the same technologies and platforms can both enable and contribute to the creation and dissemination of entirely legitimate information as well as enable activities that allow various forms of potentially harmful disinformation. The challenge today is to find ways to increasing societies' resilience to the threats of disinformation while maintaining an open environment that can facilitate the circulation of ideas and information and find a way to combat the fake news

phenomenon without undermining the ways in which digital media are empowering citizens, societies, and economies (Gabriel & de Cock Buning, 2018).

4.2 ANALYSING THE LABEL

ERIC, Scopus, Google Scholar, ScienceDirect, and Mendeley were explored using the following search terms and keywords: "fake news"; "fake news & education"; "fake news" & "training"; "fake news" & "critical thinking"; "fake news" & "alternative reality"; "fake news" & "social media"; "fake news" & "new media".

The search covered literature from January 2013 up to and including December 2018. Some older publications were also included, when considered particularly important or interesting for the debate to come. These were mainly found by means of snowballing (Cordingley, Bell, Thomason, & Firth, 2005; Petticrew & Roberts, 2006), that is, literature cited in the already included articles. At the end of the literature research process 153 articles were retrieved and selected for in-depth reading and examination.

The first selection process encompassed three steps. In the first step, the title and abstract, were judged based on the following criteria for inclusion: (a) the article or the paper had to be peer reviewed, (b) fake news had to be the main topic of the article (c) the article had to report a discussion about fake news in the new media scenario or hypothesis about why fake news can be accepted as true even when the content is clearly false.

In the second phase, the selected articles' research questions, method, results, and conclusions were analysed, reading the full text for a deeper evaluation of its utility for our aims: making an overall description of fake news' definition in different fields of knowledge and opening a debate about how they could interrelate with education and educational policies.

In total eight fields of study that have been interested in the investigation on fake news were identified.

Journalism and media are surely the most prolific, being directly affected by the diffusion of Fake News awareness and concerns. Most of the articles focus on the ethical aspect of the journalistic work and the impact of the new platforms and media channels.

ICT science is mainly concerned with the identification of useful algorithms for automatic detection of fake news, while cognitive psychologists are working on the assessment of the role played by cognitive biases, often adopting an experimental approach.

Economics articles focus on how fake news can affect the economy by leading large numbers of people to buy specific products, but also by diffusing false narratives that affects their behaviours and decisions. The same mechanism is also reported in studies conducted in the sociological and political fields, where attention is mainly pointed towards the consequences the massive diffusion of fake news through social media can have: people choices change the world in which we are living.

This is also the reason why in legal and medical fields researchers are asking themselves how the fake news phenomenon could be controlled from a legal perspective, but also with the diffusion of correct information.

Data-analysis

To perform the data-analysis we used a qualitative model of content analysis (Krippendorf, 2004). Content analysis involves the description and analysis of text to represent its content. We chose the qualitative version for the assessment of the words and terms used in the different articles. Content analysis differs from hermeneutics, in that its focus is based solely on the description of the contents of the text: "*Content analysis establishes 'meaning' only in the sense of what is explicit in the words used in the text*" (Miller & Brewer, 2011, pp.44).

The data-analysis consisted of five steps:

1. First, a list of all fields of knowledge present in the sample of articles was created. This list was then clustered into five categories. The five categories identified were: Journalism and Media Studies, Cognitive

Psychology, ICT Sciences, Philosophy, Sociological and Political Sciences. Each article was assigned to a field of knowledge. These identifications were used to determine the primary research and/or field from which each article originated. When one article appeared to hold more than one perspective it was assigned to more than one field of knowledge.

2. All the selected articles were then examined. This examination analysed (a) what definition of fake news was proposed and used as a base for the developing of the article, (b) whether, and by what method, they investigated detection methods, (c) whether and how they analysed the phenomenon in relation to the reason why fake news is different from simple misinformation (d) whether and how they have the potential to engage with public opinion and modify or radicalise it (e) whether and how they confronted the fake news problem within an educational context or in relation to educational policies.

3. The next step was the creation of a model containing the main characteristics provided by the fake news definitions taken from each article, with consideration also of the different detection method proposed.

4. Models were then critically analysed and compared in order to highlight common traits and specificities, as well as strong points and weaknesses.

5. Finally, where and if present, information on the relation between fake news and education was analysed, compared, and used to inform the final discussion.

One of the main features that characterise the post-truth era is certainly the rise of fake news as a main phenomenon of this time. But how can we define fake news? To have a better view on the topic it is necessary to focused on the definitions adopted by researchers and experts, to identify all relevant aspects underlined in academic literature. Eight commonly shared categories used to define and recognise fake news can be selected[2]. They are: 1) Intention of

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[2] See Table 1.

deception; 2) Diffusion via social media; 3) Fabrication: the news is fabricated, ad hoc; 4) Manipulation: the content aims to manipulate the audience, mainly on political or scientific topics; 5) Level of facticity; 6) Political propaganda; 7) Satire/parody: content modified for satirical/parody is perceived as real; 8) appearance.

Fake news characteristic	Number of articles including it
Intention of deception	Articles Wardle, 2017; Grech, 2017; Tandoc, Lim, and Ling, 2017; Lazer et al, 2018, Lazer et al, 2017; Flood, 2016; Pearson, 2017; Victoria, Rubin & Conroy, 2015; Rubin, Chen, & Conroy, 2015; Corner, 2017; Allcott & Gentzkow, 2017
Diffusion via social media	Articles Bakir & McStay, 2017; Flood, 2016; Hunt, 2017; Pearson, 2017; Joselit, 2017
Fabrication: the news is fabricated, ad hoc	Articles Grech, 2017; Tandoc, Lim, and Ling, 2017; Lazer et al, 2018; Flood, 2016; Pearson, 2017; Victoria, Rubin & Conroy, 2015; Rubin, Chen, & Conroy, 2015; Corner, 2017; Joselit, 2017; Allcott & Gentzkow, 2017
Manipulation: the content aims to manipulate the audience, mainly on political or scientific topics	Articles Bakir & McStay, 2017; Grech, 2017; Tandoc, Lim, and Ling, 2017; Flood, 2016; Pearson, 2017; Corner, 2017; Joselit, 2017
Level of facticity	Articles

	Vosoughi, Roy, & Aral, 2018; Grech, 2017; Allcott & Gentzkow, 2017
Propaganda	Articles Wardle, 2017; Tandoc, Lim, and Ling, 2017; Flood, 2016; Pearson, 2017
Satire/parody: content modified for satirical /parody is perceived as real	Articles Grech, 2017; Tandoc, Lim, and Ling, 2017; Victoria, Rubin & Conroy, 2015; Rubin, Chen, & Conroy, 2015
Appearance	Articles Lazer et al, 2018; Tandoc, Lim, and Ling, 2017; Victoria, Rubin & Conroy, 2015; Rubin, Chen, & Conroy, 2015; Joselit, 2017

Despite becoming one of the most popular and used word in the past few years, the concept of "*fake news*" is hard to define. In the literature we can find different definitions, from authors who consider "*satirical tv shows*" as a form of fake news, to the ones that accept fake news to be only false claims created to generate web traffic towards a specific and often fraudulent website (click-baits). Other authors give an intellectual and more philosophical frame to the phenomenon, linking it to concepts as "*post-truth era*", "*post-fact*", "*alternative facts*" or "*subjective reality*". Finally, there are authors trying to study fake news from a psychological (mostly cognitive) point of view. More than seeking only a definition, these authors are usually in search of the reasons that make fake news such an important, influential, and highly diffused phenomenon.

Some researchers claims that "…the term fake news has lost all connection to the actual veracity of the information presented, rendering it meaningless for use in academic classification" (Vosoughi, Roy, & Aral, 2018b). Then when speaking about news they chose to use what they considered more objectively verifiable

terms as "true" or "false". This choice though obliges them to ignore the fact that in "false" news there can be an element of willful distortion of the truth which always imply a certain level of intentionality and a defined (often even openly declared) strategic aim.

In other authors' analysis, the element of intentionality can be seen already in the construction of the definition of fake news, even when it is not openly declared. For instance, one of the most complete definitions of fake news we could find is from Grech (2017) work. He categorised fake news under seven possible layers: 1. Satire or parody, which has no actual intention to harm but has the potential to deceive and confuse; 2. False connection, when headlines or visuals of captions fail to support the real content of the message; 3. Misleading content, when there is a cynical and possibly hypocritical use of information to frame an issue or an individual; 4. False content, when a genuine content is shared with false contextual information; 5. Imposter content, when genuine sources are impersonated with false, made-up sources; 6. Manipulated content, when the news is actually true, but is presented in a highly partisan way; 7. Fabricated content, which include mostly outright false information (Grech, 2017).

A similar way to identify different typologies of fake news is presented in Tandoc, Lim, and Ling, (2017), who categorise fake news as: "*news satire, news parody, fabrication, manipulation, advertising, and propaganda*". Here, in the "fabrication" and "manipulation" fake news subcategory, the intention to deceive starts to be highly visible. They are also particularly attentive to the way fake news looks: "*fake news appropriates the look and feel of real news; from how websites look; to how articles are written; to how photos include attributions. Fake news hides under a veneer of legitimacy as it takes on some form of credibility by trying to appear like real news*" (Tandoc, Lim, et al., 2017).

Appearance is a key factor in fake news because it helps in the deceiving process of the reader. As a matter of fact, it is underlined also by Lazer et al. (2018), when they define fake news as "fabricated information that mimics news media content in form but not in organizational process or intent". In their vision, one of the main features that distinguishes fake news from "*real*" news in their construction process, is the ethical commitment to which the production and

diffusion of "*real*" news by professional journalists are bound. In fact, they state that fake news "*lack[s] the news media editorial norms and processes for ensuring the accuracy and credibility of information*" (Lazer et al., 2017). The same authors claim that fake news, understood as a category, often overlaps with "*other information disorders, such as misinformation (false or misleading information) and disinformation (false information that is purposely spread to deceive people)*" (Lazer et al., 2018). Reading this definition, we can see how much the "*intentionality of deceive*" is important to discriminate fake news from other form of news manipulation, like satire or parody, which usually has an intention to amuse whilst nevertheless raising people's consciousness of an issue – but lacks the intent to direct behaviour and has no intent of deceive them.

Other definitions of fake news can be found in the 'Word of the Year' 2016 selections – done by the editors of the Macquarie and Oxford dictionaries (Flood, 2016) – fake news is described as: "*Disinformation and hoaxes published on websites for political purposes or to drive web traffic*". In another article it is also underlined and stressed that "*The incorrect information (has) being passed along by social media*" (Hunt, 2017). Both these features had been chosen by Pearson (2017) as critical parts of fake news' definition, introducing and analysing also the aspect of "hoax" as a possible distinctive trait of fake news, and the fact that they are, above all communication channels, spread on the internet using blogs and social media.

With regard to "hoax" and its relationship with fake news, Victoria, Rubin & Conroy (2015) describe how deceptive news can be harvested, crowdsourced, or mimicked by people. They analyse three different types of fake news, suggesting that there are at least three distinct characteristics that can connotate fake news: fabrication, hoaxing, and satire (Rubin, Chen, & Conroy, 2015). Again, we see how fake news can be considered as a "*snappy identifier of a kind of a fraudulent media product*" (Corner, 2017).

The use of fake news for political purposes is harder to delineate, due to the frequently improper use of the term "*fake news*" often made by politicians. This leads to the opening of two sets of questions: the first is linked to the degree of prevalence of the concept of "false" within the news ecology, while the second

concerns the use of the term made by governments to denounce news and rumours which conflict with their own public image or partisanships (Corner, 2017). The misuse and abuse of the term is seen to be founded in power: "*anything can now be called fake news, as long as the accuser possesses the power* (i.e., the platform) *to publicize his or her claims*" (Joselit, 2017). Read from a philosophical and phenomenological point of view, we could add that "*all news is fake news from someone's point of view, and as a corollary, any conceptual category —such as fake news itself— may be unmoored from its anchoring signification and begin "trending" as a polysemous slogan*" (Joselit, 2017). Others more simply conceptualize fake news as distorted signals uncorrelated with the truth, and define fake news as news articles that are intentionally and verifiably false, but could mislead readers (Allcott & Gentzkow, 2017).

4.3 THE SPREAD OF FAKE NEWS: THREE MAIN FACTORS

Another focus of the articles analysed was the identification of the factors related to the spread of fake news. The role of social media has already been highlighted by its recurrence in the analysis of the definitions and it plays a relevant role also in the identification of the specific ways fake news can spread rapidly among networks (typically but not exclusively virtual). The reviewed papers focus on phenomena that impact on the facilitation and diffusion of fake news, and discuss the role played by these different factors.

Social Media role	Articles
	Howel, 2013; Ledbetter et al., 2011; Kim & Lee, 2011; Ling and Lai, 2016; Lee & Ma, 2012; Antunovic, Parsons, & Cooke, 2018; Singer, Domingo, Heinonen, Quandt, & Vujnovic, 2011; Bennett, 2012; Sunstein,

	2018; Tandoc, Ling, et al., 2017; Klein & Wueller, 2017; Gelfert, 2018; Khaldarova & Pantti, 2016; Sundar, 2016; Allcott & Gentzkow, 2017; Bessi, Coletto, et al., 2015; Brown, Broderick, & Lee, 2007; Kahn & Kellner, 2004; Kumar, Mahdian, & McGlohon, 2010; Quattrociocchi, Caldarelli, & Scala, 2015; Quattrociocchi, Conte, & Lodi, 2011; Del Vicario et al., 2016; Gabriel & de Cock Buning, 2018;
Emotional engagement role	Articles Bakshy, Messing, and Adamic, 2015; Allcott & Gentzkow, 2017; De Keersmaecker ∗ & Roets, 2017; Mocanu, Rossi, Zhang, Karsai, & Quattrociocchi, 2015; Kapferer, 2013; Vosoughi et al., 2018; Fine, 2007; Polletta & Callahan, 2017; Potthast et al, 2017; Dahlberg, 2007; Joselit, 2017; Tandoc, Ling, et al., 2017; Pariser, 2011; C. Sunstein, 2001;
Role of the Audience	Articles Tandoc, Lim, et al., 2017; Coddington & Holton, 2014; Jang & Park, 2017; Chen, Conroy, & Rubin, 2015; Schifferesa et al., 2014; Lin, Spence, & Lachlan, 2016; Joselit, 2017; Bessi, Coletto, et al., 2015; Mocanu et al., 2015; Gabriel & de Cock Buning, 2018; Bessi, Coletto, et al., 2015; Bessi, Scala, Rossi, Zhang, & Quattrociocchi, 2014; Mocanu et al., 2015; Aiello et al., 2012; Bessi, Petroni, et al., 2015; Bessi, Zollo, et al., 2015; Zollo et al., 2015; Del Vicario et al., 2016; Lazer et al., 2017; Lazer et al., 2018; Reedy, Wells, & Gastil, 2014; Fowler & Margolis, 2014; Tafuri et al., 2014;

4.4 SOCIAL MEDIA ROLE

In the early 2000s, the growth of online news prompted a new set of concerns. The World Economic Forum, in its 2013 report (Howell, 2013), has listed ''*massive digital misinformation*'' as one of the main risks for the modern society. People perceptions, knowledge, beliefs, and opinions about the world get (in)formed and shaped through the information they can access. The World Wide Web, and in particular social media platforms, with their high level of accessibility, have changed the way we access information and pursue intellectual growth. Social media has become deeply embedded in our daily life.

The various forms of social media facilitate our interpersonal relationships (Ledbetter et al., 2011), affect our personal well-being (JI Kim & Lee, 2011), facilitate social coordination (Ling and Lai, 2016), and shape the way people approach news (Lee & Ma, 2012). Furthermore, on these platforms people come across news and stories often by accident, just because they are using them (Antunovic, Parsons, & Cooke, 2018). Social media has allowed the audience to evolve: nowadays people can publish what they witness, comment on every news item, and share articles with their networks (Singer, Domingo, Heinonen, Quandt, & Vujnovic, 2011). Social media has also increased people's ability to customize information to their personal interests (Bennett, 2012). These changes, linked to the use of social media in our daily life, have important implications. As Sunstein (2018) has warned, constant exposure to one set of views is likely to lead toward errors of judgment and confusion. By accessing only news conforming to their own perspectives, or the perspectives of their social sphere, audiences risk losing the ability to engage in meaningful debates. The shift toward news disseminated among social networks redefines role and authority of information producers and consumers (Tandoc, Ling, et al., 2017).

It is commonly recognised that the medium of the internet (and social media, in particular) has been the perfect tool for fostering the process of creation and proliferation of fake news. This is the reason why "*fake news*" has sometimes been defined as "*the online publication*" of false statements of fact (Klein &

Wueller, 2017). Fake news is not a new phenomenon in itself, but forms a potent mix when combined with online social media that enable audience-specific manipulation of cognitive biases and heuristics (Gelfert, 2018; Khaldarova & Pantti, 2016). Social media platforms allow people to produce and share stories easily, taking information from diverse sources, with negligible costs, with the possibility of reaching vast numbers of people. Furthermore, the fact that on social media platforms there are still no third-party filtering, fact-checking, or editorial judgment is one of the main reasons why social media platforms appear to be especially conducive to fake news; and is also considered to be a key reason that people believe so easily in fake news (Sundar, 2016). Finally, there is the format in which news is shared on social media platforms — slices of information, mostly composed only of a captivating title and an image, made to be consumed fast. Within a supporting context, this can make it almost impossible for the individual to judge an article's veracity (Allcott & Gentzkow, 2017).

The internet has undoubtedly changed the dynamics of information. Relevance of facts, in particular when connected to social issues, are often combined with half-truths and untruths to create informational mixtures that users discover and share with their online network. The information then enters a process of cascading reshares, which can comprise modification, and that at the end might reach a large number of people. Analysis have showed also how users tend to aggregate around certain contents, giving birth to well defined groups with similar information consumption patterns (Bessi, Coletto, et al., 2015). The internet has also created direct paths from producers to consumers of content. This has changed the way users search for information, debate between groups, and form their opinions (Brown et al., 2007; Kahn & Kellner, 2004; Kumar et al., 2010; Quattrociocchi et al., 2015, 2011). This disintermediated environment can foster confusion and thus encourage speculation, rumors, and mistrust in official media (Del Vicario et al., 2016).

A 2018 report for the EU Commission states that we keep moving towards and inside an always more digitalised environment, and it is undoubtedly clear that the same technologies and platforms can both enable and contribute to the creation and dissemination of entirely legitimate information, as well as allow

various forms of potentially harmful disinformation to be propagated. The challenge today is to find ways to increasing societies' resilience to the threats of disinformation while maintaining an open environment that can facilitate the circulation of ideas and information and find a way to combat the fake news phenomenon without undermining the ways in which digital media are empowering citizens, societies, and economies (Gabriel & de Cock Buning, 2018).

4.5 EMOTIONAL ENGAGEMENT ROLE

Narrators often use the personal pronouns ''we'' or ''you'' when they write. In this way, a personal story becomes collective, and the we pronoun is used even when the narrator didn't actually live the experience. This suggests that the deep story may have been lodged not in directly lived experience, but in the shared stories of the group. Sharing stories helps to constitute the group, reinforcing its values and demarcating its boundaries. Narration also reinforces collective and partisan identities. Bakshy, Messing, and Adamic (2015) show how social network platforms provide the opportunity for ideologically segregated groups to find a place where they can share a coherent content. We already said that people are far more likely to read and share news articles that are aligned with their ideological positions. This may suggests that people who get news primarily from social media are less likely to receive evidence about the true state of the world that would counter an ideologically aligned but false story (Allcott & Gentzkow, 2017).

There are a multitude of mechanisms that can facilitate the flow and acceptance of incorrect and untrue information, which in turn can create false beliefs: beliefs that can rarely be corrected once adopted by an individual as true (De Keersmaecker* & Roets, 2017). The process of acceptance of any claim to truth may be driven by social influence or by the individual system of beliefs. That is why information-based communities are formed around shared narratives. It is

this way of sharing visions and opinions among relatively closed communities, creating their own narratives, that contribute to the emergence of political rumours and alternative information sources, often with the aim to organize and influence the public (Mocanu, Rossi, Zhang, Karsai, & Quattrociocchi, 2015b).

Another pull derives from the pleasure that comes from reading and sharing news that are catching the public attention. Jean-Noel Kapferer (2013), an expert in the literature on rumours, argues that "*rumors are a kind of conversational capital*". To make a clear distinction, Vosoughi and colleagues define news as any story or claim with an assertion in it and rumors as the social phenomena of a news story or claim spreading or diffusing through the social media network. That is, rumors are inherently social and involve the sharing of claims between people. News, on the other hand, is an assertion with claims, whether it is shared or not (Vosoughi et al., 2018b). The person sharing the rumour "*provides information that is scarce, exciting, and moving*" (Kapferer, 2013). In return, the sharer gains the pleasure of pleasing others and has the sensation of being listened to. It does not even matter if the rumours are true or not. Or as Gary Alan Fine (2007) says it, rumours are "*too good to be false*". Sharing rumours also produces a feeling of solidarity inside the group. Above all, as Fine (2007) underlines, if the rumours reflect a distrust towards social institutions, it creates a sense of trust in the rumour-sharer (Fine, 2007). When this dynamic is activated, sharers do not think they have to assess the validity of the story and this is another way to signal how much a person feels his commitment to the group. The use value of the story in reinforcing a specific identity is more important than the true value of the story (Polletta & Callahan, 2017).

Following Potthast et al (2017), we can say that in social media a certain kind of "news" spreads much more successfully than others, and that this 'news' is "*typically extremely one-sided (hyper partisan), inflammatory, emotional, and often riddled with untruths*". They also notice how "*fake news are hardly ever devoid of truth. More often, true facts are misconstrued using argumentative fallacies to influence a person's opinion*" (Potthast et al., 2017). This observation seems particularly important when we think about social media, where information is exchanged, leading to a constant and hyper-fast negotiation of

meanings. This extremely rapid exchange of large volumes of information adds an important layer to the construction and spread of fake news, since the power of the content lies also in how well it can penetrate different social spheres (Dahlberg, 2007). As we have just seen, social spheres are commonly strengthened by information and narrations exchange; therefore, the quality of information becomes secondary. Authors even say that "*social media is the lifeblood of fake news*" (Tandoc, Lim, et al., 2017) because these platforms are far more efficient and affordable than traditional media (Joselit, 2017; Tandoc, Ling, et al., 2017). Allcott & Gentzkow (2017), identified that the shear diversity of viewpoints on news available to people makes it easier for like-minded citizens to form "*echo chambers*" or "*filter bubbles*" (Pariser, 2011; C. Sunstein, 2001).

4.6 THE AUDIENCE ROLE

The role of the audience is a fundamental factor in defining fake news, especially if we ask ourselves whether fake news remains fake if it is not perceived as such. While news is constructed by journalists, the more common perception is that "*fake news are co-constructed by the audience*" (Tandoc, Lim, et al., 2017) in the continuous process of sharing and evolving strictly as the fact itself evolves. Also, the dependence on non-credible online sources supports the idea that there has been a change in the patterns of individuals' news consumption, devolving the traditional role of journalists as gatekeepers (Coddington & Holton, 2014; Jang & Kim, 2018) to an audience made of non-expert individuals. In fact, websites where fake news is published are generally run by "*amateurs, hobbyists, and advertisers whose reporting can often be highly opinionated, sensationalized, misinformed, misleading, unverified, or otherwise unreliable*" (Chen, Conroy, & Rubin, 2015).

The audience of online news seems to be characterized by a specific attitude to the articles they read: "social media users appear to have lost the notion of

deep reading by adopting a posture of deep monitoring and, when they see a catchy headline the default is to share" (Schifferesa et al., 2014). Plus, as users bypass traditional media gatekeepers to confront themselves directly with primary information, the gatekeeping function automatically shifts from content producers to content consumers (Lin et al., 2016).

This is possible in large part because people now accumulate rather than critically judge information; "*we function more as profiles than as citizens*" (Joselit, 2017).

The spread of misinformation online is particularly difficult to detect, and even more to correct, because of the social reinforcement it received by peers who are sharing the same beliefs. The growth of knowledge, fostered by an interconnected world, together with the unprecedented acceleration of scientific progress, has exposed society to an increasing level of complexity, which is hard both to explain and to understand. The problem lies in the nature of the different narratives. For example, conspiracy theories usually tend to reduce the complexity of reality, creating more understandable content that, with its false simplicity, can contain the uncertainty generated by high volume news and information. This is also why this content is easily shared by people and generates a high level of commitment by consumers. Conspiracy theorists create a climate of disengagement and mistrust from mainstream problems of society and from officially recommended practices which often requires an effort for the citizen to understand (Bessi, Coletto, et al., 2015). The mainstream news and views become read as plots conceived by powerful individuals or organizations in an attempt to hide the truth (Mocanu et al., 2015b).

The World Economic Forum in 2013 started listing massive digital misinformation as one of the main risks for modern society (http://reports. weforum.org/global-risks-2013/title-page/). Disinformation can be harmful for citizens and society at large. This includes threats to democratic political processes. It can undermine trust in the information society. So, disinformation represents a danger that we have to confront collectively and try to contain to realize a full democratic, societal, technological and economic progress, keeping

in mind the respect of the freedom of expression (Gabriel & de Cock Buning, 2018).

Recent works (Bessi, Coletto, et al., 2015; Bessi, Scala, Rossi, Zhang, & Quattrociocchi, 2014; Mocanu et al., 2015b) have shown that the more people are exposed to false information, fake news and rumours the more their tendency to be credulous will increase. As we have seen, belief formation and revision are deeply influenced by the way different social spheres attempt to make sense of events or information. This phenomenon is undeniable when considering internet users, who embedded in homogeneous clusters (or filtered bubbles) (Aiello et al., 2012; Bessi, Petroni, et al., 2015), process information through a shared system of meaning (Bessi, Zollo, et al., 2015; Zollo et al., 2015) and "*trigger collective framing of narratives that are often biased toward self-confirmation*" (Del Vicario et al., 2016).

Lazer et al. (2017) report that most people who share fake news, share lots of news in general. But knowing how many individuals share or read fake news is not the same as knowing how many people were affected by it. Evaluations and studies of the medium-to-long run impact of exposure to fake news on audiences are non-existent in the literature. We can only make some inferences from our general knowledge about the effects of media, which suggests there are "*many potential pathways of influence, from increasing cynism and apathy to encouraging extremism*" (Lazer et al., 2018). A widespread culture of misinformation can change collective preferences (Reedy, Wells, & Gastil, 2014), which in turn can affect public discourses and outcomes (Fowler & Margolis, 2014), and so also individual decisions (Tafuri et al., 2014).

5 A STARTING POINT:
FAKE NEWS AND EDUCATION

Up until now we have explained almost everything that is known about fake news, how they spread and why they function so well in the information society. Now we must ask us if there are antidots that we can use against fake news. And if they exist, how can we discover and learn to use them? But above all we should ask ourselves if they are so dangerous, and at the same time so facilitated by the hidden mechanism of the information society, how can we act to inform people and train new generations? And what kind of instruments and tools can we give them to help them in their growing with enough conscious and preparation not to fall for fake news?

We think that the answer still resides in education. In this case, when we talk about education, we mean scholarly education. We will see how even if great pedagogists, sociologists, philosophers and even some politicians have talked in time about how crucial would be to have a media education and a critical thinking development in school, governments strategies and the lack of willingness to change the status quo have suffocated those voices in time.

It is from the invention of the first public media (television) and above all from its massive diffusion in the 70tees, that a debate goes on about "media literacy", which with the advent of the computer first and then the world wide web became "new media literacy", "digital literacy", "ICT literacy", "critical literacy", "information literacy", and so on. The fact is that the contents of the discussion have not change in time, and so are the results: new media literacy remains something that is reserved only for young adults who are studying to become journalist. But

even in their training the topic is treated more as something strictly connected to the ethics of the job, so the debate is focused mainly on how journalists should behave to produce good quality information. Unfortunately, very few is written about how they can evade from falling for fake news. Now the question become: is there a way to evade from fake news? And is there anybody who can teach common people how to defend themselves from them?

5.1 EDUCATION AND CRITICAL MEDIA LITERACY: A NEVER-ENDING STORY

From what we have seen up until now it is clear that when we speak of fake news and education there is not only one specific competence or skill involved. What we have in mind when speaking about new media literacy and critical thinking development is an interpretative relationship with a complex, symbolically-encoded, technologically-mediated text.

Allan Luke and Peter Freebody (Allan. Luke, Freebody, & Muspratt, 1997; Allan Luke, 1998) have been developing a dynamic understanding of literacy as a social practice where critical competence is one of the necessary components. This sociological framing of literacy as a family of practices, in which multiple practices are crucial and none alone is enough, fits well into our multi-perspectival approach to critical media literacy. Luke and Freebody (1999) wrote that effective literacy requires four basic roles (not necessarily sequential or hierarchical) that allow learners to: "break the code"; "participate in understanding and composing"; "use texts functionally"; and "critically analyze and transform texts[3] by acting on knowledge that texts are not ideologically natural or neutral". This normative

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[3] When we speak about "text" connected to fake news we are not speaking only about something written. As we know, fake news can pass also through a complex combination of layers made of words, images, voices, videos that are created ad hoc to deceive other people. This is the reason why being able to "break the code" can be an essential part of the process for tackle fake news.

approach offers the flexibility for literacy education to explore and critically engage students with the pedagogy that will work best for individual teachers in their unique situation with the different social and cultural needs and interests of their students and local community (Douglas & Share, 2007).

Feminist theory and standpoint epistemologies provide other contributions to the field of critical media literacy. For example, Carmen Luke (1994) combines cultural and feminist studies to allow for an "epistemological standpoint which acknowledges difference(s) of identity, the cultural constructedness of 'Theory,' 'History,' and 'Truth,' and the cultural dynamics of our own labor as academic researchers and teachers" (Luke, 1994). She links a feminist political commitment to transformation with recognition of media misrepresentation and stereotyping.

Luke argues that it is the teacher's responsibility within the classroom to make visible the power structure of knowledge and how it benefits some more than others. She insists "that a commitment to social justice and equity principles should guide the media educator's work in enabling students to come to their own realizations that, say, homophobic, racist or sexist texts or readings, quite simply, oppress and subordinate others" (Luke, 1994).

She writes that critical media studies must "extend to explorations of how individual and corporate sense-making tie in with larger socio-political issues of culture, gender, class, political economy, nation, and power" (Luke, 1994).

While media education has evolved from many disciplines, an important arena of theoretical work for critical media literacy comes from the multidisciplinary field of cultural studies. This is a field of critical inquiry that began decades ago in Europe and continues to grow with new critiques of media and society. From the 1930s through the 1960s, researchers at the Frankfurt Institute for Social Research used critical social theory to analyze how media culture and the new tools of communication technology induce ideology and social control. In the 1960s, researchers at the Centre for Contemporary Cultural Studies at the University of Birmingham added to the earlier concerns of ideology with a more sophisticated understanding of the audience as active constructors of reality. Applying concepts of semiotics, feminism, multiculturalism, and postmodernism, a dialectical understanding of political economy, textual analysis, and audience

theory has evolved and media culture can be analyzed as dynamic discourses that reproduce dominant ideologies as well as entertain, educate, and offer the possibilities for counterhegemonic alternatives (Kellner, 1995).

In the 1980s, media studies research began to enter the educational arena. With the publication of Len Masterman's "Teaching the Media" (1985), many educators around the world embraced media education less as a specific body of knowledge or set of skills, and more as a framework of conceptual understandings (Buckingham, 2003).

Critical media literacy challenges the power of the media to present messages as nonproblematic and transparent. Because messages are created by people who make decisions about what to communicate and how to communicate, all messages are influenced by the subjectivity and biases of those creating the message as well as the social contexts within which the process occurs. Along with this encoding subjectivity come the multiple readings of the text as it is decoded by different audiences in different contexts. Media are thus not neutral disseminators of information because the nature of the construction and interpretation processes entails bias and social influence.

Semiotics, the science of signs, study how meanings are socially produced from the structural relations in sign systems, has contributed greatly to media literacy. Roland Barthes (1998) explains that semiotics aims to challenge the naturalness of a message, the "what-goes-with-out-saying". Even Masterman (1994) asserts that the foundation of media education is the principle of non-transparency because media do not present reality transparently or as a simple reflection of the world because media messages are created, shaped, and positioned through a precise construction process. This construction involves many decisions about what to include or exclude and how to represent reality. Exposing the choices involved in the construction process is an important starting point for critical inquiry because it disrupts the myth that media can be neutral conveyors of information.

The cultural studies approach provides a major advance for understanding literacy as Len Ang (2002) explains: "Textual meanings do not reside in the texts themselves: a certain text can come to mean different things depending on the

interdiscursive context in which viewers interpret it." The notion that audiences are neither powerless nor omnipotent when it comes to reading media contributes greatly to the potential for media literacy to empower audiences in the process of negotiating meanings.

As Bell Hooks (1996) puts it: "While audiences are clearly not passive and are able to pick and choose, it is simultaneously true that there are certain 'received' messages that are rarely mediated by the will of the audience". Empowering the audience through critical thinking is essential for students to challenge the power of media. Audience theory views the moment of reception as a contested terrain of cultural struggle where critical thinking skills offer potential for the audience to negotiate different readings and openly struggle with dominant discourses.

The ability for students to see how diverse people can interpret the same message differently is important also for multicultural education because understanding differences means more than merely tolerating them. The process of grasping different audience readings and interpretations enhances democracy as multicultural and reduce the risk of hyper-partisanship which is one of the focal elements for the aggregation of people on the base of fake news contents. Education for a pluralistic democracy depends on a citizenry that embraces multiple perspectives as a natural consequence of varying experiences, histories, and cultures constructed within structures of dominance and subordination.

Critical media literacy involves the politics of representation in which the form and content of media messages are interrogated in order to question ideology, bias, and the connotations explicit and implicit in the representation. Beyond simply locating the bias in media, this concept helps students recognize the ideological and constructed nature of all communication.

Analyzing content also requires questioning the omissions in media representations. Working with students as young as preschool age, Vivian Vasquez (2003) encourages them to ask the following questions: "Whose voice is heard? Who is silenced? Whose reality is presented? Whose reality is ignored? Who is advantaged? Who is disadvantaged?".

Critical media literacy also encourages students to consider the question of why the message was sent and where it came from. Too often students believe

the role of media is simply to entertain or inform, ignoring the economic structure that supports it.

Our multi-perspectival approach to critical media literacy is most relevant to progressive and transformative education when taught through a democratic approach with critical pedagogy that follows the ideas of progressive educators like John Dewey and Paulo Freire. Dewey championed education for democracy and placed emphasis on active learning, experimentation, and problem solving. Dewey's pragmatic approach connects theory with practice and requires students to similarly connect reflection with action (1916/1997). Using a problem-posing pedagogy, Freire (1970) calls for critical consciousness that involves perception of concrete situations and problems, as well as action against oppression. The problem-posing that Freire exercises requires dialogical communication between students and teachers where both are learning and teaching each other. This method necessitates praxis, critical reflection, together with action to transform society. For this reason, media education should ideally involve both critical analysis and student media production.

Critical media literacy in our conception is tied to the development of skills that will enhance democratization and civic participation. It takes a comprehensive approach that teaches critical skills and how to use media as instruments of social communication and change. The technologies of communication have become more and more accessible to young people and ordinary citizens and can be used to promote education, democratic self-expression and social progress.

If we combine critical autonomy with critical solidarity, we can teach students to be independent and interdependent critical thinkers, who will be less dependent on media framing and representations. Critical media literacy offers an excellent framework to teach also critical solidarity together with the skills that can challenge the social construction of information and communication. The absence of critical analysis and production in most schools, along with the last decades of unprecedented technological innovations and globalization, make critical media literacy vital for personal freedom, the detection of fake news and a more informed use of new technology.

The current fascination with technology and interest in computer literacy has been receiving significant public support, yet it lacks a critical-analytical framework to analyze these new tools. The focus on acquiring technological skills, as if technology were neutral, has left a major pedagogical void that could degenerate in the growth of ignorant generations in the information society, which can seem a paradox, but it is one of the greatest danger for democracy and for individual freedom in our time.

5.2 FAKE NEWS, EDUCATION AND THE RESEARCH FOR THE BACKDOOR

In despite of the great importance that a training in critical media literacy would have, and to all the scientific debate and political discourses that have been done during the years, nobody has still found a way to introduce critical media literacy formally inside schools.

Carmen Luke (2004) suggests that if media literacy can be brought into schools through "the 'backdoor' into computer literacy education" then it may have a better chance of being accepted other than improve significantly computer education. Even if her suggestion may be seem simple, it has a series of problems that we can not under evaluate: 1) it draws all the attention on the willingness of teachers (usually mother language teachers) to do the hard work inside classrooms; 2) It ignores the problem of the training of teachers to critical media literacy; 3) It forgets the fact that a serious study curriculum should be the same for every student at every age; 4) It ignores the fact that a proper curricula for schools about critical media literacy has never been done. This would be a very big project that would require hard work and field experiments before it could be declared successful. Also, it would require that teachers, experts, and policy makers work together. Literacy for once must be reframed into the network

society context to expand the definition of a text and include new modes of communication to enhance our critical analytical processes to explore concept as audience reception, individual and group ideology, social justice, and oppression, as well as the political, economic, historical, and social contexts within which all messages are written, read and shared.

Critical Media literacy education should be also linked with education for democracy, where students are encouraged to become informed citizens and media literate participants in their societies. In this sense, critical media literacy should thus be linked with other form of literacies, like information literacy; technological literacy; arts; social sciences, and the process of a democratic reconstruction of education. It should become a common thread that runs through all curricular areas because it has to deal with communication in a society where everything is connected.

As Dewey (1916/1997) argued, education is necessary to enable people to participate in democracy, for without an educated, informed, and literate citizenry, strong democracy is impossible. Moreover, there are crucial links between literacy, democracy, empowerment, and social participation in politics and in everyday life. Hence, without developing adequate literacies, differences between "haves" and "have nots" cannot be overcome, and individuals and groups will be left out of global economy, networked society, and every form of culture.

Living in the information society is not enough to merely understand media, students need to be empowered to critically negotiate meanings, engage with the problems of misrepresentations, under representations and fake representation of reality, and being able to produce their own alternative media carried by values and by the ability to critically evaluate the content of the message that they are reading and only then decide if share it or not.

Critical media literacy offers the tools and framework to help students become subjects in the process of deconstructing injustices, expressing their own voices, and struggling to create a better society.

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5.3 FAKE NEWS AND DIGITAL LITERACY

In the last decade, assuring a good formation and training in new media and digital literacy seems to have become a priority also to policy makers, as Buckingham (2009) underlies, reporting the words of Viviane Reding, the European Commission's Information Society and Media Commissioner:

"In a digital era, media literacy is crucial for achieving full and active citizenship… The ability to read and write – or traditional literacy – is no longer sufficient in this day and age… Everyone (old and young) needs to get to grips with the new digital world in which we live. For this, continuous information and education is more important than regulation" (Buckingham, 2009).

But how much of the "good intentions" manifested by policy makers and politicians have actually found a properly space inside school's curricula? And even when this happen on a formal level, what really happens inside classrooms? Are teachers really ready and willing to make the jump from the "old world", where teaching was simple and natural for them, for entering in the "information society reality" where mastering digital and ICT instrument and new digital tools is essential to teach critical media literacy?

Even in this case, the discourse could go on for pages. When speaking about fake news it is obvious that new media literacy and critical thinking as we defined them are at the very core of the discussion. But at the same time, we can not make any reasoning about them without underling the fact that to study such an important – and at the same time undefined topic – is essential having at least a basic knowledge and awareness about the media through which they are disseminated.

We don't want to design teachers as a branch of poor fellows, moving without coordinates in a world they can't manage to understand. Indeed, living the change is a great difficulty for everybody, and being born inside the change could be both

an advantage and a disadvantage. The reason is obvious: maybe it is true that our children can use new technology better and more intuitively than the majority of adults can do, but what is also true, is that they still have not developed the cognitive means and critical categories to understand it (Considine, Horton, & Moorman, 2009). Also, if it is undoubtfully true that a mutual learning is possible and that in many situations it actually happens, it is also true that educators are in charge for the responsibility of the teaching they are promoting. So, it can be acceptable that pupils can be more skilled in the use of technology and have a higher level of digital literacy – understood as a practical and intuitive ability to use technology and digital tools to create contents – but what is not acceptable is that their teachers do not have the competences to follow them in their way of work and thinking.

Critical thinking and new media literacy[4] have become an important form of 'life skill', and also a form of competence that is a prerequisite for full participation in society (Buckingham, 2009). Sooner than we think our life will be simply impossible without having digital competences, but also very miserable without critical media competence. What is not acceptable then, is the refusal from the school system as an Institution to confront itself seriously with the "rules" of the Information society and with all the new challenges that it entails. Teachers and media educators have to leave the idea of a disenchanted, post-modern society (Cambi, 2006) and accept the fact that new technology challenges our understanding of what it means to be literate. Students today live in an environment in which reading and writing, through digital media as well as traditional texts, are pervasive. So the great challenge for teachers today have become to connect the literacy skills that students develop in their social environment – mainly when they are at home and often without their parents control and guidance – with the literacy that they would normally learn in the school environment (Considine, Horton, & Moorman, 2009).

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[4] Which up until now we have fuse in a unique form of literacy and called it Critical media literacy.

5.4 FAKE NEWS AND CRITICAL DIGITAL INFORMATION AND MEDIA LITERACY: AN AMBIGUOUS OBLIGATION

Now that almost anyone can produce and disseminate contents easily, using Internet as a channel with enormous potentiality for transmission, critical media literacy appears to be essential and its traits even more sophisticated. (Livingstone, 2004). That is based on the fact that individuals are often not even aware that they are being educated and constructed by media culture, as its pedagogy is frequently "invisible and unconscious" (Douglas & Share, 2007; Kellner & Share, 2005). When talking about fakes, it can not obviously be good for the individual, or for his/her community, adventuring in the Internet jungle without questioning about how developed his/her critical competences are.

Assuming a critical approach to new media can make people aware of how media can construct and impose meanings and values, influencing and educating. It also involves cultivating skills in analysing media codes and conventions, abilities to criticize stereotypes and ideologies, but also competencies to interpret and evaluate the multiple meanings and messages generated by new media texts. All these features are undoubtedly important when we are talking about fake news detection. As a plus, these are also skills that can surely be helpful in the pedagogical process of growing good citizens, making individuals more motivated and competent participants in a democratic society (Douglas & Share, 2007; Kellner & Share, 2005).

As Kellner et al. (2007) said, "a critical media literacy brings an understanding of ideology, power, and domination that challenges relativist and apolitical notions of much media education in order to guide teachers and students in their explorations of how power, media, and information are linked". As we seen fake news have a lot to do both with a wish for domination, connected to an ideology, and with the willing of gaining power and visibility.

But, since fake news are spread mainly through social media network, an almost immediate recognition and the ability to question ourselves, our biases and our previous knowledges in a very short amount of time are also very important skills for the detection of fake news and false information. In fact, we can not deny that if something is considerably changed in the way we dedicate attention to reading news and information, that thing is time. To put it as Johnson-Eilola (1998) said it, already 20 years ago, most of us see the world through two separate, different and sometimes contradictory categories: time and space. Part of us lives following the chronological nexus, uniting the past with what is becoming. Living in time, we think of our history as something that we have built and from what we are built in a slow, continuous accretion of experiences. But another, and often younger part of us lives in space, in a place where things happen on the surface in a state of incessant stimulation. We experience things as a chaotic everything-all-at-once noise. We do not pass and receive information linearly, but experience them simultaneously, across global communication networks and we need to be able to critically scrutinize and scroll huge amounts of information (Douglas & Share, 2007; Kellner & Share, 2005). And if it is true that many adults are terrified of this place, it is also true that many children live there happily (Johnson-Eilola, 1998).

This signals us that to deal with fake news and the complex of literacies we need to master to face them. We also have to surpass a generational problem, often connected with previous generations relationships with new technologies, and with a consistent scientific paradigm revolution that can not be under evaluated (M Castells, 2010).

Also, people who have to teach are often less used to digital literacy, social media and technology than their pupils are (Kellner & Share, 2005), and they use them in different ways and for different purposes (Hobbs & Jensen, 2009). This could also be one of the reason why, in scholarly education, the problem of fake news and the teaching of new media and critical media literacy have been avoided almost completely, despite their undeniable importance (Douglas & Share, 2007).

In the contemporary epistemological panorama both poststructuralist, feminist, and critical pedagogies stress the importance of valuing students' voices and contributions for deconstructing new media and being able to interface themselves critically with the supposed authority (Kellner & Share, 2005). Being able to teach and use different literacies to analyse information and fight the element of political manipulation that is entrenched in the fake news phenomenon would undoubtedly be a big step towards the formation of the citizens of tomorrow.

Another big issue that can not be under estimated is that even if the spreading of false information is not a new phenomenon, the amount of false news disseminated for political purpose, the level of accessibility to them and the use of social media as primary channel of information, are always more used even by digital immigrants (Buckingham, 2007). Their level of importance had grown so fast in the last 10 years, creating new forms and level of culture, that researchers and experts from different fields are still struggling to find a common and linear definition of what digital competences are and what kind of skill put under that label.

5.5 THE PROBLEM OF TEACHING CRITICAL MEDIA LITERACY IN A WORLD FULL OF "EXPERTS"

Addressing the theme of new media information and fake news inside classrooms since primary scholarly level should become an imperative for every educative system, with policy documents and school curricula featuring digital and new media critical literacy as an important desired student outcome (Douglas & Share, 2007). Also, there should be an increasing attention in the building of teacher-targeted materials and courses for initial and continuous professional training on how to educate pupils for living consciously in this new digital information era.

Obviously, the implementation of digital and new media critical literacy is strictly connected to a set of different abilities and key intellectual challenges, between which we can surely count the learning of new media literacy, digital literacy, and critical literacy (Kellner & Share, 2005).

New media literacy has been described as the ability to access, analyse, evaluate, and create messages in a variety of forms – whether they are symbolic or printed – and to gain the intellectual tools and capacities to fully and freely participate in one's culture and society (Douglas & Share, 2007; Kellner & Share, 2005). These four components -access, analysis, evaluation, and content creation- support each other as part of a nonlinear, dynamic learning process (Livingstone, 2004).

Evaluation is strictly connected both to critical and new media literacy and could be considered as a prequel skill to the ability to detect fake news in digital environment. In the World Wide Web context, where everyone can produce and get access to almost every kind of content (Hobbs & Jensen, 2009) – fake news included – the ability to estimate the value of an information content is crucial, as it is the ability to teach users to question the authority, the authorship, the objectivity and the quality of mediated information (Douglas & Share, 2007; Livingstone, 2004). So, we can see how new media literacy does not only have to be related to concepts like Critical literacy, ICT literacy, and Digital literacy; dealing with fake news and their consequences has to do also with concepts like "digital citizenship" and "authority" emphasizing the skills and knowledge needed to be effective and aware of your own choices in the increasingly complex social media environment (Douglas & Share, 2007; Hobbs, 2008; Hobbs & Jensen, 2009).

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Figure 2: Ongoing curriculum reforms related to digital competences in primary and general secondary education (ISCED 1-3), 2018/19
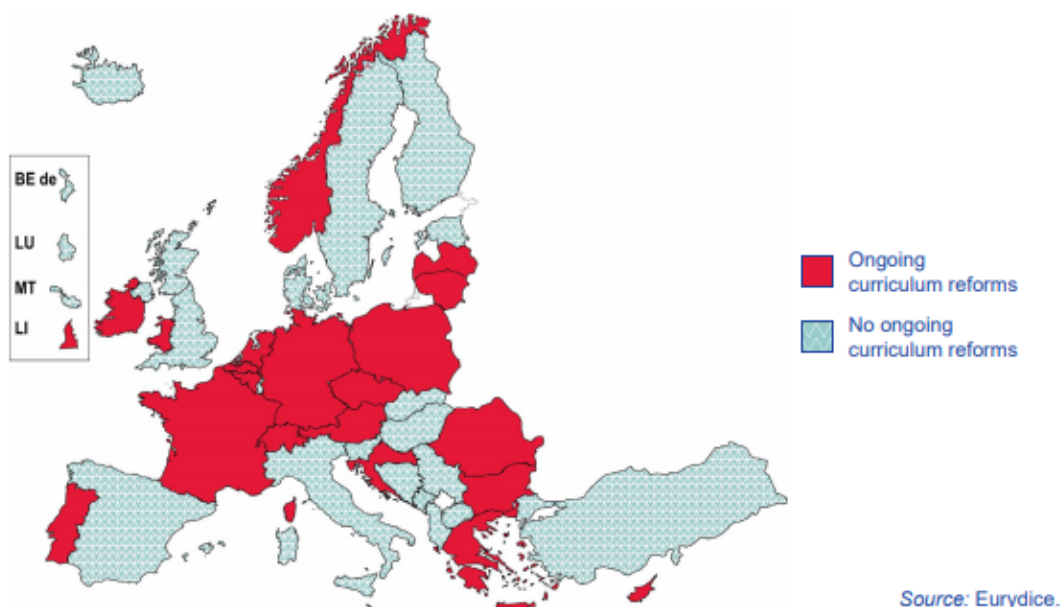
Tom Nichols (2017) is very sceptical about this possibility. In his opinion:

"The foundational knowledge of the average American is now so low that it has crashed through the floor of "uninformed," passed "misinformed" on the way down, and is now plummeting to "aggressively wrong." People don't just believe dumb things; they actively resist further learning rather than let go of those beliefs" (Nichols, 2017).

And what is worst is not even the fact that people refuse competence and new learning, but the fact that in many occasions and especially when conversations happen with the filter of ICT they do it with great rage. Maybe the attacks toward competence are more visible today only thanks to the internet ubiquitous presence and to the lack of discipline that characterise social media conversations. Or maybe it is just because receiving new information and news 24 hours a day make us forget easily what we said, wrote or red the day before, and how we said it. But the arrogance and the rage of this new refusal for competence are a signal that the real point is no more situated in trust: on line

discussion have become a mix of narcissism and disregard for knowledge (Nichols, 2017).

If we look at global society from this point of view the situation is almost dramatic. Never in history so many people had access to so much knowledge and never they refused with so much energy and resistance to learn. We are witnessing the end of the same idea of competence. A breakdown – fuelled by Google, based on Wikipedia and imbued with blog and social network's post – of any division between professionals and laymen.

We are faced with something worse than ignorance: it is an unfounded arrogance, the indignation of an increasingly narcissistic culture that cannot bear even the slightest hint of inequality, of whatever kind it may be. The expression "end of competence" - used by many authors in the contemporary debate - means that we rely on experts as technicians. There is no dialogue between them and the wider community, but the use of consolidated knowledge as if it were a pre-packaged commodity to be used when necessary, as long as one wishes to do so.

On the other hand, many experts who belong to the academic world have abdicated their duty to interact with the public. They have entrenched themselves behind their own jargon and irrelevance, preferring to interact only with one another. The end of competence is not just a rejection of existing knowledge. It is a rejection of objective science and rationality, which are the foundations of modern civilization. It is a sign of "a policy obsessed with therapies and full of mistrust for formal politics", chronically "skeptical of authority" and "prey to superstition". We closed the circle, starting from the premodern age, in which popular wisdom, filled inevitable gaps in human knowledge, through a period of rapid development firmly based on specialization and competence, up to a post-industrial and information-oriented world, where every citizen considers themselves experts in anything.

People now believe that having equal rights in a political system also means that everyone's opinion on any topic should be accepted on a par with that of anyone else. The attacks on consolidated knowledge have a long pedigree, and the Internet is only the most recent instrument in the context of a cyclical problem,

which in the past has afflicted television, radio, the press, and other innovations in the same way.

This is the opposite of education, whose goal should be for people to learn for life. We live in a society where the acquisition of the smallest knowledge is the arrival point of education, rather than the beginning. This is a dangerous thing and also the remarks on the fact that we may be living in an age where misinformation drives out knowledge.

In part, this conflict over the public square is just a noise, amplified by the internet and social media. The internet collects false news and improbable ideas and then spreads this lousy information, and these arguments based on poor judgment on the whole technological world. Perhaps the point is not that people are duller or less willing to listen to experts than a hundred years ago: it is just that now we have the chance to hear all the voices.

The end of competence, however, is a different problem compared to the historical data of low levels of information among the uninitiated. The question is not the indifference to consolidated knowledge; it is the emergence of an absolute hostility towards such knowledge. This is a new phenomenon: it is a process of aggressive replacement of the opinions of the experts, or consolidated knowledge, with the conviction that whatever the subject, all opinions are equally valid.

The distrust of the experts and the more anti-intellectual attitudes that accompany it are problems that should be improving and that are getting worse. The end of competence is a threat to the material and civic well-being of the citizens of a democracy.

Today ignorance is a trend: not agreeing with someone means lacking respect; to correct someone means to insult him; to refuse to attribute to all opinions the dignity of being taken into consideration means to have narrow views.

A reasoned scepticism is essential not only for science but also for a healthy democracy. Instead, the end of competence is more like an attack of general moodiness, a rejection of authority indistinguishable from the facts, while real competence, the kind of knowledge that others rely on, is an intangible but recognizable combination of education, talent, experience and recognition by

their peers. The difficulties, however, emerge when people begin to believe that knowing a little about something means "being competent". Knowing something is not the same as understanding it, and understanding is not the same as analysis.

American culture, in particular, has tended to nurture romantic notions of this kind on the wisdom of the common man or the initiative of self-taught genius. These ideas have allowed the birth of a gratifying social fantasy in which ordinary people overcome the severe professor or the nerd scientist with the strength of determination and ingenuity.

One of the fundamental reasons why experts and non-specialists have always triggered mutual irritation is that they are all human beings. In other words, they all have similar problems in the absorption and interpretation of information. Even the most educated people can make elementary reasoning mistakes, while the less intelligent ones are prone to ignore the limits of their abilities. Experienced or profane, our brains work (or sometimes do not work) in a similar way: we hear things the way we want to hear them and reject the facts we do not like. We want to believe what we want to believe.

The years of better education, greater access to data, the explosion of social media, and the lowering of access barriers to the public arena should have improved our ability to reflect and decide on paper. Instead, it would seem that this progress has worsened the situation rather than improved it.

However, it appears that the most specific reason why unqualified or incompetent individuals overestimate their abilities much more than others is that they do not have a crucial skill called "metacognition". It is the ability to know when one is not good at something, to step back, to observe what one is doing, and thus to realize that one is doing it wrong.

6 A PICTURE OF SCHOOL AND TECHNOLOGY

> "Da alcuni decenni ormai i programmi di insegnamento delle Scuole e degli Istituti Magistrali e la conseguente preparazione culturale e professionale dei maestri sono sottoposti a dura critica, con abbondanza di ineccepibili argomentazioni e con il più ampio consenso di tutti gli addetti ai lavori (pedagogisti e insegnanti stessi). La critica è evidentemente giusta, ma i maestri non sono responsabili della loro inadeguata preparazione e, se vanno stimolati e assistiti in un impegno qualificato e rigoroso di aggiornamento, vanno comunque difesi e compresi per quel che sono e per quello che fanno in condizioni senz'altro non facili, almeno per due ragioni: essi sono nient'altro che il prodotto della scuola e, in generale, sono migliori della scuola che li ha formati per quanto di personale e di intenzionale mettono nella loro opera" (Rossetto, 1985).

If we do not consider some terms that could perhaps cast doubt on an attentive reader of his contemporaneity, this brief introduction by Antonio Rossetto was actually written in 1985 and if even then we talked for decades about discussions always concerning the same subject - namely the situation of the teachers in the Italian school - this means that at least in the last 50 years the school, and all the sciences that should take care of it - first of all the pedagogy, has not made significant steps to really change the working conditions of its professionals. The reforms follow one another, the curricula sent by the Ministry of Education change almost annually, as well as the evaluation criteria for schools and paths, the qualifications and the requirements - always higher and demanding to obtain - for become teachers at any school level.

The teaching experiments change, new teaching models and methodologies take their place, while new media and tools make their entrance on the scene with constancy and a rhythm that would make their work at least as unnerving for any professional who should always keep up to date.

Behind this scenario of change and apparent continuous innovation, an immobilism is hidden and often an approximate conscious resistance on the part of those who live it at school and build it day by day, very difficult to scratch.

Apart from the presence of a few seriously motivated professionals, who bring mind and body to make up for the shortcomings that the school system conceals and reproduces continuously, the Italian school appears as an institution in love with itself, deprived of energy, emptied of authority and purpose and resigned to pulling the oars in the boat to let oneself be carried away by the current of time passing. This means less attention to the training needs of pupils and teachers and a lower inclination to accept what technological innovation could offer today, both through its tools and means and for didactics that does not live only on content disconnected from time.

Our time, with its discontinuities, and its technological and media intrusiveness, is also very skilled in laying bare the structural defects of institutions that by now sound like archaic, based on moral and ethical crutches that are no longer enough to keep them upright. In particular, what is difficult to understand, according to the experiences carried out during the research, is the need on the part of teachers not to consider their educational and training tasks completed.

What would be needed in school are new stimuli that can lead teachers towards an increasingly multi-thematic, diversified and divergent formation. Even more, in addition to the freshmen, in-service teachers should be persuaded to experiment with new tools that technological innovation has produced for the digitization of the school (Mura & Diamantini, 2014) and to accept the multiple experiences that our age offers us, even when they do not feel the necessity of doing it.

To tackle this topic seriously, also analysing its objective limits, it seems useful to try to answer at least four questions:

1) Who is the teacher? What kind of studies did he do before choosing to devote himself to this profession?

2) What is his role today? Moreover, what society thinks should be his role today?

3) What does he expect from the community in which he lives and works? Also, what do citizens expect from him?

4) What can he give to his students and school? And what does the school - intended as an organizational structure and as an institution - enable him to do?

It is certainly not possible to think of giving exhaustive answers to questions of such broad scope and of such elaborate social value, however it is possible to attempt - on the basis of the research experiences reported here - to try to give answers that are at least partial, which can act as a guide in the reading of the data collected during the research. What we will try to propose here are "ideal profiles" of answers, which can enable us to analyse the gap between the being and the duty of the teacher, as an educational figure, and of the school, as a place of experimentation of digital innovation, with all the difficulties and challenges it entails. This means giving space to the discussion of topics that digitalization brings, without ignoring important contemporary topics (such as that of fake news and the introduction of digital media literacy in schools), that we still have to understand completely, but that are still acting on the long-term impact on the life and choices of the students: the future citizens of tomorrow.

6.1 TECHNOLOGY IN THE SCHOOL

The advent of the internet and progressively of the different forms and applications of information and communication technologies (ICT later on) has revolutionized all the areas of our socialization: trade, industry, economy, financial services, healthcare, and administrative services, the same social relations and our free time.

Nowadays it is unthinkable for an employee to work without a computer, as well as for most people not having a smartphone with which they can quickly connect with other people, regardless of where they are, and access information

quickly, passing with a simple click or touch all the geographical barriers that separate us physically. In other words, computers, tablets, and smartphones are some of the mobile devices used by a heterogeneous and increasingly young public that characterize the digital society.

New technologies are becoming increasingly dominant and decisive in being part of the everyday experience of the world of childhood and adolescence (Buckingham, 2003; Livingstone et al. 2011).

Familiarity and dependence on new information and communication technologies has prompted Mark Prensky to coin the famous term "digital native", or students who have "spent their entire lives surrounded by computers, video games, digital music players, video cams, cell phones, and other toys and tools of the digital age" (Prensky, 2001, p. 1). In other words, "native speakers" of the digital language of computers, video games, and the Internet"[5].

Possessing digital skills and knowing how to use ICTs have become indispensable prerequisites for today's citizens.

If the school's task is to train the citizens of tomorrow, how does it educate its students about the correct and critical use of ICTs? Alternatively, if the digital revolution has invested all sectors of our society, accelerating the practices and usability of daily information, what impact has it had, and is it having on school education? Also, through what forms has it been configured, and is still changing its form?

Before trying to answer these questions, we need to try to understand what role the school plays in this ongoing process.

One of the definitions of Digital Media Literacy (DML) is the capacity of using new media from a technical, informational, and social point of view (Fastrez, 2010; Fastrez & De Smedt, 2012). Consequently, Media Education (ME) is an educational activity aimed at understanding the communicative and interactive

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[5] Prensky also noted a real generation gap among young people, namely digital natives, compared to adults. According to the author, the former are endowed with different cognitive styles due to their early immersion in the world of digital technologies, while the adults are considered in contrast to digital natives and named "digital immigrants". For a deepening between natives and digital immigrants see also Rivoltella (2006). For a critique of the opposition between digital natives and digital immigrants, see Helsper and Eynon (2010).

environment that surrounds individuals, in other words, educating how to convey information and the appropriation of the media themselves (Jacquinot-Delaunay et al. 2008).

This digital literacy represents a concrete challenge for the whole society that must be accepted first of all by the school, so as not to ignore the relationship of the new generations with new technologies and instruct students on how to consciously use new media, how to understand them and interpreting them critically, in other words, educating them to a real digital awareness. At the same time, educational institutions have the task of reducing the digital divide, which is still widespread, which prevents some students from knowingly using the information and communication technologies they have available.

The school represents the cultural and educational agency par excellence and is called to respond in person to the challenge induced by the cultural change underway concerning innovation and technology. Consequently, a redefinition of the role that this institution has within the society is needed, investing more and more in a digital school that contemplates the renewal of teaching, learning environments, inclusion in educational practice, of contents and digital languages, and the management of administrative procedures. In addition to this, the strengthening of the digital presence in schools would promote a rapid and integrated activity and more usable teaching by students.

So that it does not represent an anachronistic institution, it is a priority to renew the school's teaching methods, not only by equipping schools with cutting-edge tools, but by investing in the training of their teachers: it is fundamental than that those who work in the school world are prepared to use these new training and innovative methodologies, as well as new digital contents, in such a way as to offer a teaching in step with the times. It is a structural work that acts both on the mindset of teachers and on the teaching tools. If, on the one hand, it is up to the professors to be willing to review and reformulate their traditional teaching methods, on the other, it is the task of educational institutions to accept this challenge and provide all the necessary support to the teaching staff during this complex process of renewal.

Adapting teaching styles to the lifestyles of digital natives (Ferri, 2010), means adding a valuable and essential piece to a general framework in which digital change is already happening.

Who better than the school can have the task of critically spreading digital innovation training at the same time the future citizens of our society?

Among the various educational agencies (formal and informal), the school surely represents the most suitable exponent to drag society into this complex process of change.

However, this task is far from simple. In addition to rethinking the functioning of its activities, as well as its traditional teaching systems, the school must cope with a constantly evolving process in which knowledge becomes obsolete in a short time and, therefore, constant updating is continuously required. In this context, the new teaching methods are anything but linear and uniform, and the actions to achieve this change are not always clear for the training and educational systems.

An information society pervaded by ICT requires a school capable of offering a digital competence capable of teaching to select, evaluate, and critically analyse the information that continually bursts into everyday life (Calvani, 2009).

In this sense, the school must not only promote a critical use of ICT but also carry out school activities through these technologies on three different aspects that are strictly related to each other: the didactic, technological and organizational framework.

The introduction of ICT in schools involves a series of objectives that define a structured framework of specific activities and contents. Furthermore, ICTs offer shared work tools that allow teachers to offer a new kind of education to their students.

According to the Unesco report (2011), the main advantages of teaching about the use of ICTs would be found first of all in the involvement of learners during the lesson, in their active participation, which would have a direct impact both on their learning, and on facilitating and comparing peers. Besides, ICTs are particularly useful when used with students with Special Educational Needs (BES).

Tools such as the multimedia board (LIM), e-books, multimedia and interactive lessons, informal learning platforms on which to discuss, rather than the development of e-learning platforms in which it is possible to review the lessons or part of its contents, are certainly in line with the needs of the digital natives who occupy today's school desks. In other words, an education that combines standard tools with innovative methods would support students' work, both individually and collectively.

Another arduous task for schools is to try to smooth out the still widespread digital divide in all its forms.

In this regard, it is necessary to distinguish different levels of digital divide. The first level consists in the inequality between those who can take advantage of ICTs and those who remain excluded (Castel, 2001; Norris, 2001). The second level concerns the skills possessed by an individual in order to be able to make the best use of ICTs in all their potential (Hargittai, 2002; Iannone, 2007). Finally, a third level concerns digital competence, or the ability to optimize access to and use of ICTs, based on one's own needs and benefit (Van Deursen, Helsper, 2015).

As rigorously summarizes Elena Gremigni,

"*the volume and composition of the economic, cultural, social and symbolic capital of users are factors that have a decisive influence on their ability to use ICTs in a positive way and these tools end up reproducing or even increasing existing social inequalities. [...] The different positioning of the users in the social field is therefore correlated to the different forms of digital divide and results for many in the impediment or in the limitation to access and seize the potential of the available resources and in difficulty to face problematic situations*" (Gremigni, 2019, p. 2).

In this scenario, it is necessary to pay attention also to fake news and how these affects especially the digitally disadvantaged users. The absence of adequate critical information interpretation tools confuses the user of these and the impact that fake news has on students is not to be underestimated and must be accepted and understood by schools, as their consequences can be very

damaging (think for example of cyberbullying, hate speech) (Mascheroni & Ólafsson, 2018).

6.2 TECHNOLOGY AND SCHOOL IN ITALY

Among the eight key competences of lifelong learning (Lifelong Learning Program) listed by the European Union, we find in Section 4 the Digital Competence, defined as "[the] confident and critical usage of information and communications technology for work, leisure and communication" (European Council, 2006)[6].

This concept is also reaffirmed in the European Digital Agenda (DEA), in which in its various points it establishes the key role that information and communication technologies must have in order to achieve the set objectives. As can be read in the document, one of the goals of the DEA is precisely to improve digital literacy and skills, since

> *Although the Internet is part of daily life for many European citizens, some categories of the population are still excluded from media literacy in the digital environment. Furthermore, the EU is hampered by a shortage of ICT practitioner skills.*
> *In order to promote employment in the ICT field, the Commission proposes to give priority to digital literacy and skills through the European Social Fund. It also wishes to develop tools to identify and recognise the skills of ICT practitioners and users. The aim is to set up a European framework specially designed for ICT professionalism.*
> *In order to overcome unequal access to digital literacy by European citizens, Member States should promote e-accessibility7 in particular when applying the Audiovisual Media Services Directive* (COM, 2010).

As mentioned, the lack of full use of ICTs would affect, among the various sectors, the development of public services and, among these, also includes the school. To face of these demands, the Italian legislation has integrated the

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[6] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=LEGISSUM:c11090&from=EN.
[7] The report defines the *E-Accessibility* "the integration of disabled and/or elderly people with regard to information and communication technologies (ICTs)" (COM, 2009).

indications of the European Union by promoting various laws in this regard, firstly concerning the bureaucratic and administrative management of the school.

In 2007, a National Plan for the Digital School was discussed for the first time, whose main objective was to promote digital innovation and adapt school environments to this introduction.

From 2008 to 2012, the following actions were implemented:

- The diffusion of the Interactive Multimedia Whiteboard (LIM) released in Italy since 2008. This tool provides more engaging and interactive teaching and learning style for students. In addition to this, this device makes it possible to save the lesson on the school server and then be able to be reviewed by the student even at home. It also offers the possibility of correcting tasks in digital format and connecting through the network in order to guarantee students temporarily absent from attending the lesson.
- Cl@ssi 2.0 actions - "no longer the class in the laboratory, but the laboratory in the classroom". It is an initiative that provides the provision of devices to students able to connect with each other and with the IWB, favoring an environment of exchange and continuous learning between students and teachers.
- Scuol@ 2.0 Action. It is an initiative that involves the school's involvement in a path of greater innovation, from education to the organization of the school structure itself.

Since 2012[8], various provisions have been introduced to optimize public spending and the organization of educational institutions, both from an administrative and an educational point of view, as suggested by the DEA.

These actions included a general process of digitalization concerning the registrations (no longer on paper but online), the electronic report card, the online registers (actually implemented, due to lack of funds, only starting from the

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[8] For more information, please refer to law n.135/2012 "Disposizioni urgenti per la revisione della spesa pubblica con invarianza dei servizi ai cittadini".

2013/2014 school year) and sending electronic communications to pupils and families.

Since the 2013/2014 school year, the Electronic Registry has been introduced, whose goal is to promote more efficient management of the pupil's entire school career, reporting the same information stated in the class paper register (absences, justifications, disciplinary measures, topics covered, evaluations, communication of homework, etc.).

With the Ministerial Decree n. 209 of March 26, 2013, the gradual adoption of digital or mixed school textbooks, starting from the 2014/2015[9] school year, is also introduced.

Among the various purposes, these processes wanted to streamline the high bureaucratization that characterizes the work of teachers. By digitally processing the data relating to each student, it was also given the opportunity to visualize more transparently and logically the general framework on the progress of each student, crossing data with those of colleagues, guaranteeing transparency to families and improving overall organizational and educational quality.

The minimum conditions schools would have had to guarantee to start the following provisions were the presence of a Wi-Fi network within the school building and devices such as PCs, tablets or notebooks for each teacher or one for each class.

Subsequently, the implementation of the National Digital School Plan (Piano Nazionale Scuola Digitale: PNSD) is configured as one of the fundamental pillars of the law number 107 of 2015 (http://www.paschinimarchi.it/legge-107-del-13-luglio-2015-riforma-della-scuola-con-note.pdf), better known as "La Buona Scuola" ("The Good School"). For the first time, a concrete school digitization project to be implemented by 2020 is explicitly regulated and aims to develop the skills of students and teachers in the field of technological innovation. The main objectives of the plan, listed in paragraph 58 of Law 107/2015, include:

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[9] Initially, the allocation of digital or mixed texts concerns the first and fourth levels of primary school, the first class of the 1st-grade secondary school and the first and third class of the second-grade secondary school.

- The development of the student's digital skills;
- The enhancement of educational and laboratory tools to improve school education and innovation;
- The adoption of technological and organizational tools aimed at promoting governance, transparency, data sharing, and information exchange;
- Teacher training on educational innovation and digital culture;
- The training of the administrative staff for digital innovation in the administration of the educational institution;
- The strengthening of network infrastructures, especially connectivity;
- The enhancement and sharing of the best school experiences through a national network of research and training centers[10];
- The definition of criteria and purposes for the adoption of educational texts in digital format and the production and dissemination of materials, including self-produced ones.

As can be seen from this list, the central elements of the plan are digital education and innovation in the school system to promote increasingly interactive, active, and inclusive teaching, rather than solely transmissive.

The PNSD provides various actions, themselves grouped into tools, skills and content, training, and support, configured as follows:

- Access;
- Spaces and environments for learning;
- Digital identity;
- Digital administration;
- Student skills;
- Digital entrepreneurship and work;
- Digital content
- Staff training;

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[10] The exchange of experiences between classes located in different places, participation in thematic networks, and the organization of "window-networks" is encouraged.

- Backing.

The prerequisite for turning a digital school starts from access, which is to guarantee a broadband optical fiber, connectivity, and cabling in order to ensure educational innovation through digital technologies.

The second objective concerns the spaces and environments for learning and consists in aligning the school building with the evolution of the teaching itself, in such a way as to be able to configure new environments in which more and more space is left to new technologies, therefore suitable for hosting the new laboratory teaching.

This translates into the provision of alternative classrooms for more extensive learning, which can accommodate multiple classes or groups with, for example, workstations for individual and collective use of the web. Action 6 of the Plan, Bring Your Own Device (BYOD), provides that students can bring their electronic device to school (netbooks, tablets, the same smartphone, or any tool that can connect via wireless[11]), to be used for educational purposes in teaching activities designed by the teacher. The following points, digital identity and digital administration, focus on creating a digital profile for each student and teacher through a single authentication system (Single-Sign-On) and foresee the implementation of the administrative digitalization of the school.

The student's skills indicate the promotion of students' digital skills through the creation of innovative scenarios and a common framework for the digital skills of the students themselves.

In addition to this, the PNSD has specific objectives not only linked to the school as a place of learning: it also aims for its opening towards the territory, for example through school-work alternation and the implementation of a curriculum for digital entrepreneurship, in order to develop advanced practices and didactics in synergy with local policies, for work and businesses.

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[11] According to the 2018 ISTAT survey, Citizens, Businesses and ICT, 89.2% of adolescents (14 years and over), mainly use the smartphone to access the network, followed by 45.4% who use the PC and a 28.3% using a laptop or netbook. 26.1% said they used a tablet while 6.7% and other mobile devices such as ebooks, smartwatches, etc. (Istat, 2018).

Finally, the plan promotes the backing and training of teaching staff, to be able to bring digital innovation to every school and school level. An important role for the realization of this path is identified in action 28 of the plan through the figure of a digital animator. He should be the professor who has the task of following and monitoring the activities of their school concerning digital content.

This aspect is further detached in the 2011 UNESCO report on ICT Competency Frameworks for Teachers. Teachers and school administrators must know and implement the new tools for digital training, use the new classroom settings, the Virtual Learning Environments, the different solutions for the management of the training and the organizational processes of the school and the hardware devices.

As for the use of digital devices, as already mentioned by the Istat data of 2018, most Italian teens use the smartphone as the main tool to access the internet. This data is also confirmed by the EU Kids Online 2017 (http://www.lse.ac.uk/media-andcommunications/assets/documents/research/ eu-kids-online/reports/EU-Kids-Online-Italy-report-06-2018.pdf) report, in which it emerged that the smartphone is used daily to go online by 97% of children between 15 and 17 years and by 51% of children between 9 and 10 years (Mascheroni & Ólafsson, 2018). This report also confirms that a lower percentage (42%) use a computer every day to access the network and 20% of the boys use the tablet.

The report also highlights differences based on the gender and age of children: the use of all digital devices increases with age and boys have a wider range of devices than their female peers[12].

According to the international TALIS (Teaching and Learning International Survey) survey carried out by the Organization for Economic Cooperation and Development (OECD) regarding the year of 2018, it emerged that Italian teachers need more training in ICT. Specifically, 35.6% of teachers feeling prepared for

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[12] This is also explained by the fact that some devices are considered more masculine than feminine. Consider, for example, some video games (Mascheroni and Ólafsson, 2018).

the use of ICT for teaching and 18.7% of Italian teachers feeling prepared to teach in multicultural settings.

Compared to the countries participating in the OECD survey, 47% of the teachers stated that they would use ICTs "always" or "frequently" for students in the classroom. The figure is lower than the average of the countries that participated in the TALIS survey (53%).

Although 52% of Italian teachers have declared that they have received training for the inclusion of ICT in school education, only 36% think they are prepared for it. During the 12 months prior to the survey, 68% of teachers participated in professional development activities, including the use of ICTs for teaching. However, this aspect is the topic on which teachers report a strong need, 17% in Italy (compared to 18% of the OECD average).

A further report by the OECD Skills Outlook 2019 - Thriving in a digital world (https://read.oecd-ilibrary.org/education/oecd-skills-outlook-2019_df80bc12-en# page1) noted substantial differences in the digital preparation of the various countries that participated in the survey.

As can be seen from the results, a small group of countries is leading the digitization experience: Belgium, Denmark, Finland, the Netherlands, Norway, and Sweden.

Their population is both highly prepared to use the various technological applications, and supported by effective learning systems. Then there are countries like Japan and Korea that have great potential to benefit from digitization, but they need to adopt a more comprehensive set of policies so as not to leave the older segment of the population behind. A third group is made up of Italy, Chile, Greece, Lithuania, Slovakia, and Turkey, which represent the group with the most consistent digital delay, unable to address the various challenges that digitization brings with it adequately. These countries must enhance the lifelong learning systems of individuals, both formal and non-formal. Italy is deficient in many parameters considered in the report.

From the results presented, it can be seen that only 36% of people in Italy, aged between 16 and 65, can use the internet in a complex and diversified manner. This value scores at the lowest level among all the countries analyzed,

whose average exceeds 58%. Besides, only 21% of individuals aged 16 to 65 have a good level of literacy and numeracy skills. This is the third-lowest percentage among the countries analysed.

As far as the school is concerned, the report shows that half of the students in Italian schools do not effectively use ICTs for educational purposes. This aspect reaffirms what previously stated, that the simple presence and access to a device are not enough to improve the performance of the students if digital models integrated with teaching are not used. Once again, to make a real breakthrough in the path of digitalization of the school, it is not enough to provide cutting-edge devices, but, especially, to trigger a necessary and functional cultural change on teaching methods.

This report also finds the gaps in the skills of our teachers in the digital environment: 3 out of 4 teachers said they needed ICT training to carry out their profession. In general, the report shows a lack of training and digital competence of all Italian workers.

7   HOW CAN WE STUDY FAKE NEWS?
THREE METHODOLOGIES' EXAMPLES

The topic of fake news is quite new, and there are still many things to understand about it. Therefore, there is also a lot of research and studies about it. Also, there are many ways in which we could study fake news and everything that turns around that argument. Every day new articles and papers are published, using the most different methodologies. Some of them are qualitative studies that allow us to discover how fake news works at a deep and emotional level. This kind of studies usually try to explore the association of emotions and unconscious believes in identifying how subsystem of radicalized groups can form themselves inside a balanced echo-chamber (Brugnoli, Cinelli, Quattrociocchi, & Scala, 2019). This particular way of investigating the topic usually requires in-depth semi-structured interviews, focus groups or other methods that allow the researcher to investigate the topic at a profound level and gave us an idea of how people perceive fake news, and why they fall for fake news. Those kinds of research usually use clinical methods to allow the person involved to reason on the topic and also learn something about it while participating in the research.

Another way could be the analysis of social media contents and ways of writings that allows the researcher to go deep in the posts using methods as content analysis.

Others use computer programs made ad hoc to understand how the users interrelate themselves with the digital world and in particular, how they use social media or how they retrieve information online.

Then there are more traditional quantitative ways, where the main scope is to build questionnaires or other tools to collect data from the larger quantitative of people that could give back enough information to build a generalized framework.

For this chapter, we have chosen three articles which represent three different possibilities to study fake news, and we will describe them in order to show how different methodology can be applicated to study fake news.

7.1 Mixed method and games: inoculation for learning

As an example of mixed-method research about fake news, we want to present the methodology and tools used by Roozenbeek and van der Linden (2019). This study is particularly interesting because, differently from other research that try to reason about how to defeat fake news but do not present a practical solution to do it, they try to develop an instrument that could give a preemptive solution and could be also used inside schools and other educative settings to do some critical media literacy training (Van Der Linden, Maibach, Cook, Leiserowitz & Lewandowsky, 2017).

The game was tested at a secondary public high school in the central-eastern part of the Netherlands and involved mostly 16teen-year-old students who were randomly assigned to an experimental or control group. They choose to use the survey as a check method, together with a reading task to evaluate their hypothesis and the effectiveness of the fake news game.

The reading task involved reading one of two (randomly assigned) fake news articles about an issue that related closely to the topic of the game.

The two articles were as similar as possible in their topic, setup, structure, length, language use, and in terms of the techniques, they used to mislead the audience (Hansen, 2017; Marwick & Lewis, 2017).

Additionally, a structured and fixed number of standard and popular 'fake news' tactics were implemented in both articles, like hyperbole (McCarthy and

Carter, 2004), the common man appeal (Hansen, 2017), arguments from authority, conspiratorial reasoning (Hofstadter, 1964; van der Linden, 2015), demonization of the out-group (Atkinson, 2005), whataboutism (Hansen, 2017), and the ad hominem attack (Walton, 1998).

Before the start of the game, participants also had to fill out a questionnaire to measure their familiarity with the topic, political ideology, and demographic background information.

Directly after playing the game (for about 30 minutes), participants were asked to read the fake news article (which had the same topic of the one they had to write during the game) and fill out a second questionnaire to measure their judgments about the article while the control group watched an unrelated presentation that was part of the regular lesson.

As a central method for their research, they choose to use inoculation theory instead, transforming it in a method to "vaccinate" people against fake news, inducing attitudinal resistance against persuasion and propaganda (van der Linden, 2017).

Inoculation has a quite long history; what is curious about it is the idea that information and critical reasoning can be used to form "mental antibodies". In the mind of its first theorists there was the idea that "preemptively exposing people to a weakened version of a (counter) argument, and by subsequently refuting that argument, attitudinal resistance can be conferred against future persuasion attempts" (Papageorgis and McGuire, 1961) (Roozenbeek & van der Linden, 2019).

To be able to produce the game and test their theories Roozenbeek and van der Linden got in contact with DROG, a Netherlands group of specialists who provide education about disinformation, in order to develop together a multi-player game.

The game's goal is to create a fake news article about a given topic, while its scope is to make players think about all the possible techniques and methods to do it. So, players become fake news producers that are prompt to think proactively about how people might be misled by producing a fake article in order to win the game.

During the game, participants are then divided into groups of 2-4 people, and each player has a randomly assigned character which is designed to reflect common ways people use to create fake news (Marwick & Lewis, 2017).

The four characters proposed are: (1) the denier, (2) the alarmist, (3) the clickbait monger, and lastly (4) the conspiracy theorist.

Each group is then given a "source card" explaining the background of the article that the players will produce and a "fact-sheet" in which the issue is explained in detail. Based on the specific goals (to produce a news article that reflects their character), players are then instructed to use the information from the fact sheet to write the fake news article. Even the fake news article has a systematic structure. It must contain: "(a) an image, (b) title, (c) header, (d) paragraph 1: numbers and facts, (e) paragraph 2: interpretation and presentation of numbers and facts, (f) paragraph 3: the cause of the problem, (g) paragraph 4: consequences of the problem, (h) paragraph 5: expert opinion, and (i) conclusion" (Roozenbeek & van der Linden, 2018). For every part of the article, a player must choose a card from a given set; each card presents and interprets the fact sheet in different ways, all consistent with one of the four characters.

When every player has finished writing its part basing himself on the choices that his character would have made, then the group put their part together so to form the final article.

The group that interprets at best all their roles in the writing of the fake article wins (Roozenbeek & van der Linden, 2019).

After the game, there was a significant difference in judgments about the reliability of the selected fake news article between the experimental and the control group. The first group rated the (fake news) article's reliability significantly lower than the control group. Even personal agreement with the fake news article was lower in the treatment group, telling us that playing the fake news game did have a significant indirect effect on perceived persuasiveness through reduced reliability judgments.

We can see how they have created and combined five different methods and tools, three quantitative and two qualitative, to create a research design for one single study and how they have shaped them to their needs to test if and how

fake news could be defeated by introducing inoculation as a study activity inside schools

7.2 QUALITATIVE RESEARCH DESIGN: SAME DATA, DIFFERENT USE

As second example, we would like to analyze an article by Polletta and Callahan (2017) who use storytelling as a tool to give sense to stories and narrations to try to understand what kind of role they can have in believing in fake political news.

In particular, they try to understand how people integrate information that comes from diverse sources, being well aware that people's opinions have some basis in their experience.

To prove their point, Polletta and Callahan (2017) elaborate on some in-depth interviews made by Hochschild (2016) - one of the most famous sociologist of her generation that used an ethnographic approach to enter in the reality of the community and made beautiful description about the reality she saw and selected in-depth interviews to the most influent member of the community. They use the data she collected and published to take information and examples from contemporary reality and make a meta-analysis.

The positive side of using qualitative methodologies and tools is that researchers can use almost every kind of methods and tools to collect data and make analysis, albeit the process is explicit and rigorous.

In their work of re-reading Hochschild work Polletta and Callahan discovered that people create their narratives retrieving information in many ways: reading, making comments, speaking with other people, sharing stories online, or simply talking and living. However, the real article's focus is on how much people, and in particular scholars, know about how storytelling works.

Both in media and online and offline conversations, people shape their experience and their version of reality. It happens because personal narratives are influenced - and sometimes even changed - by every story people read

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(online or offline) or hear on TV, by friends or acquaintances. Those stories, if they are repeated with a high frequency and by different mediums have the power even to substitute memory for history, and to make the experience of others seem as if they are their own, making truth lose its value.

This process is foster by the fact that stories are allusive (Polletta, 2006). To say it with Polletta word: "if all stories make a normative point, the point is rarely explicit", and we discover a story's point following reference to stories we have heard before. So, stories' persuasive power lies in their ability to call up other compelling stories creating familiar images in the collective unconscious as a base for the creation of new narrations.

7.3 QUANTITATIVE RESEARCH DESIGN: WHEN EMOTIONS NEEDS NUMBERS

As third example, we choose a still unpublished work by Martel, Pennycook, & Rand (2019) in which they choose to explore the role of emotions from a cognitive point of view, in the process of falling for fake news.

What attracted our attention was the methodology they used to investigate the specific topic of emotions in relation to the effectiveness of fake news. Usually, we are led to think that emotions are something that can be deeply explored by using qualitative methods. Instead, they produced and reported two studies for this research made entirely using quantitative methods, and in particular online surveys using Amazon Turk[13].

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[13] Amazon Mechanical Turk (MTurk) is a crowdsourcing marketplace that makes it easier for individuals and businesses to outsource their processes and jobs to a distributed workforce who can perform tasks virtually. This could include anything from conducting simple data validation and research to more subjective tasks like survey participation, content moderation, and more. MTurk enables researchers to accelerate the process of collecting data and allow people (in this case also called "workers" by the company) to be paid by the Requester (in our case, the researcher) as a price to the completion of the survey. (mturk.com).

As they declare at the beginning of the paper, their object of study was: "exploring the psychology underlying belief in news stories that are implausible and untrue. In particular, we focus on the role of emotional processing in such (mis)belief" (Martel et al., 2019).

Researches have shown how emotional arousal can be linked to a major propensity to share information (Cotter, 2008; Peters, Kashima, & Clark, 2009), and that social media, in particular, may favor emotionally provocative stimuli which are more likely to go viral (Crockett, 2017) and spread faster than real news stories (Vosoughi, Roy, & Aral, 2018).

Moreover, in a recent analysis, Bakir and McStay (2018) declared that what most differentiates fake news from other forms of content is the use of emotional targeting (Bakir & McStay, 2018). Also, recent analyses of the structure and content of fake news articles have suggested that fake news is designed to promote belief via the use of heuristics and simple claims, rather than through informative arguments (Horne & Adali, 2017).

From a methodology point of view, there are several reasons to consider this study; one is that prior work has been almost entirely correlational, comparing people who are more predisposed to engage in versus less reasoning. Therefore, it remains unclear whether there is a causal impact of reasoning on resistance to fake news – or a causal effect of emotion on susceptibility to fake news. In this research, Martel et al. address the issue by experimentally manipulating[14] reliance on emotion versus reason when judging the veracity of news headlines.

In study 1 participants had first to complete a series of demographics questions (i.e. age, sex, and political preferences, a choice due to the fact that all the news they had to judge in the last phase where all about political arguments). As a second step, participants had to complete the 20-item Positive and Negative Affect Schedule scale (PANAS; Watson, Clark, & Tellegen, 1988). For each item, participants were asked: "To what extent do you feel [item-specific emotion] at

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[14] In quantitative research manipulation is easier to manage than in qualitative one, because the researcher should have the possibility to keep in control all the variables, especially the environmental ones which can hardly be managed in field research.

this moment?" Likert-scale: 1 = Very slightly or not at all, 2 = A little, 3 = Moderately, 4 = Quite a bit, 5 = Extremely.

As a third step, participants had to read a series of headlines that appeared on social media, half of which were real news and half of which were completely fake. Half of the headlines were favorable to the Democratic Party, and half were favorable to the Republican Party. All fake news headlines were taken from Snopes.com, a popular fact-checking website for English speakers, while real news headlines were selected from mainstream news sources and selected to be contemporary on a timeline to the fake news ones. The headlines were presented as Facebook posts – so, with a picture accompanied by a headline, byline, and a source.

For each "post" participants were asked: "To the best of your knowledge, how accurate is the claim in the above headline" using a 4-point Likert-scale: 1 = Not at all accurate, 2 = Not very accurate, 3 = Somewhat accurate, 4 = Very accurate.

Quantitative analysis is far more coded than qualitative analysis. Even if it could resemble that it is a strict and too standardize methodology it has instead the possibility to enlarge the data analysis as far as one person can use statistic to interrogate the data and has a clear research design in mind. So, even when researching fake news, it could be used to create a framework in which elaborate new research hypothesis, but it could also be a suitable methodology for the in-depth studies of some peculiarity related to the main topic. The article we choose was a great example because it shows how we can also study delicate aspects of the psyche – as emotions – using already existing and validated surveys placed on the internet, where a researcher could rapidly collect data from all over the world, especially if he has the financial resources to use a well-known platform as Amazon MTurk and pay the participants (who remain anonymous in any case). At a certain point, it all depends on the ability of the researcher to choose and perform the analysis that will give him more interesting results. In study one, they decided to do a first analysis, in which they assessed the relationship between emotionality and perceived accuracy of real and fake news. They used the R packages lme4 (Bates, Maechler, Bolker, & Walker, 2015), lmerTest (Kuznetsova, Brockhoff, & Christensen, 2017), and arm (Gelman & Su, 2018) to perform linear

mixed-effects analyses of the relationship between perceived accuracy, specific emotions measured by the PANAS, and type of news headline (fake, real). A mixed-effects model allows them to account for the interdependency between observations due to by-participant and by-item variation. Since there were 20 emotions assessed by the PANAS, they also performed 20 linear mixed-effects analyses, obtaining interesting results.

8 THE EMPIRICAL RESEARCH

The growing awareness of the importance of ICT literacy has prompted national and international organisations to develop standards and items for measuring ICT literacy and every one of them focus on different components. Many researches, courses and tools focus their attention on features like: creativity and innovation; communication and collaboration; the ability to define, access, manage, integrate, evaluate, create, and communicate information; critical thinking, problem solving, and decision making; digital citizenship; and technology operations.

Seeing the relevance of the fake news phenomenon in this historical moment and the lack of researches about it in the educative field we opted to implement a quantitative research, using both pencil and paper and on line questionnaire to collect data from a big enough sample and have the instruments to generalise it to a broader population[15].

In this section, the steps that lead to the data collection and analysis are summarized. At the basis of the project lies the geometry of the research itself and the possibility of its future replicability on other segments of the Italian population or with foreign samples for comparison. Its formulation in the form of an empirically controllable "model", the planning by phases contained in the research design, the data collection, their analysis and finally the return to the theory allow to see the circular geometry that places order in a topic of research already complex and enigmatic in itself.

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[15] In a meta-analysis Tourangeau and Yan (2007) found that there is no significant effect of computerization on response. This is good news for researchers because it means that they can take advantage of the full range of self-administration options without great concern about differences in the resulting data.

In order to establish a research design, it is also essential to understand the relationship between theory and research. In the case of quantitative research, in fact, the relationship develops through strictly sequential connections with a strongly deductive approach (where theory precedes observation), and that moves from the perspective of justification, or rather the support provided by the empirical data of the theories previously taken into exam and hypotheses formulated. In this framework, the systematic analysis of the existing literature takes on a crucial importance.

To formulate hypotheses that allow a new research to have a solid structure a careful analysis of the existing literature up to that moment on the subject or on similar voices is essential. In our case, the analysis of the existing literature on the topic "fake news" and all the links that branch out to other sciences has required almost a full year of work, and has included the fields of education, psychology (cognitive psychology) and communication science. A specific focus was posed in the research-based literature produced in the last six years (from 2013 to February 2018) on the topic of fake news.

Once identified the core concepts that would be object of the analysis, the following step consisted in their operationalization. Concepts are the constitutive elements of a theory and needs to be transformed into empirically observable variables to allow the theory to be subjected to empirical control. The concepts themselves are often fuzzy, especially if they are formulated in the first part of the research or even before the research begins. The analysis of the literature helps to organize them into a structure and give them a sufficient order for the construction of a possible model and therefore for the definition of the research design.

Concluded these preparatory steps, it was possible to create a tool for data collection, and after its validation, proceed in the submission for the questionnaire to the selected sample.

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8.1 DESIGNING AND VALIDATING THE QUESTIONNAIRE

The analysis of literature allowed to create a structure for the variables considered of interest. The structure included a number of independent variables, related to the person of the teacher interviewed, and a set of independent variables, related to their perception of ICT. The structure is described in the scheme below:

Independent variables	Dependent variables
Anagraphic	Perception of fake news
Information media literacy	Perception of fake news and education
Media habits	

We hypothesized that the independent variables would have an impact in the perception of fake news among the sample, allowing the definition of different profiles according to relevant characteristics.

We then started to research previously validated instruments that would allow us to collect data on the variables of interest.

Despite the abundance of validated scales, to our knowledge, there were still insufficient scales explicitly developed to measure teachers' perceived ICT literacy self-confidence and their perceived ability to deal with fake news. Our study was unique in the way that we settled it in an educational environment and conceptualized ICT literacy and critical thinking as two fundamental components necessary to deal with fake news and at the same time being able to create or use stimulating experiences to teach pupils how to defend themselves from perilous and ambiguous information found on the internet.

In the very first phase we started to build an on-line survey, mainly based on the work done by Gordon Pennycook and David G. Rand, using example of fake news and real news to see if people were able to distinguish them and at the same time evaluate their level of cognitive ability and critical thinking with a CTR

scale. In their first experiments on fake news, they were trying to understand why people fall for fake news and how hyper partisanships played a role in their ability to discern true information from false ones. While working on the translations of their validated scales and trying to add pieces that we judged useful for our research we collide ourselves with our own research questions. Pennycook and Rand experiments have been pioneering in the study of fake news and allowed to create some of the vary first and major hypothesis on how fake news work in people mind, but replicating their experiment was not our aim. Instead it was leading us on the wrong path. As we have seen in the theoretical part, being able to distinguish between something true and something fake is not always so obvious and easy. Also, we were not so concerned about the political reflexion that their analytical process is supposed to raise, nor were we interested in analysing how high were the CTR's score of our teachers. Our interest was strongly fixed on the educative side and on how much teachers knew about fake news, what was their degree of confidence with ICT and what were their strategies to teach students how to deal with fake news.

The administered questionnaire intended to detect:
- the possible proximity or distance of teacher's profiles from the academic discourse on fake news and education;
- the approach and awareness towards the fake news phenomenon, what teachers think about what the duties of the school system are, and the responsibilities of educational policies about these issues.

The questionnaire is composed of a set of scales:
1. The first scale touches the aspects concerning digital technologies and education, digital literacy and teachers' self-evaluation in this aspect. The scale used is based on the "perceived ICT literacy scale" proposed by Lau & Yuen (2015) in their study. The scale was reduced from 17 items to 7 for compliance reasons. We eliminated items from the original scale if they were clearly intended for a student audience or too outdated (i.e., "I am able to send an email").

2. The second scale analyze the main components defining fake news in the sample. The second scale represents the opinion of teachers in the mass media and how they disseminate information. In this case the teachers were asked to express their opinion on each topic submitted, on a scale of 1 to 10, of which 1 indicated "strongly disagree" and 10 "strongly in agreement". Also, in this case we find ourselves in front of a scale taken from a previously carried out study (Ashley, Maksl, & Craft, 2013) with the same purpose we estimated when we started to build the questionnaire. Similarly, to the first scale analyzed, we found ourselves having to reduce the items present, going from 15 to 10, to make the questionnaire as a whole as lean as possible. The removed items coincided with excessively specific questions about the use of lights and photography in the news or items whose translation was not relatable in the Italian contest. The strong Cronbach's alpha (0.832) shows, however, the scale holds sufficient consistency to be considered useful for our study. In the validation phase of this particular scale we could see how, despite all the specifications included in the delivery and despite the global context of fake news, most of the teachers started the compilation thinking about school texts rather than editorial publications, arriving only in a second time to realize the real object of the questions asked.

3. In the third scale, the questionnaire investigates what a fake news is among the respondents, and the closeness of general ideas to those emerging from the literature. Opposing to the previous scales, this one has been created ad hoc after the literature review on fake news. We wanted to measure how much teachers knew about fake news and more precisely what they thought about them, which characteristics they assigned to fake news following their imagination, knowledge and perception, and how close or far this representation was from the one of academic researchers. Every item has been taken from different definitions of fake news found in the academic literature and teachers had only to value their agreement with them This is a very important data because it gives also the measure of how media and social media describe fake news and give the right

instruments to people to defend themselves from them without having to trust algorithm that are still not reliable. Like before, also this one is a Likert scale, where teachers had to score how much they agreed or disagreed with a list of terms or phrases that described fake news. The possible option for the score to assign to each item went from 1 (completely disagree) to 10 (completely agree). At the end of the item list one open question gave the possibility to add characteristics or comments.

4. In the fourth scale of the questionnaire, teachers were asked to evaluate their personal relation with fake news, their experiences and level of confidence. Also in this case 9 statements were created ad hoc, and the level of agreement detected with a Likert scale going from 1 to 10, in which 1 indicated "strongly disagree" and 10 "strongly agree".

5. The "fake news and education" aspect, exploring the impact these have on the interviewees as teachers, the role that they think the school should play in order to contrast them and the strategies that could be adopted by educational agents to combat this phenomenon.

   a. In the first part, the teachers were asked which strategies could be adopted in the education of the students to counter the fake news. Nine statements were presented for each of which the teachers were asked to express their opinion. The tool used has always been the scale from 1 to 10, in which 1 represents "strongly disagree" and 10 "strongly in agreement". Items from E1 to E5 presented strategies to be implemented to support students in facing the problem of fake news, while items E6, E7 and E9 proposed actions that limited exposure to the fake news problem.

   b. In the second part, teachers were asked to express their opinion about the role that the school system should play in education against fake news. Also in this case the teachers were invited to give their opinion in agreement or disagreement on eight statements, through a scale ranging from 1 to 10, in which 1 indicates "strongly disagree" and 10 "strongly in agreement ". Furthermore, the interviewees were given the

opportunity to be able to indicate other possibilities, through a special space to write an open answer.

6. The next part of the questionnaire introduces a possible scenario (Mura, Bonsignore, Diamantini, 2010), inviting the teacher to identify himself with the situation described and to tell how he feels and what attitude and behavior he would adopt. In this part of the questionnaire a scenario was presented to the interviewees and asked to position themselves in this regard. They had to imagine themselves in a heated discussion in class in which one student declared he had read the news online, which presented quite uncertain sources, of some immigrants who had attacked a disabled boy by breaking his leg.

7. In the fifth and last part, the socio-demographic data of the sample are collected, including a number of questions aimed at profiling their media and internet use. Some questions of the questionnaire give the possibility to the interviewees to add and deepen some points, if they consider it necessary.

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Information media literacy knowledge	Attitude towards fake news	Profiles of proximity or distance from the academic discourse about fake news and education
Personal info	What kind of caracteristics define a fake news?	
Where and how do they get news: Do they use only traditional information media? Do they use only digital/online information media? Do they use both/none?	How would teachers behave if a fake news was affecting their activity inside school? (scenario)	**Profiles of approach towards fake news** (i.e.: grade of consciousness about the fake news phenomenon, grade of belief in their abilities to manage it, etc…)
	What should the school system do in their opinion to dispose a better teaching for pupils, to defend themselves from fake news?	
Sample description concerning information gathering and new media use ability	How teachers define fake news How would they behave when put into a situation triggered by it What they think the school system and policy makers sould do to prevent the spread of the phenomenon	**Profiles of approach towards the duty of the school system and the educative policies reforms** (i.e.: should the government find new ways and give new instrument to teachers to handle with the phenomenon?)

We validated the questionnaire in three different session. In the first round we engaged some experts to let them evaluate the structure of the questionnaire and the accuracy of the translation of the items that we took from already validated scales. Then we ask teachers from different grade of schools and from different part of suburban and peripheral cities near Milan to fill out the questionnaire with me, and tell me everything they felt or had in mind while they were compiling it. We asked them if the questionnaire was understandable; if it was too long or too

hard to complete; if they would have make some changes in the writings of the instructions or add some specifications to make the items more clear.

Every session has been recorded in order to make it available for the team, so that it was possible to evidentiate the most significant comments. Every validation round produced significant changes and we kept on interviewing teachers until there were no more comments from them and the results gave us a good distribution of results in every scale.

8.2 DATA COLLECTION ISSUES: PAPER AND WEB

In a complicated social problem, we always have additional variables that may have important consequences for the outcome (Gilbert et al., 1977) and bias can be introduced through interviewers' purposive selection of respondents within each quota group (Krosnick, 2018).

An important area of data collection mode research has been on the use of mixed-mode designs. These often represent best practices with regard to reducing costs and improving response rates (Tourangeau, 2018).

One goal for some surveys using mixed-mode designs is maximizing comparability between modes; the goal is that the same person should provide the same responses to a survey conducted by any mode. This has brought about a design approach known as unimode designs. The notion behind the unimode design is that mode effects should be minimized at all costs. When implementing a unimode design, there are a number of considerations that arise that are not reflected in single-mode designs. For example, instead of optimizing the survey features for a single mode, questionnaires and procedures would need to be designed to ensure equivalence across modes (Tourangeau, 2018).

In a mixed-mode design, researchers combine multiple data collection methods to meet the challenges of single mode surveys and improve coverage

of the intended population, to increase response rates, and to reduce survey costs (de Leeuw & Toepoel, 2018)

Web surveys have now become one of the most prominent survey data collection methods in Europe and the USA. Web surveys and especially online panels are very cost effective, have a short turnover time, and combine the advantages of self-administration with computer technology. As a result data quality in well-designed online surveys is high, especially when sensitive questions are asked. However, some major disadvantages of single mode online research are undercoverage, as not everyone has Internet access, and high rates of nonresponse. To overcome these problems, and still enjoy the advantages of web surveys, a mixed-mode approach with web surveys as one of the data collection methods in the mix is an attractive option (De Leeuw & Berzelak, 2016; Tourangeau, 2017). While a mixed-mode approach may solve major coverage and nonresponse problems of online surveys, a new technological challenge is facing survey designers as mobile devices, such as, smartphones and tablets, are increasingly being used to access the Internet. Web surveys are now morphing from a computer-oriented (i.e., desktop or laptop PC) into a multidevice (i.e., PC, smartphone, and tablet)-oriented concept (Buskirk, 2015; Couper et al., 2017).

Many researchers doing web surveys do not necessarily think of themselves as doing mixed-device surveys and rarely account for the different types of devices that respondents are using when assessing survey errors. A mixed device survey is not a mixed-mode survey in the traditional sense of the word. In a mixed-mode approach two disparate data collection methods (e.g., a self-administered online survey and an interviewer administered telephone survey) are combined. In a mixed-device survey, we have one overall data collection principle: a self-administered, computer-assisted (online) survey. However, respondents may choose to respond through a variety of devices. These devices not only widely vary in screen sizes, but also in data entry interface (e.g., keyboard and mouse, touchscreen, on screen keyboard), and the question arises whether or not answers obtained via smartphone and tablet are comparable to answers obtained from pc or laptop. Excluding mobile respondents may lead to

serious coverage errors (see Peterson et al., 2017) and researchers should design optimal surveys to accommodate for different devices (e.g., Buskirk, 2015).

8.3 THE SAMPLING AND THE SPREADING STRATEGY

The sample used during the survey was a sample of convenience, but already significantly stratified.

The distribution of paper-based documents took place mainly in the peripheral belt of the Milanese in 10 all-inclusive institutes containing 7 primary schools, 7 secondary schools and 4 second-level secondary schools containing all the different school addresses (high schools, technical and professional institutes) both day and evening.

With regard to the online sample, it was instead decided to spread the questionnaire both through contacts with the school offices of 5 different municipalities and through access to groups of teachers already present on Facebook, also inviting word of mouth among colleagues via the app "whatsapp" messaging system to broaden the sample on a national scale and make a future generalization of the analysis results more significant.

Following the first analysis it emerged that 476 questionnaires were filled in validly for the purpose of the survey. The analysis of the averages, of the standard deviations and more generally of the frequencies did not show great variations in the answers between paper questionnaires and online questionnaires, if not in some strategic points that will be underlined later. This allowed us to analyze jointly and in depth the data obtained through the different methods of administration and to make initial hypotheses on the possibility of clustering the sample. The variables collected for the purpose of identifying the main characteristics of the respondents are the personal data profile, including age, sex, studies carried out, work, grade of the teaching school, common teaching, subjects taught, type of teaching school, role of the teacher in the school (digital

animator, member of the innovation team, neither) and finally the main sources of information and use of social networks.

To improve coverage and response flood we chose a mixed contact strategy for the diffusion of the questionnaire. It was partially spread using online means to reach a national sample (such as social networks or instant messaging application) and partially manually distributed in paper and pencil format using a criteria of proximity and convenience.

A recent trend is to evaluate information made publicly available on social networks such as Facebook, Twitter and LinkedIn. The appeal of these datasets is their size and scope. Using them as a means data can be collected on nearly any topic. Even if using these techniques to collect data may hold great potential for social scientists, they also present different challenges (Keeter, 2018)

When using a web surveys a good design of the questionnaires and other "ancillary" materials such as official mails and personal invitations can aid in maximizing response rates (Brick, 2018).

This kind of approach, then, raises many questions. Who joins these poll-taking clubs? What are their real characteristics? What do we know about the reliability and validity of their responses? Are respondent identities verified? Are responses validated? What sorts of quality control measures are put in place? What survey weights are applied, how were they obtained, and what is their effect? What claims are made about the quality of these data, and how are these claims justified? (O'Muircheartaigh, 2018).

A bit different is the case of paper and pencil survey. In that case I could be sure about the characteristics of the sample. Since I choose a convenience sample for the paper and pencil survey, me and my collaborator took the questionnaires into schools of the Milan hinterland, asking the Principals or trusted teachers to help us in the spreading and recollection of them. Surveys have been taken into fifteen different schools. Most of them where omni comprehensive institutions, containing different level of training, so we reached seven Primary schools, six Middle schools and two High schools. Questionnaires stayed anonymous, but we can be sure about the work identities of the people

who filled them out. As always, we can not be 100% sure about the reliability of the answers but the quite high rate of questionnaires collected compared to the ones distributed and the variety in the response quality made us confident about their validity.

In order to try to overcome this obstacle we decided not to organise sessions in every school where teachers had to fill out the survey under the eyes of a researcher, in a fix amount of time. We wanted them to be at ease with it and have all the time they need to reason on the different items, especially on the scenario. So we decided to simply leave the questionnaires in the various schools with the Principals authorisation, and a presentation letter in which we explained the purpose of the study. This left the teachers free (both in the online and in the in-person situations) to choose if take and compile the questionnaire or not. We also left to everyone 30 days to do it, specifying again at the beginning of every battery that the purpose of the questionnaire was not evaluative.

9 FINDING AND DISCUSSION

The analysis of the data followed the following structure:

- Description of the sample
- Monovariated analysis
- Exploratory factor analysis
    - ICT in education (self-confidence)
    - The news and publishing world (representations)
    - Fake news (representation and self-confidence)
    - Fake news in school (representations, role of the education system, strategies to contrast)
- Construction of scales
- Identification of relevant variables
- Definition of profiles (cluster analysis)

9.1 THE SAMPLE

The sample is composed of 476 respondents (199 online and 277 pen and paper questionnaires) working almost in totality in public schools[16]. Only 5% of answers

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[16] It is important to point out that in Italy, the educational system is made up of three types of schools: public (administered by the State), private (not administered by the State), and "Scuola paritaria". This last one is a sort of mixed school between public and private: it is a public school with private management. Traditionally, the diffusion of public schools is higher than the private one.

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come from private (but officially recognized as equivalent to public) schools. Of them, 394 were female and 82 male, and average age is 50 years old. Gender and age distribution represent well the general distribution among the population of Italian teachers, as the profession sees a large majority of women, and average age is generally quite high. In fact, if we look at the distribution of the sample between ages, we can see that 25% of them has between 26 and 43 years, the next 25% is between 44 and 51, the third 25% between 52 and 56 and the last quartile has between 57 and 68 years.

sex
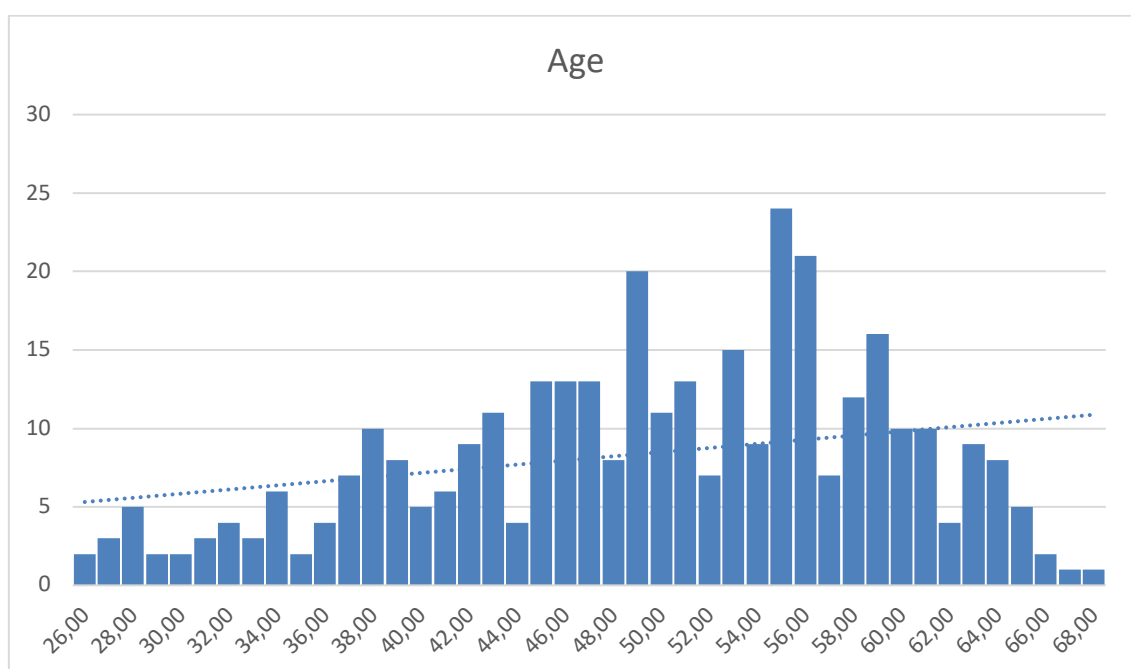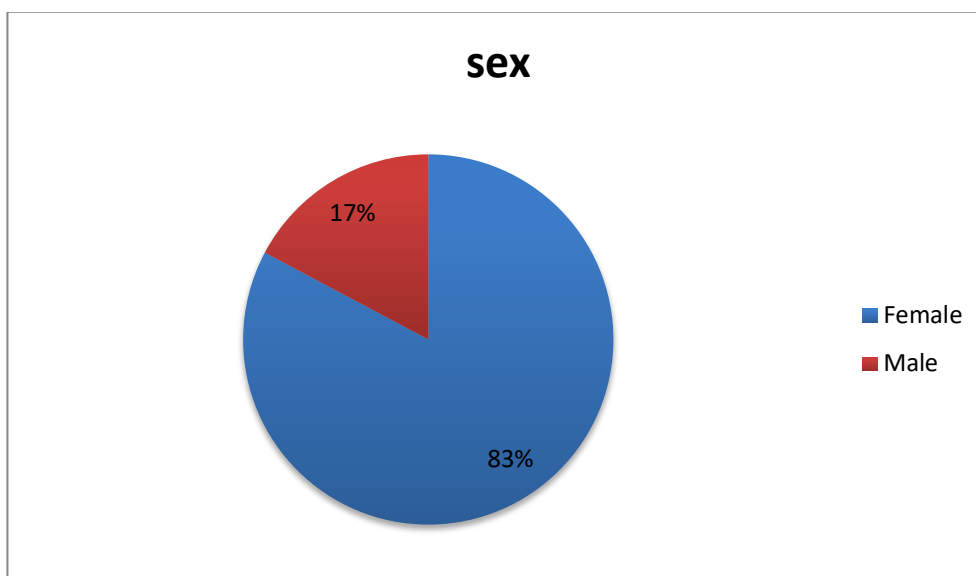
The majority of the sample has a high education degree or even a PhD, while about 21% of it only reached secondary education. Almost half of the sample has pursued humanistic studies, while the other half is distributed between secondary education, scientific degrees and other kind of degrees.

Studies

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Studies carried out

- Scientific Degree — 14%
- Humanistic Degree — 48%
- Architectural Degree — 3%
- Motor Science Degree — 2%
- Economic and Business Management Degree — 2%
- High School Diploma — 31%
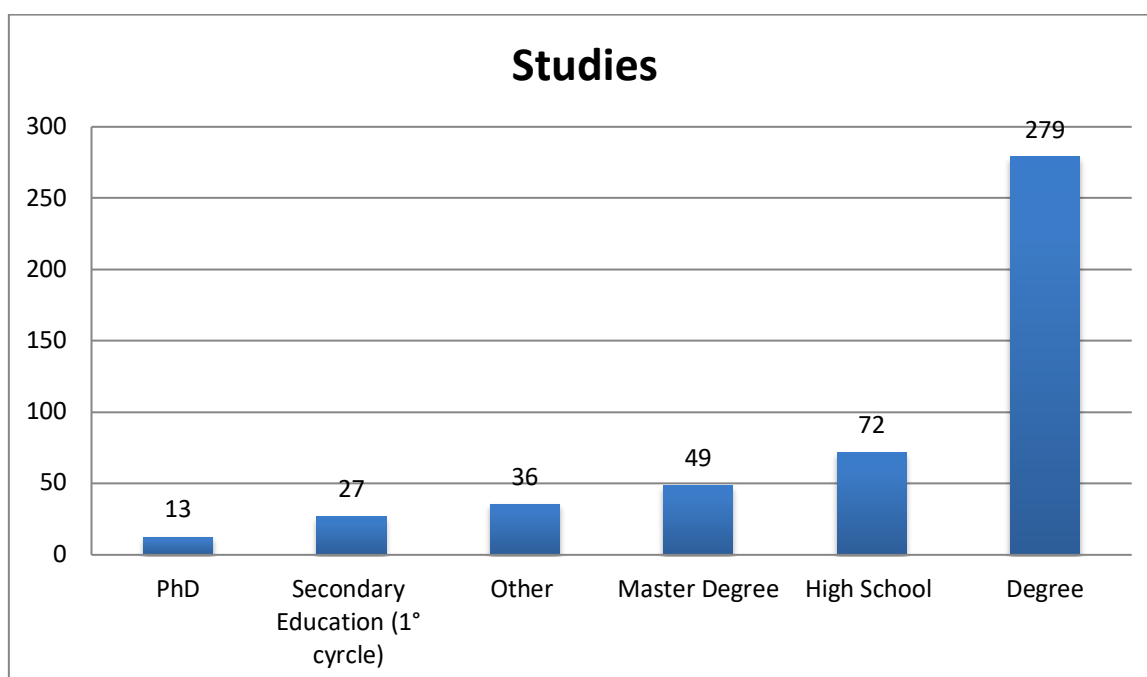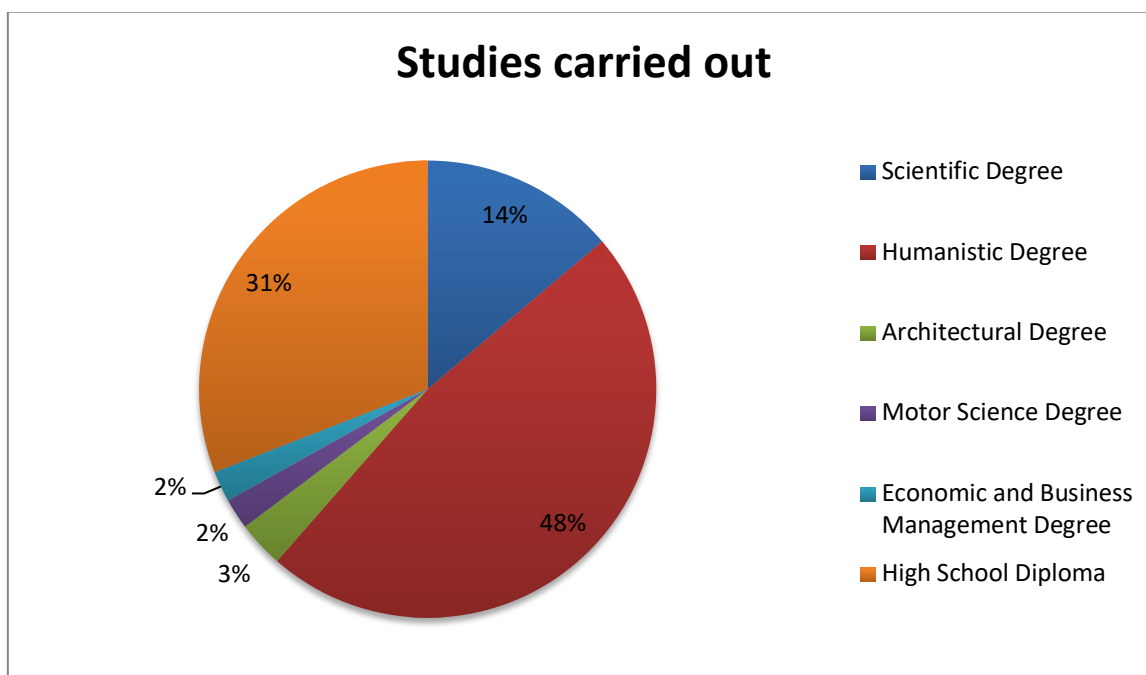
The sample is composed almost entirely by teachers, with a small percentage of special needs teachers/educators, and school principals.

Job

- HeadMaster: 3
- Educator: 2
- Teacher: 437
- Special Needs Teacher: 29
- Vice-Headmaster: 5

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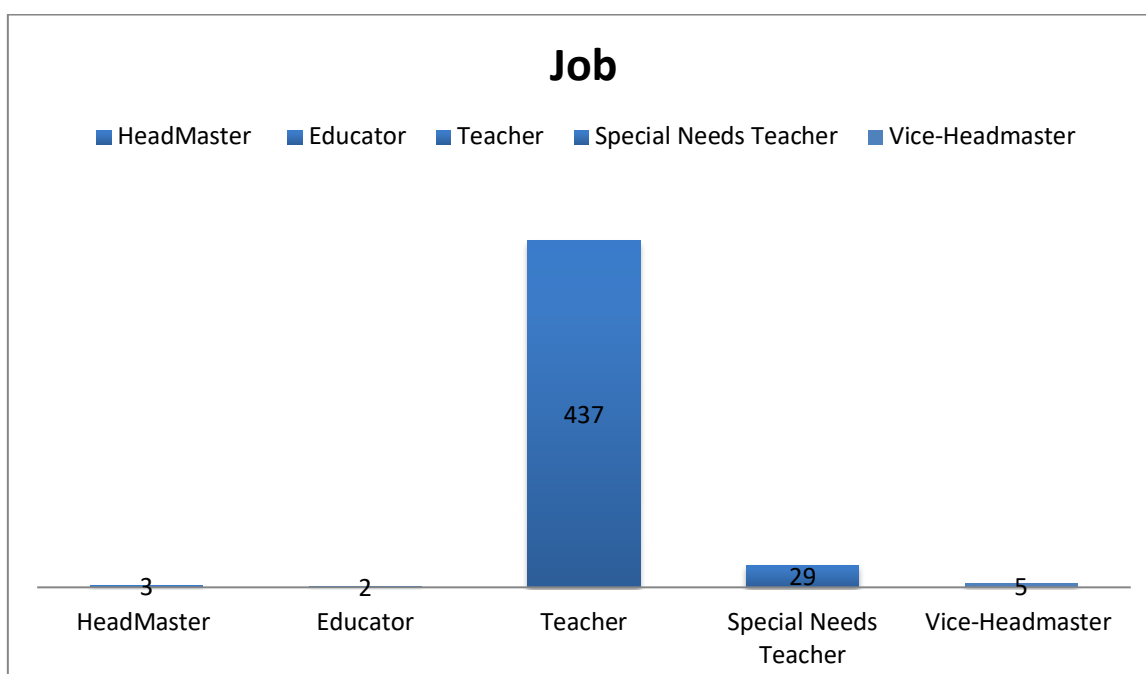
All levels of compulsory education are represented, with 38% of respondents working in primary schools, 26% in middle schools, and 33% in different kinds of secondary schools.

School level
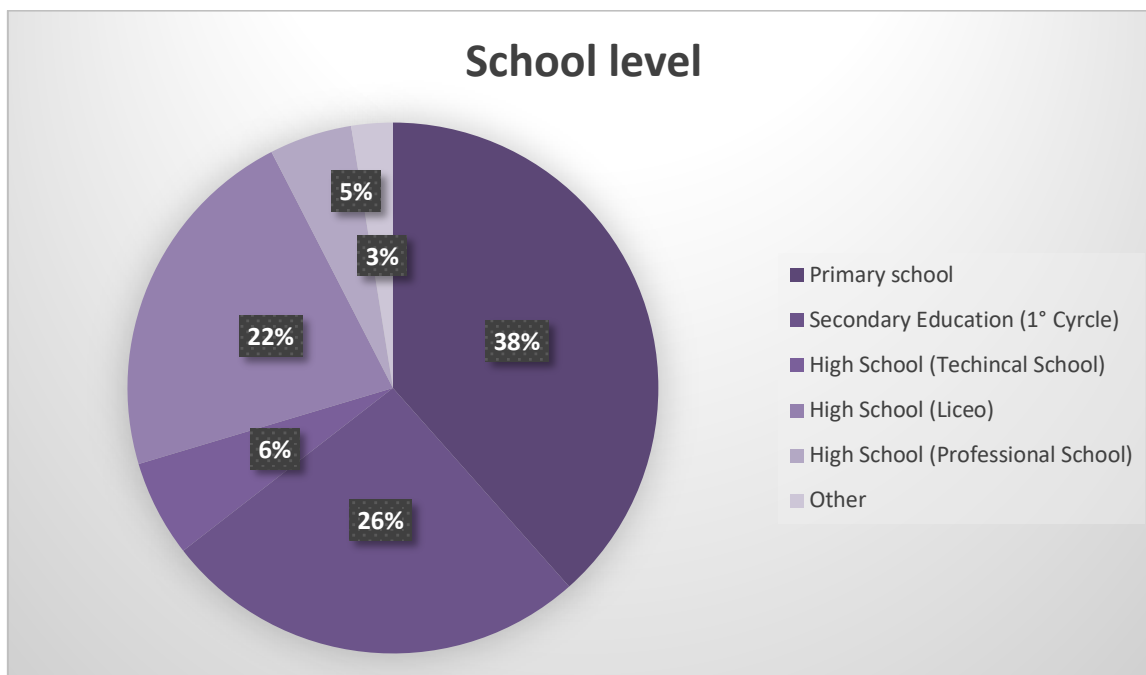
The subject taught include Italian language and literature (32%), history (25%), mathematics (22%), geography (19%), science (18%), art/music (17%), foreign language (16%), physical education (9%), philosophy (7%), religion (3%), and ICT (2%).

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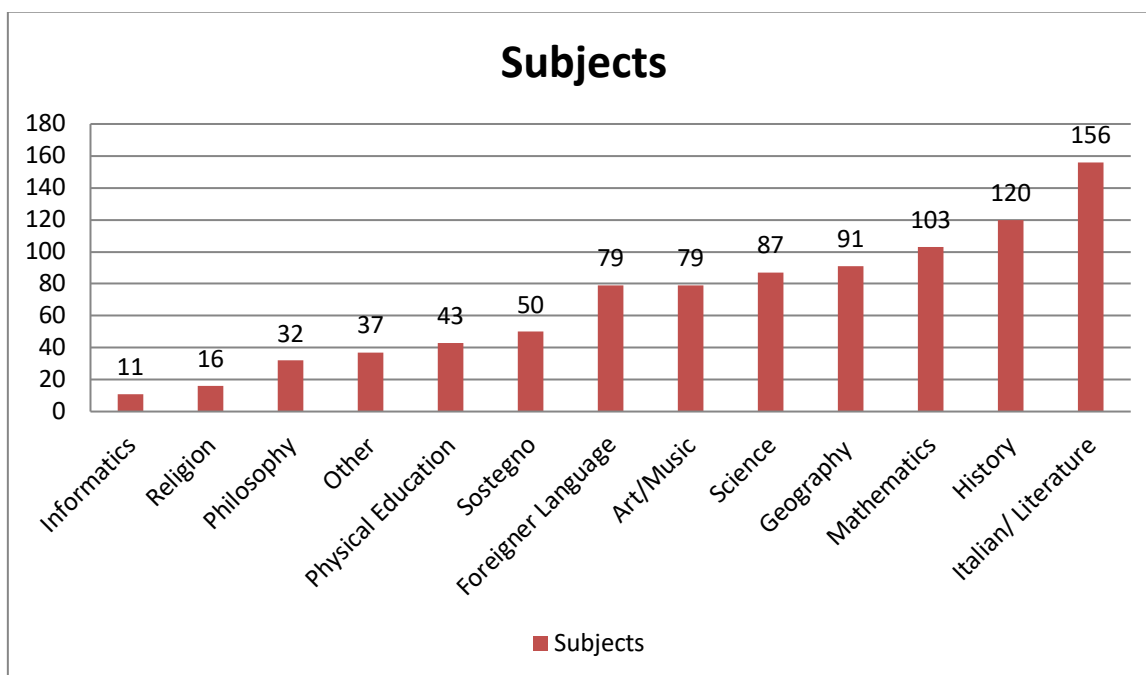
The 7,4% of interviewed teachers is a member of the "Innovation team," while the 2,9% have the role of being "digital promoter" in their school [17].

The questionnaire investigated the use of different media channels among the sample, with a specific focus on the strategies of news collection and the use of the social network. As it is possible to see, the sample is highly variable in the

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[17] According to action number 28 of the Italian National Digital School Plan - *Piano Nazionale Scuola Digitale* (PNSD) –, every educational institution must be equipped with a new figure in its staff, the Digital Animator (DA) – (*Animatore Digitale*). The Digital Animator is a teacher that should have digital competencies to support the schools and their staff members - as well as students and their families - with the implementation and adoption of innovative policies. Another task of the Digital Animator is to assist the school headmaster in the digital transformation of the schools and in promoting and planning different action areas to cover the different actions of the PNSD. As we can imagine, in order to lead the educational institutions efficiently, this figure must have excellent skills in the digital environment and didactic planning activity, as well a good leadership. For this reason, MIUR has established a set of training course to support the activities of the Digital Animator, also because one of the main obstacles of a proper implementation of the Plan regards teachers training and their low level about digital competences, especially for the teachers in advantage stage in their careers (Forlizzi, 2017; PNSD). In this respect, the PNSD provides funding for training activities.
In Action number 25, the Plan provides the implementation of the Digital Innovation Team - a group made up of three teachers, two administrative assistants, and one ATA staff member. The Digital Innovation Team has the function to support and accompany the activities held by the Digital Animator and, in general, of monitoring the didactical innovation in each educational institution. These two figures should represent a mediator between the school system and the digital challenge.

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choices of primary sources of information, with 20% not using television news, and little more than 60% reading online news, while the scouting for news on social networks is reported by almost 40% of the respondents.

Combining the number of respondents using online newspapers and SNS to get news is possible to divide the sample into respondents who do not search online for news (27%), respondents who use at least one online source of info (44%) and respondents who use two or more online sources of information (29%).

Main sources of information

Source	Yes	No
TV News	376	100
Daily Newspapers Online	299	177
Daily Newspapers	218	258
Radio	196	280
Social network	187	289
Newspapers	165	311
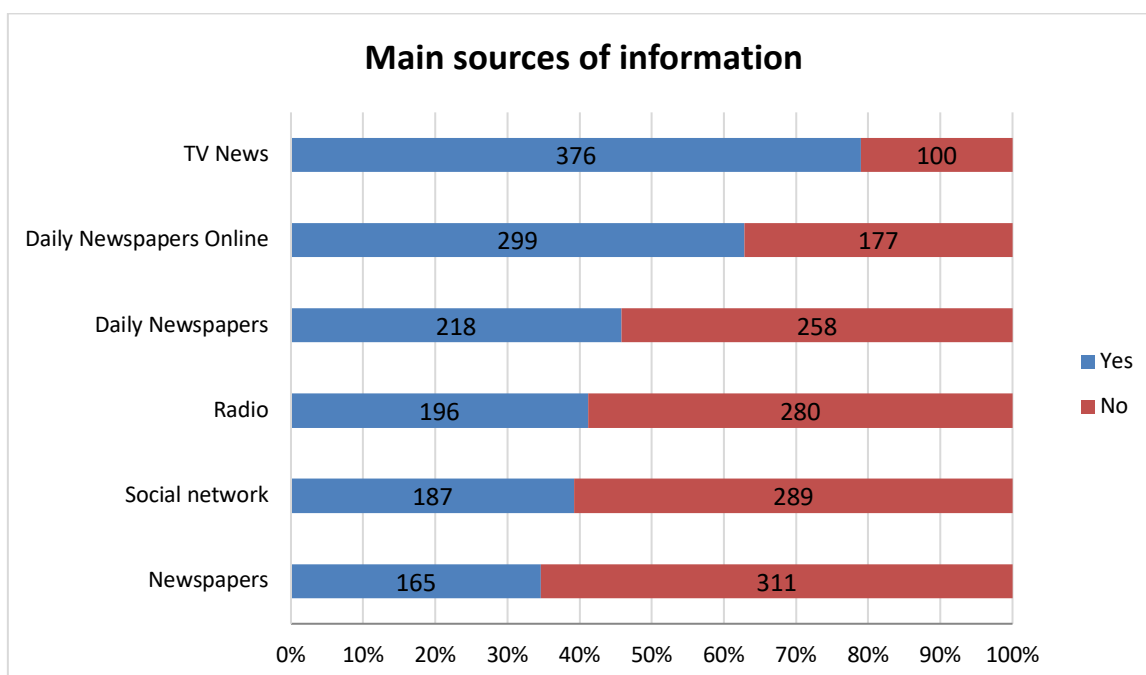
The use of tools for ICT communication is not so widespread, and even less is that of Social Networks. Once again, combining the answers to the different items is possible to see that 34% of the sample does not use any social network, 31% uses one social network, and the remaining 35% uses two or more of them.

Number of social network sites used (%)
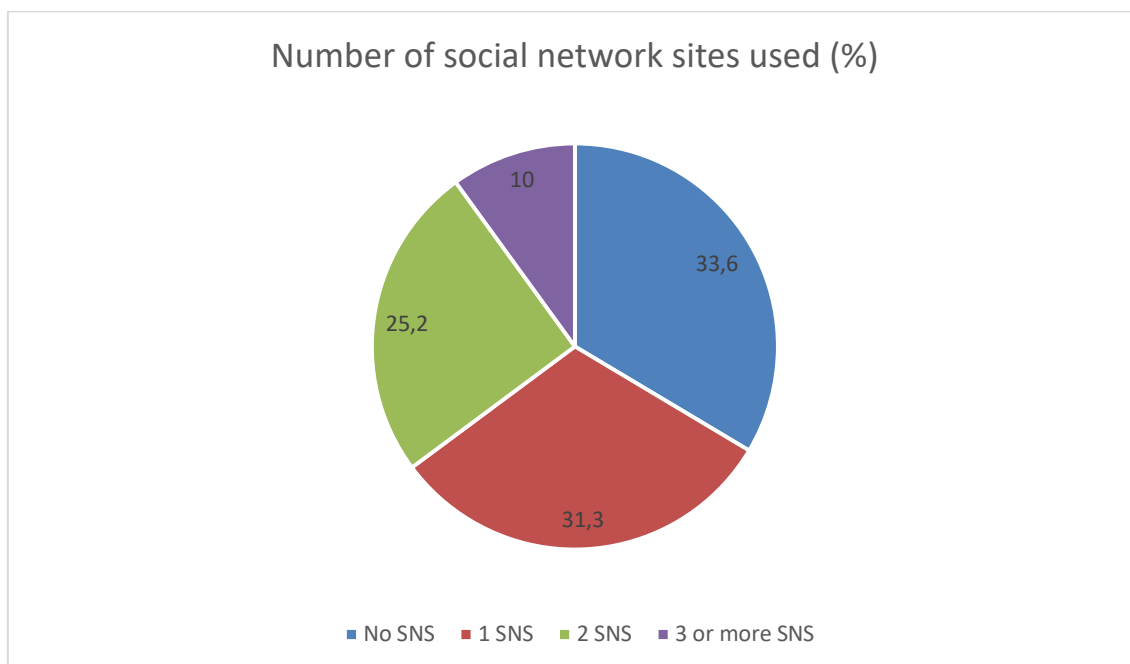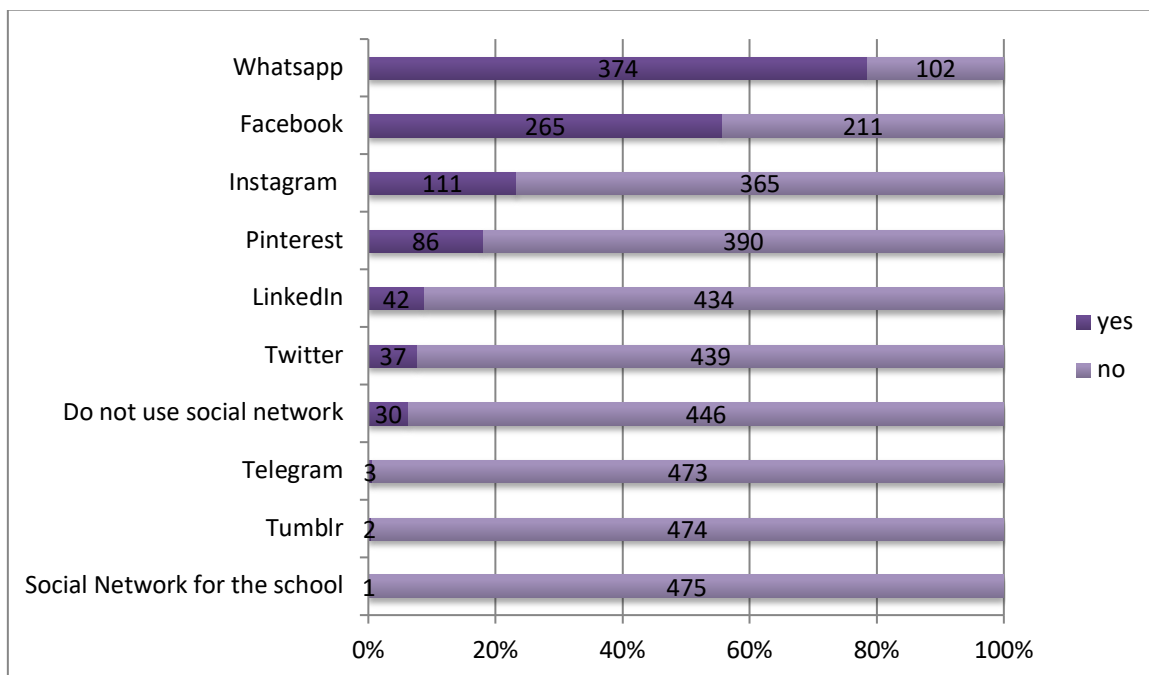
9.2 EDUCATIONAL ICT SELF-CONFIDENCE

The first scale focused on the study of the relationship teachers perceived to have with ICT and their use within classes.

Teachers were asked to rate their level of agreement with the affirmations proposed on a Likert scale going from 1 (strongly disagree) to 10 (strongly agree).

Item	Mean	SD
1. I can support pupils in the managing and critical understanding of information gained via ICT	7,11	2,038
2. I am able to support pupils to communicate with ICT in a safe, responsible and effective way	7,11	2,106
3. I am able to support pupils to work together with ICT	7,03	2,1
4. I am able to stimulate pupils to use ICT in a critical manner	7,21	2,045
5. I am able to offer pupils opportunities to express ideas in a creative way by means of ICT	6,88	2,15
6. I am able to select ICT applications in view of a specific educational setting	6,63	2,169
7. I am able to use ICT appropriately to communicate with pupils and their families	7,12	2,25

Overall, it is possible to notice how teachers gave themselves a good evaluation (around 7 on a scale from 1 to 10). This is a clue to detect that, on average, the perception that teachers have of their ICT skills is quite high. The lowest means refer to point 6 (I am able to select the digital functions most suitable for a specific educational setting) and 5 (I am able to offer students the opportunity to express ideas creatively through the use of ICT) while the highest value is found in item 4 (I am able to stimulate pupils to use ICT critically).

In general, the answers obtained in this section can be considered substantially uniform to each other, as shown in the following graph:
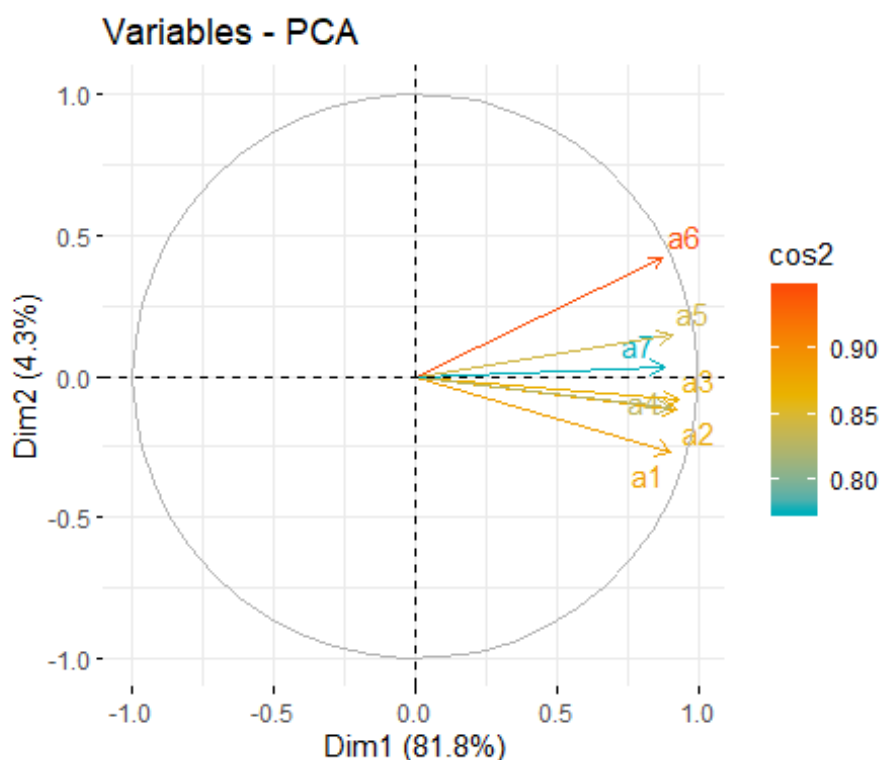
In this graph, we can see how the information contained in each item relates to one another. All the arrows are mostly horizontal and go to the right, which means that all items contain very similar information. In this case, the higher the score chosen by subject, the more the subject wanted to say that he felt confident in the use of ICT. The dim1 alone explains more than 80% of the variance and therefore explains more than 80% of the information contained in the questions. All the questions ask for similar things, and therefore gave us similar answers, so in the analysis it is possible to summarize them all in a single principal component explaining almost all the information obtained from the battery.

The data can then be resumed on a scale that will measure the educational ICT confidence of teachers in one single value.

The following step consisted in the running of exploratory factor analysis, to confirm the existence of one main factor underlying the variance of the items. The

analysis shows the presence of a single factor that explains 81.77% of the variance with good saturations for all the items (module> .880).

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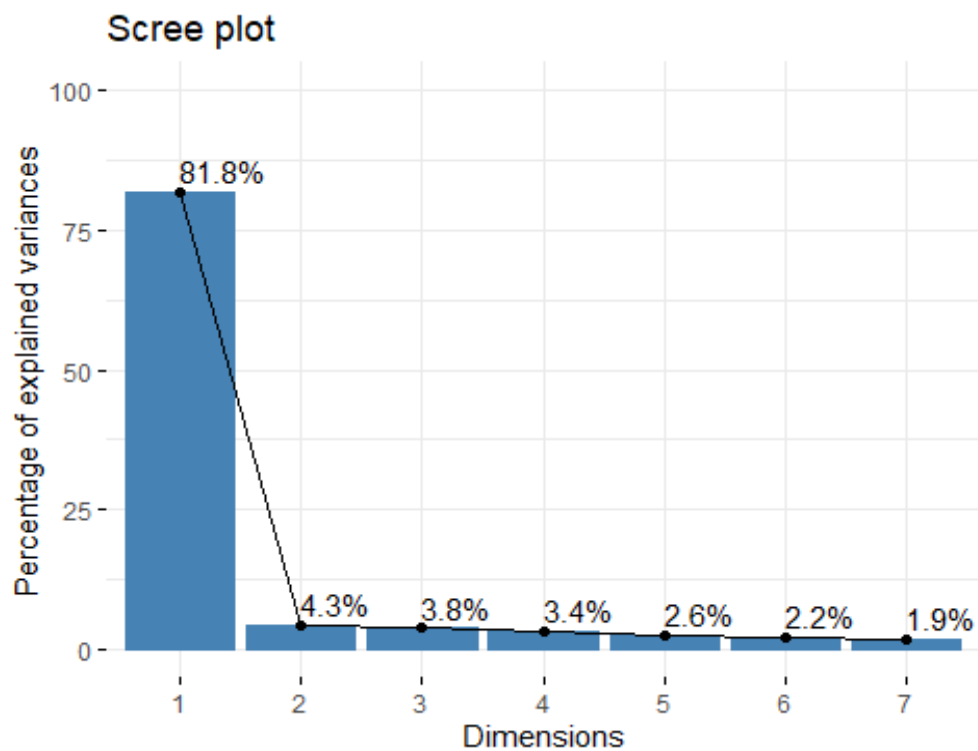
Total variance explained

| Component | Initial eigenvalues | | | Extraction sum of squared loadings | | Extraction sum of squared loadings |
	Total	% of variance	% cumulative	Total	% of variance	% of variance
1	5,724	81,765	81,765	5,724	81,765	81,765
2	,302	4,320	86,086			
3	,268	3,830	89,916			
4	,237	3,382	93,298			
5	,181	2,584	95,882			
6	,152	2,170	98,052			
7	,136	1,948	100,000			

Also, the test of internal consistency gives a reliable result (Cronbach alpha = ,962). Therefore, the items are added up to create a scale of **Educational ICT self-confidence.**

The scale created goes form 7 = extremely low level of self-confidence in the use of ICT for education to 70 = extremely high level of self-confidence in the use of ICT, with a mean of 49 and a standard deviation of 13.
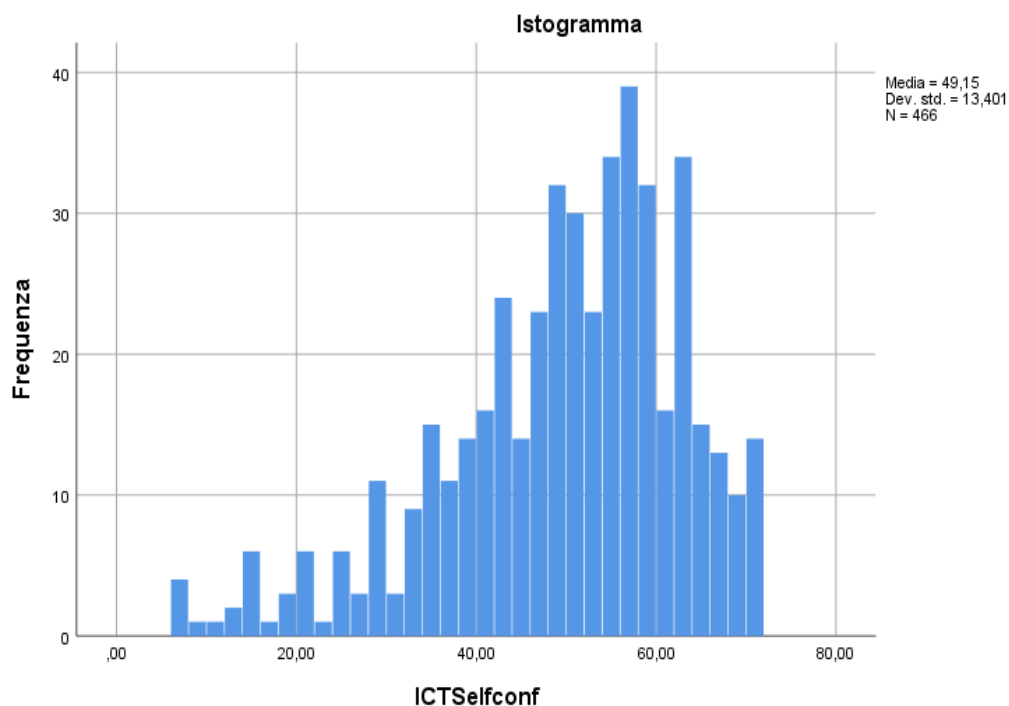
The distribution observed in the histogram confirms teachers consider themselves quite skilled in the use of ICT. Also, as we already said, for this scale, there is no significant difference in the average level of confidence between respondents that answered the questionnaire online or on paper, as we can see also in the data plotted in the PC (Principal Component) space.
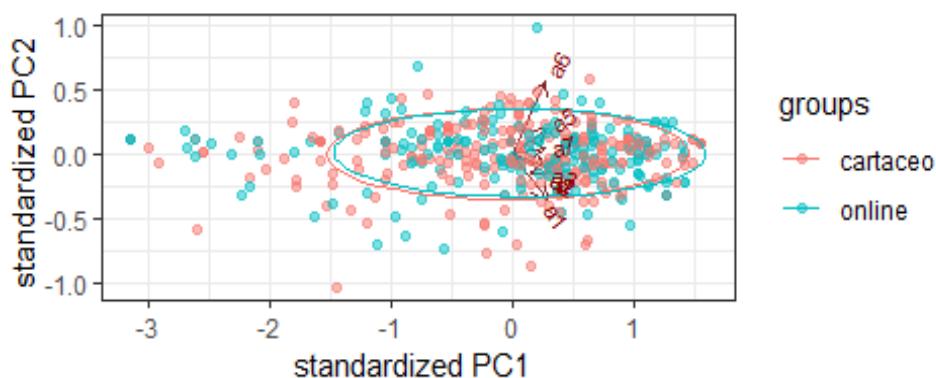
9.3 INFORMATION AND MEDIA

Although the subject appears far from the scholastic context, the opinion of the teachers on it was compact. As shown by the means of the majority of items (around 8), we can imagine a scenario in which press, and therefore the media, is not perceived as neutral. However, as invoked in item b10, many subjects remarked that while the main goal of a journalist should be reporting the truth, this is often forfeited in favour of more shocking, sensationalistic headlines. Item b10 plainly stated that the first duty of a journalist is to respect the truth and, on average, obtained the highest score of the battery (9.6). However, in the paper questionnaires, many teachers corrected this item, rewriting that "a journalist's first duty *should* be to respect the truth." This means that this answer triggers the ethical sense of the person. At the same time, the corrections and comments collected in the validation phase bring us back to a form of skepticism towards the actual media's ability to maintain that same ethical sense.

Following is a summary table that indicates the average of the evaluations of the interviewees on each sentence submitted and the level of differences in the opinions expressed through the standard deviation (SD).

Item	Mean	SD
B1) The owners of the publishing groups influence the content	8,01	1,717
B2) Publishers choose which news to publish based on what will attract the most people	8,32	1,601
B3) People can find sources of information that reflect their political values	7,71	1,741
B4) People pay more attention to news that is in accordance with their beliefs than to those that differ from them	7,88	1,803
B5) Media coverage of a political candidate influences people's opinion	8,24	1,610
B6) News is built to attract the attention of the public	8,66	1,460
B7) The media show facts more dramatically than they really are	7,90	1,711
B8) News with a good photograph is more likely to appear in the information channels	8,58	1,377
B9) A story about a conflict is more likely to receive high media exposure	8,12	1,640
B10) The first duty of a journalist is to respect the truth	9,55	1,163

The lowest value of all the answers is in item B3 (People can find sources of information that reflect their political values) with an average of 7.71.

9.4 TEACHERS AND FAKE NEWS

In order to evaluate the role that the school can play in contrasting the effect of fake news, firstly we believe it was fundamental to evaluate the level of the awareness and the representations of the teaching staff.

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9.4.1 Defining what a fake news is

As we can see from these answers, the definitions on which the teachers find themselves most in agreement with are the C1 (the intention to deceive the reader voluntarily) which presents an average of 8.54 and C4 (the deceiving statement appearing as real news), with an average of 8.53. In both cases, as can be seen from the low value of the standard variation, the answers are generally uniform. We found that the most diversified and discordant opinions in the C7 item, stating that a fake news, to be defined as such, must have been written by incompetent people (SD 2.817 and average 5.30) and in item C11, claiming that a fake news would be irrelevant news (SD 2.266 and average 5.97). Following is a summary table that indicates the average of the evaluations of the interviewees on each sentence submitted and the level of differences in the opinions expressed through the standard deviation (SD).

Item	Mean	SD
C1) The intention to deliberately deceive the reader	8,54	1,795
C2) The intention to move public opinion for the benefit of something/someone	8,38	1,684
C3) The fact of traveling mainly through the internet	7,78	2,008
C4) The fact of appearing as real news	8,53	1,579
C5) The fact of being publicized to gain "clicks"	8,35	1,823
C6) The fact to have at least a part of the truth	6,28	2,367
C7) To be written by incompetent people	5,30	2,817
C8) Not having verifiable sources	7,55	2,473
C9) To be distributed by a specific newspaper or online portal	6,63	2,271

C10) Intention to manipulate people	8,29	1,826
C11) Irrelevant news	5,97	2,626
C12) Fabricated news	7,66	2,266
C13) Untrue news, to which one must pay attention	8,00	2,183
C14) Untrue news disseminated with the purpose of disinformation	8,22	1,864

The pattern of answers in this scale is consistently different from the one registered in the previous sets and shows the presence of opinions much more variated in the sample.

Such differences are well represented also in the PCA graphic, were we can notice a significant spread in the arrows with different lengths and orientations for every item. This means that even if the different items belong to different definitions, they convey similar information. They all point to the right of the graphic, but at the same time, they also contribute in different ways to the significance of different principal components because the pieces of information that they carry are not enough to build a single dominant principal component like in scale A.
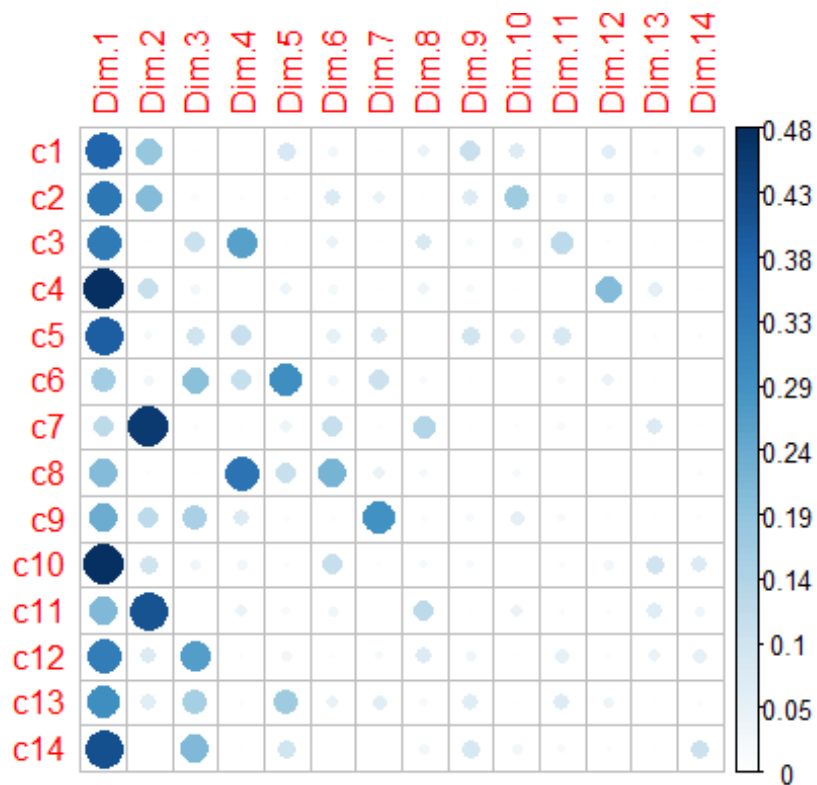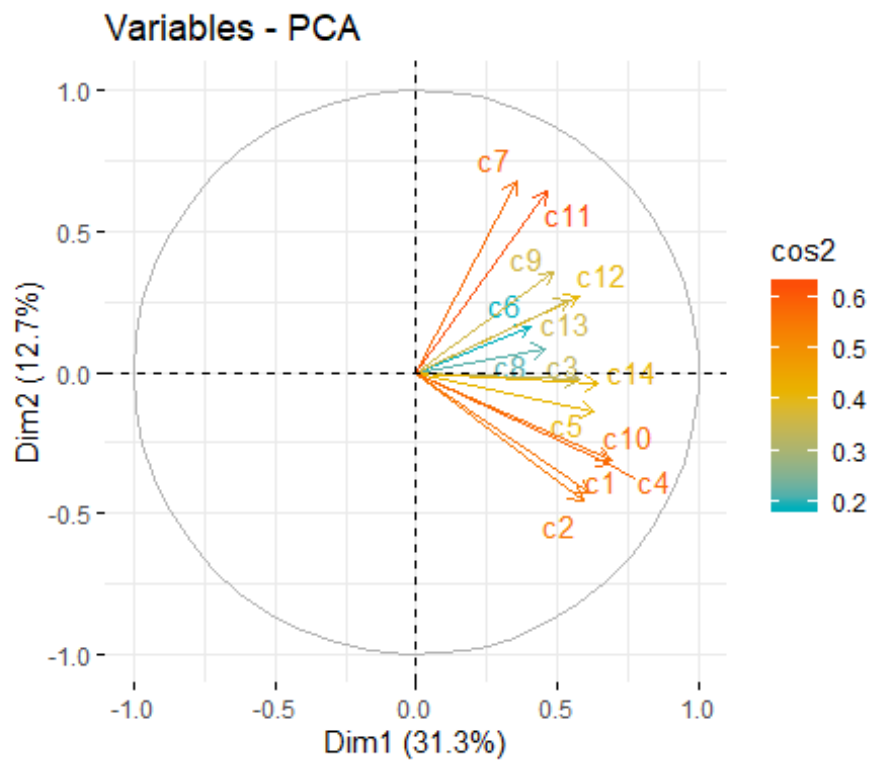
Here, we can see how every item contributes in a different way to every principal component. Items c1 to c5, c10, c12, c13, and c14 contribute mainly to Dim1; items c7, and c11 are more separated from the others and compose Dim2. Finally, items c6, c8, and c9 are the most independent ones.
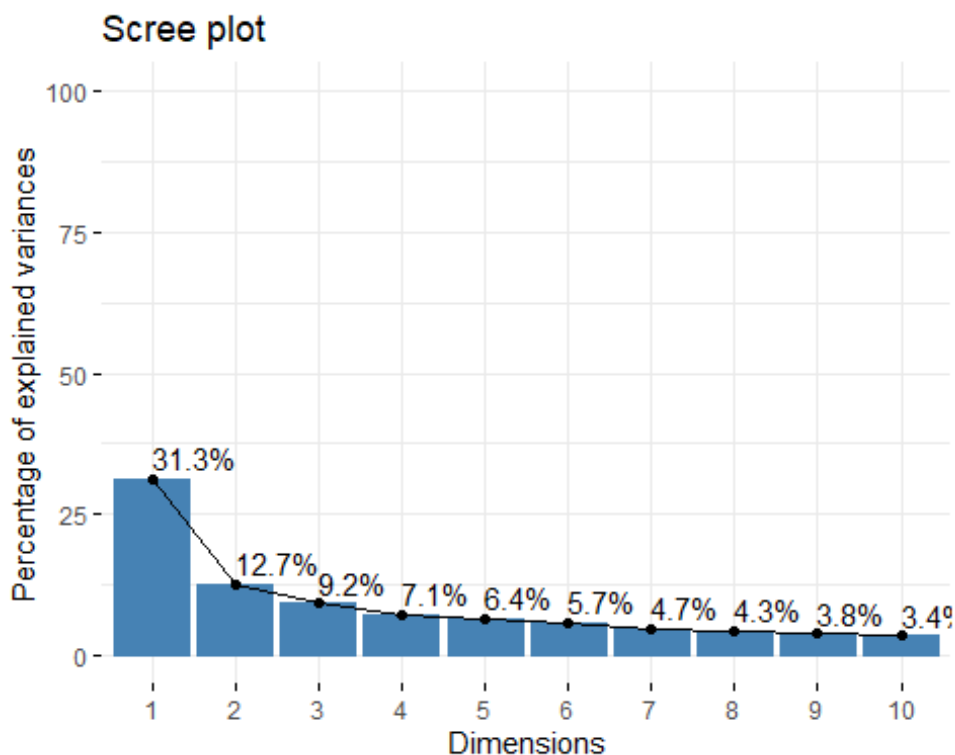
As evidence of what we have just highlighted, we can see that the first two principal components combined explain less then 50% of the variance, and are therefore not particularly useful in describing the battery of questions because the scale cannot be synthesized in just two main components. However, as already mentioned above, this is not considered negatively, since the items were specifically chosen to be different from each other and give teachers more options to be evaluated.

This part of the questionnaire also included an open question where other relevant features could be added to define fake news.

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Among those listed, the most interesting aspect is the impact of fake news on the public. In particular, how fake news can manipulate the opinions of the users "without a critical spirit of their own and without the tools to evaluate the news and questioning it with the search for other sources". Another aspect highlighted is how this type of news is "plausible and sensationalistic," or how often they are related to aspects that have had repercussions on public opinion, "leveraging on the human emotional component [...]. Consequently, they can manipulate users without a critical spirit and without the tools to evaluate the news and question it with the search for other sources". One last point mentioned concerns the purpose of fake news, often related to political ends.

9.4.2 The fake news self-confidence scale

In this scale, items D1, D3, D6, D7, D8, and D9 concern the degree of awareness that the teachers feel to have, both as individuals and as educators, in distinguishing and explaining what fake news is.

The remaining items, D2, D4, and D5, were related to the experiences of the teachers with fake news.

The table below summarizes the mean and standard deviation for each item:

Item	Means	SD
D1) I think I'm perfectly able to distinguish a real news from a fake news	6,82	1,81
D2) I have often had doubts about the truthfulness of a news item (is it true? is it fake...?)	7,53	1,948
D3) If I have doubts about the truthfulness of news I know how to verify it	7,48	1,953
D4) I happened to believe to a news and find out that it was fake	6,25	2,467
D5) I happened to think that a news was fake and then find out that it was real	6,02	2,386
D6) I can easily explain to my students what a fake news is	7,73	1,969
D7) I think I'm able to prepare my students to recognize fake news and not be misled by it	6,87	2,046

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D8) If any of my students believed in a fake news, I would be able to make them understand his/her error	7,19	1,976
D9) I have developed a strategy to teach students how to recognize fake news	5,46	2,462

Overall, through these items the sample showed a lower level of self-confidence than the one expressed when measuring the more generic educational ICT self-confidence.

As can be seen from the data, the aspects on which the teachers seem to be more confident are the point D6, their ability to explain to the students what a fake news is (mean 7,73), and the point D3, the confidence in being able to verify the truth of a news story in case of doubts about its nature (mean 7,48). Teachers also agree with statement D2, (mean 7,53), affirming to have had doubts about the truth of the news.

The aspect where they seem most insecure regards the possible strategies developed to teach students how to recognize fake news (mean 5.46; item D9) and if they had ever thought of news as fake and then discover they were real (mean 6.02; item D5). Furthermore, in both points, the opinions are less uniform than the others, which means that the teachers have provided less homogeneous answers.

Set D: Fake news self-confidence

The exploratory factor analysis run on the items of this battery highlights the presence of two main factors, explaining 66,7% of the total variance. Factor 1 contains items 1, 3, 6, 7, 8 and 9; it can be labelled as self-confidence in dealing with fake news as an educator. Factor 2 include item 2, 4 and 5; it was labelled as evaluation of actual experiences with fake news

Grafico scree
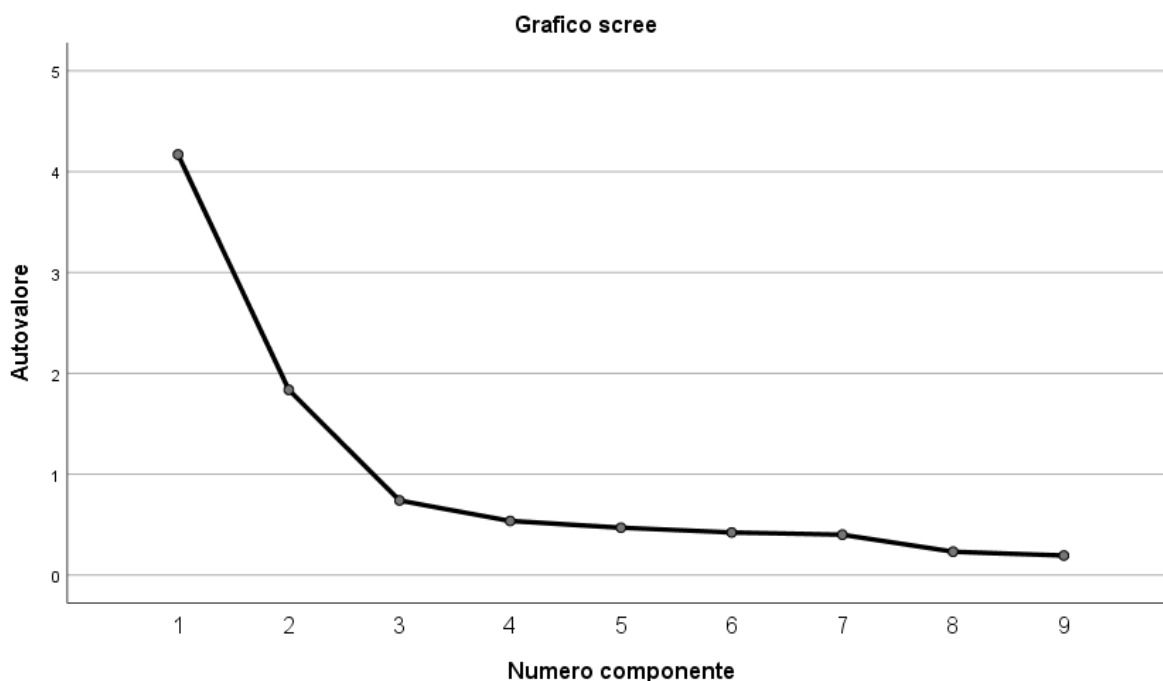
Rotated component matrix[a]

	Component	
	1	2
d1	**,796**	-,064
d2	,185	**,662**
d3	**,784**	,000
d4	-,101	**,846**
d5	,076	**,828**
d6	**,795**	,230
d7	**,907**	,044
d8	**,899**	,082
d9	**,725**	,115

The items loading on factor 1 are combined to create a scale of "fake news self-confidence". The value for internal consistency is extremely high: Cronbach alpha = ,900.

The fake news self-confidence scale goes from 6 (extremely low level of self-confidence in the ability to deal with fake news and support the students in facing them) to 60 (extremely high level of self-confidence). The mean value is 41,55, and the standard deviation is 10.

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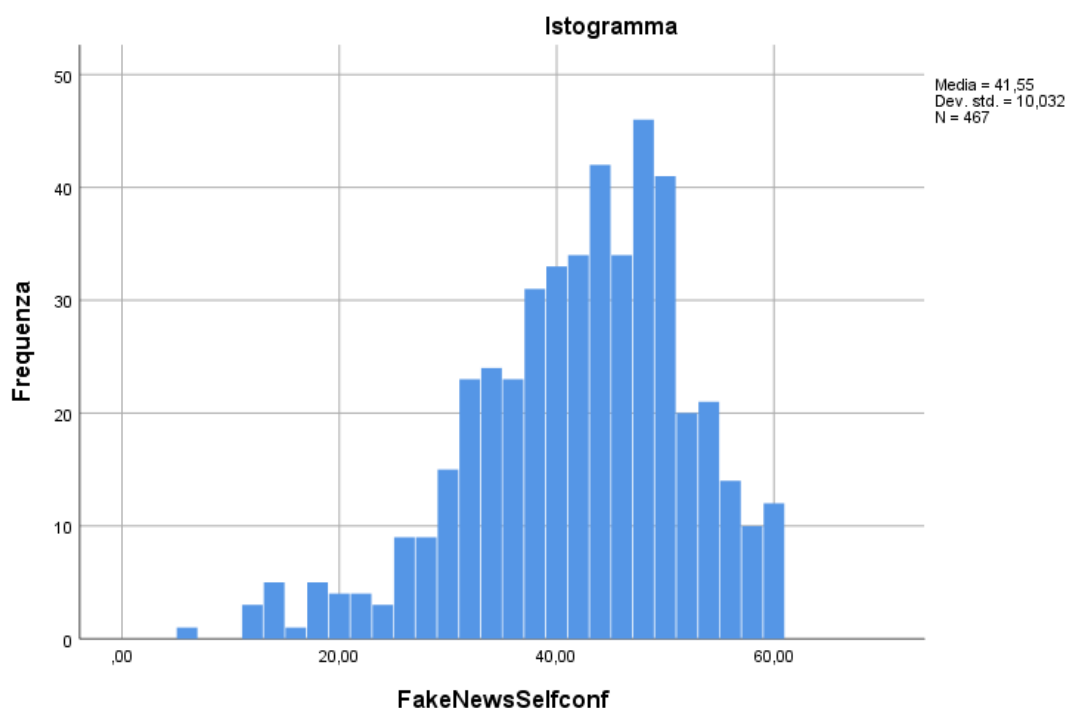
The scale shows a slight negative correlation with age (fake news confidence of the respondents increases as the age decrease) and a strong positive correlation with the ICT self-confidence (fake news self-confidence increases as ICT self-confidence increase).

Items d2, d4, and d5 will be analysed separately because, although the internal consistency of a scale unifying them is acceptable, we consider it interesting to keep the information of each item visible.

9.5 FAKE NEWS AND EDUCATION

In this session of the questionnaire, teachers were asked to reflect on the role that the school system could have about the prevention and contrast of fake news.

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9.5.1 Educational strategies to contrast fake news

The first relevant aspect that emerges from this scale is that fake news is an issue very relevant for the students.

Let us look at the summary table below with the averages and uniformities of each statement:

Item	Means	SD
E1) Providing training to teachers in-service and first started on relevant topics to conscious use of the web	8,04	2,076
E2) Structuring specific and fixed didactic paths for each subject that aim at the development of critical thinking skills of the students	8,08	2,065
E3) Strengthening students' basic culture (history, mathematics, Italian...)	8,42	1,787
E4) Promote specific spaces at school for the development of critical thinking for students of all ages	8,45	1,836
E5) Strengthening students computer skills	7,73	2,085
E6) Restrict students access to social networks	6,25	2,940
E7) Increase parental supervision of the information that students receive	8,25	1,951
E8) Changing students evaluation systems, shifting them from knowledge of content to the ability to remodel them according to one's own experience	7,01	2,456
E9) I don't think that fake news is a problem that touches students closely	3,65	2,824

The mean average is very high for promoting specific spaces to develop critical thinking at school (8,45), reinforce general culture (8,42) and increase the level of parents' supervision on their children's information access (8,25).

As we can see, the most popular strategies include both constructive and controlling actions. Teachers also agree on the necessity, for them, to receive specific training on the judicious and safe use of the internet.

The lowest agreement is registered on the option that suggests limiting students' access to social networks.

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The "constructive strategies scale"

Exploratory factor analysis is run to highlight the internal structure of the variables. Two main factors seem to emerge, together explaining 54,6% of total variance.

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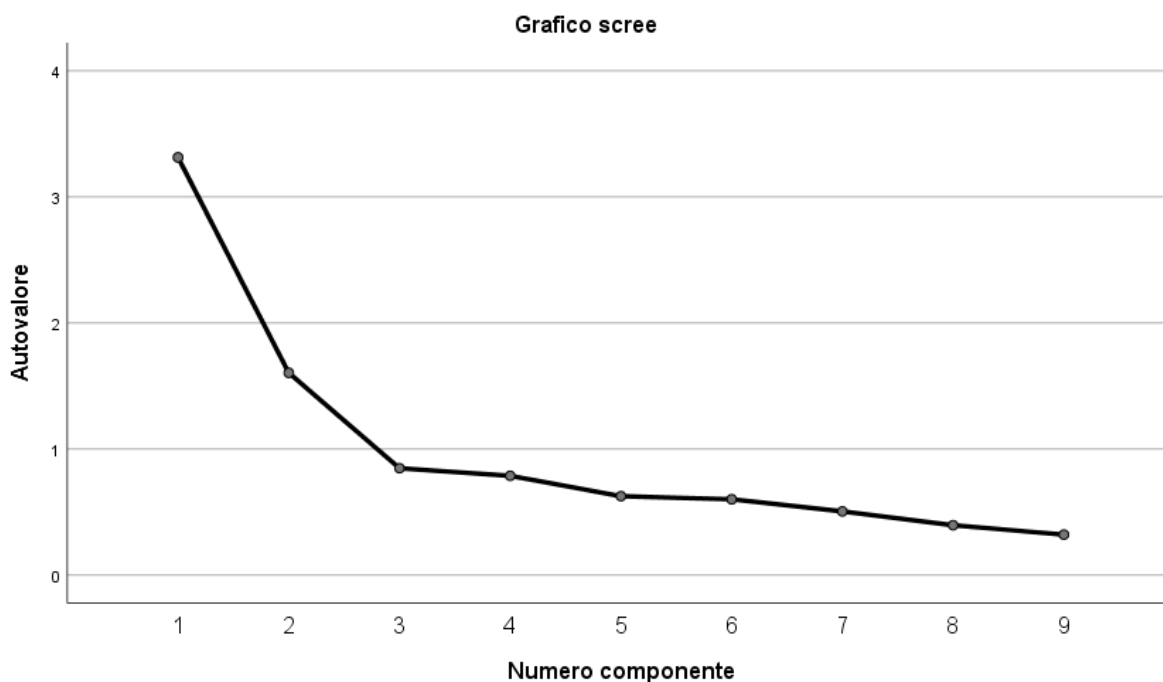
However, further analysis suggests the necessity to exclude item 8 (the one referring to the need to modify the testing and evaluation strategies of the students). The analysis of the rotated component matrix allows identifying factor 1 as the one related to "constructive strategies" and factor 2 as the one related to "protective strategies."

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Rotated component matrix

	Componente	
	1	2
e1	**,747**	-,165
e1	**,803**	,010
e3	**,676**	,098
e4	**,780**	,005
e5	**,691**	,235
e6	,112	**,859**
e7	,452	,624
e9	-,237	**,668**

Extraction method: Analysis of the main components.
Rotation method: Varimax with Kaiser normalization.
a. Convergence for rotation performed in 3 iterations.

Therefore, the first five items are merged to compose a scale measuring the propensity to support the students adopting **constructive** and effecting strategies. The internal consistency of the scale is good, with a Cronbach alpha of ,801. The scale goes from 5 to 50, where 5 indicates the lowest level of interest in constructive strategies and 50 the highest. The scale has a mean of 40,7 and a standard deviation of 7,3. The sample share in quite a compact way a very positive attitude towards constructive strategies.
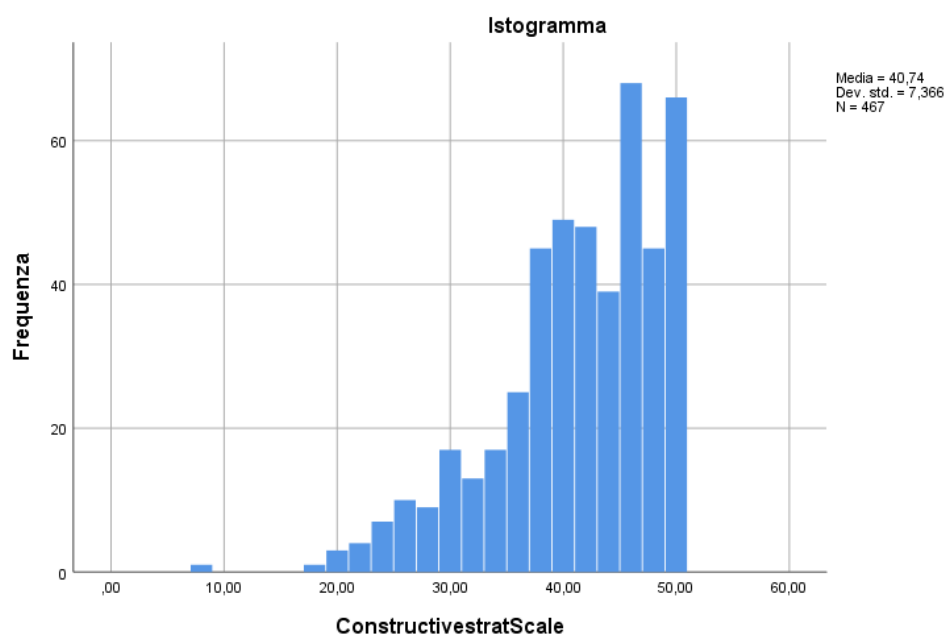
The scale shows a moderate/strong correlation with the item 7 (increase parents' surveillance on their children's access to information), and very slight negative correlation with items 6 (reduce children's access to social networks), and 9 (I don't think that fake news is a relevant problem for my students). This means lower levels on the constructive scale do no associate strongly with a higher level of preference for the other two items, as it could have been expected.

Item 6, however, shows a strong correlation with item 7 and a moderate one with item 9.

Correlations

		Constructivest ratScale	e6	e7	e9
ConstructivestratScale	Pearson correlation	1	,141**	,391**	-,108*
	Sign. (a due code)		,002	,000	,020
	N	467	463	464	466
e6	Pearson correlation	,141**	1	,505**	,348**
	Sign. (a due code)	,002		,000	,000
	N	463	467	466	467
e7	Pearson correlation	,391**	,505**	1	,059
	Sign. (a due code)	,000	,000		,206

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	N	464	466	468	468
e9	Pearson correlation	-,108*	,348**	,059	1
	Sign. (a due code)	,020	,000	,206	
	N	466	467	468	470

**. The correlation is significant at level 0.01 (two-tailed).

*. The correlation is significant at level 0.05 (two-tailed).

9.5.2 Role of the school in contrasting fake news

In this set of items, we can evaluate the teacher's opinion on the role that school should play in the education of students on the subject of fake news.

Below there is a table with a summary of the averages and uniformity of the answers given for each sentence:

Item	Means	SD
F1) To leave freedom to teachers to approach the teaching of critical thinking as they like	7,15	2,293
F2) Oblige teachers to adopt school textbooks that include the use of critical/reflective faculties by students	5,26	2,765
F3) The school does not have the time and resources to deal with the problem of fake news	4,55	2,878
F4) It is necessary to change the school programs, reserving adequate space and time for the contrast of fake news	4,85	2,517
F5) The responsibility for defining learning units on this topic should be entrusted to a specific teacher for each class	4,79	2,780
F6) The digital innovation team is the right tool to start contrast and response initiatives	6,26	2,343
F7) Periodically administer tests that measure students critical thinking skills, at national and transnational level	5,64	2,777
F8) Rethink the entire national school system according to the digitization of the school	5,91	2,741

On a first, overall evaluation is possible to see that, compared to the previous scales, this set of items presents answers less uniform with each other and with lower mean values. According to the answers provided, a consistent uncertainty emerges about the various measures that the school system could take in

education against fake news. From the collected data, we can deduce a tendency to oppose a hypothetical change within the school system: the teachers do not seem inclined to adopt compulsory new school texts (item F2; mean = 5,26), or to change school programs, reserving time dedicated to the contrast of fake news (item F5; mean = 4,79). They also appear not to be inclined to periodically administer tests to measure the critical thinking capacity of their students (item F7; mean = 5,64), as well as to review the national school system according to the digitization of the school (item F8; mean = 5,91). In addition to presenting a rather low mean, these points indicate a divergence in the answers provided. The point on which the teachers are most in agreement turns out to be the option of allowing teachers to have more freedom to face the teaching of critical thinking as they see fit (item F1; mean = 7,15). On one hand, the interviewees seem to be opposed to a transformation of the current school system; on the other, they seem to be more favourable to greater freedom in the teaching itself. Despite the slightly different answers, many teachers have expressed their disagreement on the F3 point, namely that the school does not have the time and resources to deal with the fake news problem.

9.5.3 A scenario of fake news disrupting lesson

The respondents were asked to read this short story and try to identify with the protagonist:

"During a discussion in class, a student reports having read a piece of terrible news online: some migrants would have attacked and beat up a disabled Italian boy, breaking his leg.

The news has very uncertain sources but triggers a conflict between the students".

HOW DO YOU FEEL?

In the first part of this section, a series of adjectives were given, indicating how each teacher could have felt about it. Teachers could respond through a scale of 1 to 5, of which 1 indicated "strongly disagree" and 5 "strongly in agreement."

		Mean	DS
h1	Intrigued	2,9	1,376
h2	Worried	3,54	1,32
h3	Anxious	2,37	1,287
h4	Unprepared	2,28	1,214
h5	Angry	2,55	1,36
h6	Stimulated	3,32	1,287
h7	Bored	1,46	0,921
h8	Shocked	2,83	1,391
h9	Doubtful	3,29	1,387
h10	Insecure	2,04	1,137
h11	Scared	2,00	1,208

As can be seen from the answers, most of the teachers feel worried about the hypothetical open debate that could emerge among the students (item h2; mean = 3.54). Other common emotions are doubts about how to act (item h9; mean = 3,29) and a feeling of being stimulated (item h6; mean = 3,32), and even a little curiosity (item h1; mean =2,9) and disconcert (item h8; mean = 2,83) about the addressed topic. Emotions that are not perceived as relevant are: boredom, fear, insecurity, anxiety.

In this part of the questionnaire, the teacher could add other possible emotions felt in the described situation. Even in open answers, the teachers confirm their interest in fostering dialogue between students. Most of the teachers would work to ascertain the sources together and read the news with their students, establishing a critical debate about the search for information and their

truthfulness. This aspect would stimulate the teachers to set up lessons based on the research for information and on how to use the sources.

A part of the teachers expressed indignation and irritation about the news itself: "towards those who show hatred" and against the "emergence of continuous stereotypes that negatively influence the work of [...] [inclusion] that we try to operate in a wide range in a class". A small group also used the words sadness, perplexity, and embarrassment. An aspect that emerged from a response of a teacher is his concern about the lack of protection that teachers would have, in a circumstance so delicate that could limit the teacher to expose himself on the topic.

ATTITUDE

In the second section of the scenario, the teachers were asked to express their attitudes in the described situation. As with the section evaluating emotions, also in this one, the interviewees were asked to evaluate - on a scale going from 1 "strongly disagree" to 5 "strongly agree" - the following sentences:

Items	Mean	DS
H13) I think that this kind of discussions should not take place in the classroom	1,62	1,053
H14) I think it's a great learning opportunity	3,98	1,089
H15) I think I'm not able to handle discussion of these issues	2,03	1,168
H16) I'm sceptical about news like this	2,67	1,274
H17) I think I have the skills to handle this kind of situation	3,77	1,014
H18) I'm very annoyed that this kind of news is being reported without knowing the source	3,85	1,189
H19) I think every student should be free to express their personal opinion about the news.	3,86	1,138

Overall, the low value of the standard variation among the items indicates a uniformity of answers.

Most of the teachers believe that the hypothetical situation described is an excellent learning opportunity, as can be seen in item 14 (mean = 3.98). Furthermore, the teachers agree that each student should be guaranteed the freedom to express their personal opinion on the news (item H19; mean = 3,86). At the same time, however, they are bothered by the fact that news of this type may be reported without having ascertained the source (item H18; mean = 3,85).

In general, they consider themselves capable of managing the situation (item H17; mean = 3,77). Moreover, many teachers oppose the assertion that this type of discussion should not take place in the classroom (item H13; mean = 1,62), and strongly disagree on not feeling able to manage the discussion of these issues (item H15; mean= 2,03).

As in the previous section, it was also possible to add further statements regarding this hypothetical situation.

It is also interesting to observe how, despite the presence of a part of teachers that would first verify the information sources as the first step towards a critical debate to promote dialogue between students, there is a substantial part of teachers who seems to be more concerned with their role as mediator, and proposer of an active, empathetic listening.

This approach gives priority to the development of a shared path together with the students. Rather than first verifying the truthfulness of the news and, consequently, demonstrating to the students the true nature of news itself, the teachers said they preferred to leave the discussion open, trying to make children reflect on their reactions "as not to remain on an instinctive level where divergent opinions are simply opposed." In this way a critical reflection "on the communicative intention of some types of information" would be promoted, and gradually one would reach a conclusion through a path of sharing and reasoning, "civil and constructive, in which one would look for alternative sources to compare the news." In summary, this approach sees in the figure of the teacher a moderator/mediator, whose crucial role lies in knowing how to lead an active and respectful debate. For this group, it is incredibly significant to make the children

understand the nature of the hypothetical news, without showing at the first stage whether it is fake news or not, "to try to arrive at synthesis as shared as possible." In other words, without imposing the notion that the information reported in class is a priori wrong, but endorse the opening of "a guided debate and only at the end clarifying that it is a fake news, making the children understand the danger of their impulsiveness in expressing a judgment for or against migrants immediately." Another aspect that emerged from open answers is the opportunity for "growth and [learning], both for students [...], [and] for the teacher" that such discussions would arouse.

BEHAVIOURS

In this section of the questionnaire, interviewees were asked to express their opinion on the behaviour they would adopt in the face of the hypothetical situation presented. Eight sentences were provided, and teachers had to evaluate, also in this case, on a scale of 1 to 5, in which 1 indicated "strongly disagree" and 5 "strongly in agreement."

The sentences were as follows:

Items	Mean	DS
H21) I advise children to talk to their parents	3,55	1,239
H22) I stimulate a discussion on the sources of the news	4,27	,932
H23) I promote an in-class discussion on the subject of the news	4,10	1,033
H24) I discuss in class ways of evaluating information found online	4,32	,866
H25) I decide to plan a more lasting intervention on the use of the internet for information search	3,72	1,184
H26) I decide to stop the discussion and return to my teaching	2,32	1,343
H27 I independently search for the truth of the news and the day after I explain to the boys what I found	3,47	1,375

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H28) focus my intervention on the issues of racism, violence and respect for disabilities	3,89	1,098
H29) I stimulate a discussion on mutual respect	4,21	,994

Statistics

		H21	H22	H23	H24	H25	H26	H27	H28	H29
N	Valid	458	469	466	465	461	461	462	463	465
	Missing	18	7	10	11	15	15	14	13	11
Mean		3,55	4,27	4,10	4,32	3,72	2,32	3,47	3,89	4,21
DS		1,239	,932	1,033	,866	1,184	1,343	1,375	1,098	,994

As can be seen from the data shown in the table, the responses of the teachers are rather uniform.

The point on which they are the most in agreement and in which the evaluations are more uniform among them is the item H24 (I discuss in class the ways of evaluating the information found online), which reports a high mean (4, 32) and a low standard variation (0.866). Also, in item H22 (I stimulate a discussion on the sources of the news), the interviewees strongly and compactly agree (mean 4.27; SD 0.923).

In general, it can be said that the data confirm what was described in the previous section when we analysed the open questions. Teachers are favourable to stimulate constructive dialogues, both on news sources and their subject, directing the debate on the issues that refer to the news, such as mutual respect, racism, violence, and respect for disabilities.

The point on which they are more in disagreement is item H26 (I decide to stop the discussion and return to my teaching), which reports the lowest value of the battery (2.32).

The second-lowest values, already quite positive (3.47), can be found in item H27 (I autonomously search for the truth of the news and the day after I explain to the boys what I found). This data is in accord with the answers obtained previously in the open question: the teachers seem to be more inclined to verify

the truthfulness of the news with the students or, in any case, to conduct a critical debate on the information that is found online and on the sources themselves.

At the end of the battery, there was an open question allowing teachers to suggest other behaviours they would have adopted in the described scenario.

Once again, most of the suggestions expressed the desire to promote a constructive, respectful dialogue among the students, mediated by the teacher. They also declared that they preferred not to look for the source without involving the students: the best option is to verify it together or have it verified directly by them, because, "We must stop acting for them and pass them already pre-digested information to be uncritically swallowed." Even in this circumstance, the teachers imagine themselves open to the dialogue and see the debate as a stimulus to face current issues that could concern pupils in the first person.

9.6 DIFFERENT STYLES OF REACTION TO THE FAKE NEWS SITUATION

Having described the mono-variated distribution of the variables in our sample, is possible to proceed in the analysis of their relations, according to the original hypnotized structure. Considering the nature of our data, which are mainly ordinal, the correlations are calculated using non-parametric indexes.

Age holds a light correlation with the use of Social Network Sites (Rho = -,186; p>,001), with the consumption of news online (both via newspapers and social networks) (Rho = -,190; p>,001), with the Educational ICT self-confidence scale (Rho = -,183; p>,001) and with the Fake News self-confidence scale (Rho = -,142; p>,001). These correlations say that older teachers are overall slightly less confident in their relations to ICT, as it was expected, but that this effect is not very strong. Age does not correlate with the adoption of a constructive approach to educational strategies against fake news, a result in line with literature on this subject.

The **strongest relations** are found between the use of social network sites and the consultation of online news (Rho= ,560; p>,001), both in fact giving a measure of online behaviour of respondents, and between the two self-confidence scale (Rho =,521; p>,001). This means that high confidence in ones' ability to use effectively ICT in educational settings relates with a high confidence in the ability to deal with fake news.

At the same time, while the Educational ICT self-confidence holds a slight, positive correlation with the consumption of online news (Rho =,180; p>,001) and with the use of Social Networks (Rho = ,147; p>,001), this is not the case for the Fake news self-confidence.

The Constructive strategies scale holds a moderate correlation with the Educational self-confidence scale (Rho =,271; p>,001) and the Fake news self-confidence scale (Rho =,354; p>,001).

Rho di Spearman		age	RECSNS	Online news tot	ICT Selfconf	Fake News Selfconf
age	Coeff.	1,000				
	Sign.	.				
	N	348				
RECSNS	Coeff.	-,186**	1,000			
	Sign.	,000	.			
	N	348	476			
Onlinenews tot	Coeff.	-,190**	,560**	1,000		
	Sign.	,000	,000	.		
	N	348	476	476		
ICTSelfconf	Coeff.	-,183**	,147**	,180**	1,000	
	Sign.	,001	,001	,000	.	
	N	341	466	466	466	
FakeNewsSelfconf	Coeff.	-,142**	,072	,099*	,521**	1,000
	Sign.	,009	,119	,033	,000	.
	N	342	467	467	459	467
ConstructivestratScale	Coeff.	-,059	,133**	,101*	,271**	,354**
	Sign.	,274	,004	,029	,000	,000
	N	346	467	467	459	459

Overall what the data suggest is that, apart from a slight impact of age, the behaviour of respondents seems to be connected with two main dimensions:

- one is connected with the **use of ICT**
- one is connected with a general sense of **self-confidence**

This result is confirmed by the factor analysis, which identifies two main factors explaining 56% of the total variance. The analysis of the component matrix (varimax rotation was adopted) allows to identify component 1 as the one more connected with ICT skills and component 2 as the one connected with self-confidence.

Rotated componetn matrix

	Component	
	1	2
age	-,445	-,144
ICTSelfconf	,215	,750
FakeNewsSelfconf	,034	,849
ConstructivestratScale	,027	,599
RECSNS	,855	,015
Onlinenewstot	,847	,044

Metodo di estrazione: Analisi dei componenti principali.

Metodo di rotazione: Varimax con normalizzazione Kaiser.

a. Convergenza per la rotazione eseguita in 3 iterazioni.

In fact, if we analyse the distribution of the variables in the 2 dimensional space created by the factors, we can see how online behaviours variable are very close and opposite to age, while fake news self-confidence, ICT self-confidence and constructive strategies cluster together, but with ICT self-confidence slightly closer to the online news consumption and SNS use.

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Grafico componenti nello spazio ruotato
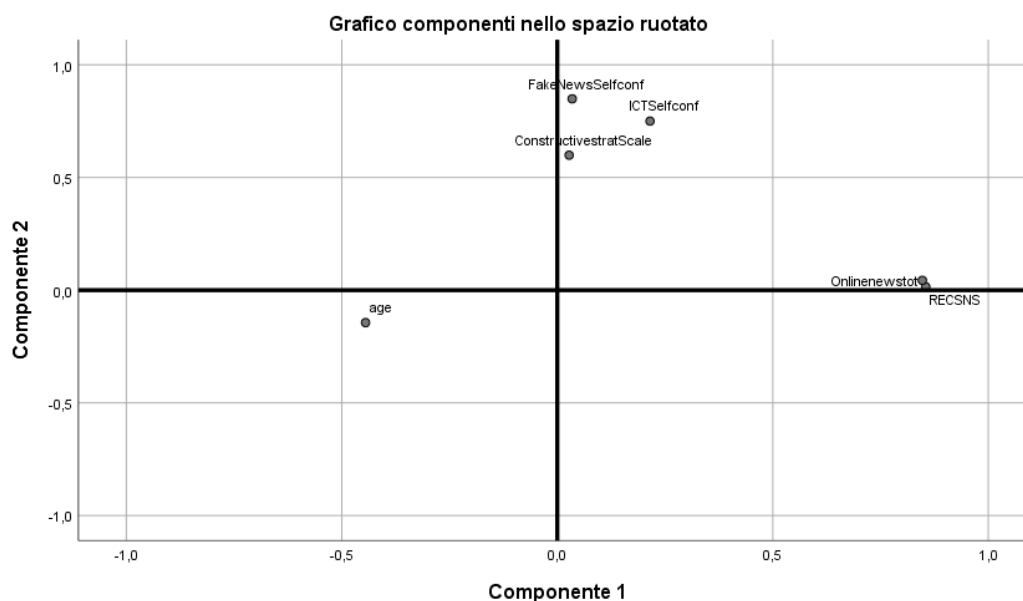
Profiling the teachers

The variables are used to identify groups based on similarity in their answers, in order to describe relevant profiles. We use the Cluster K-means analysis, which ask us to define a number of clusters. We try two different solution, one with 4 clusters and on with 3 clusters:

4 clusters: convergence reached after 37 iterations

	Cluster moderates	high confidents	teknos	no-teknos	range for each scale
ICTSelfconf	43,28	59,89	50,47	24,64	7 to 70
FakeNewsSelfconf	42,97	48,97	32,74	30,33	6 to 60
ConstructivestratScale	41,84	44,14	34,43	38,14	5 to 50
RECSNS	0,36	0,45	0,42	0,23	0 to 9
Onlinenewstot	1,09	1,27	1,15	0,82	0 to 2

Number of cases in each cluster		
Cluster	1	114
	2	198
	3	98
	4	66
Valido		476
Mancante		0

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3 clusters: convergence reached after 14 iterations

	Cluster moderates	high confidents	traditionalists	range for each scale
ICTSelfconf	46,95	59,1	25,17	7 to 70
FakeNewsSelfconf	37,25	48,99	31,49	6 to 60
ConstructivestratScale	37,8	44,17	38,4	5 to 50
RECSNS	0,4	0,45	0,22	0 to 9
Onlinenewstot	46,95	59,1	25,17	0 to 2

| Number of cases in each cluster		
Cluster	1	114
	2	198
	3	98
Valido		476
Mancante		0

In the four groups solution we find:

- **highly confidents**: with high values on all the variables, both related to self-confidence and ICT
- **moderates**: with quite high levels of self-confidence, and lower values on the ICT variables
- **teknos**: with very high values on ICT variables, close to those of the highly confidents, and low self-confidence values
- **non-teknos**: with very low value on ICT variables and moderate values on self-confidence variables.

The three groups solution merge the last two groups and give us:

- **highly confidents**: with high values on all the variables, both related to self-confidence and ICT
- **moderates**: sharing with highly confidents the values related to the use of ICT, and with lower values on the other trhree scales
- **traditionalists**: with very low values to all variables ICT related and a higher level on the constructive strategies scale.

How groups define fake-news:
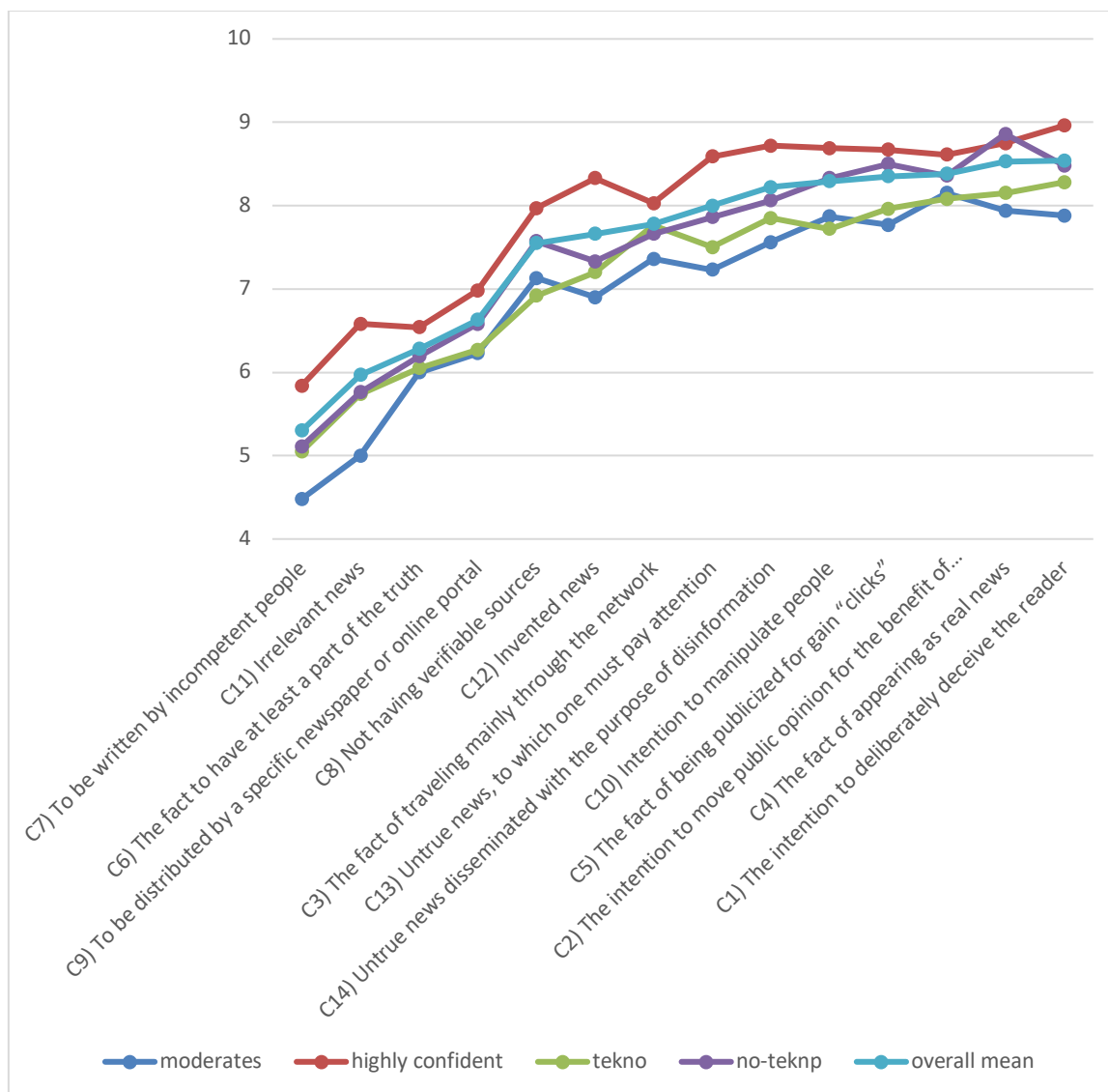
Confronting the trend of answers of the four groups, is possible to see how the biggest difference is registered between highly confident respondents, that seems to agree more strongly than any other group with all the assessments, and moderate, that show the opposite pattern. It is worth to note that, although the differences are almost always statistically relevant, they don't always have a high magnitude.

On some aspects the group answer in a more compact way and on some other (as already highlighted in the monovariate analysis) there is more difference of

opinion. Among the aspects registering higher level of diversity among the groups
are the statements:

- C11) Irrelevant news
- C12) Invented news
- C7) To be written by incompetent people
- C13) Untrue news, to which one must pay attention
- C14) Untrue news disseminated with the purpose of disinformation
- C1) The intention to deliberately deceive the reader

### How the groups see school's role in facing fake news
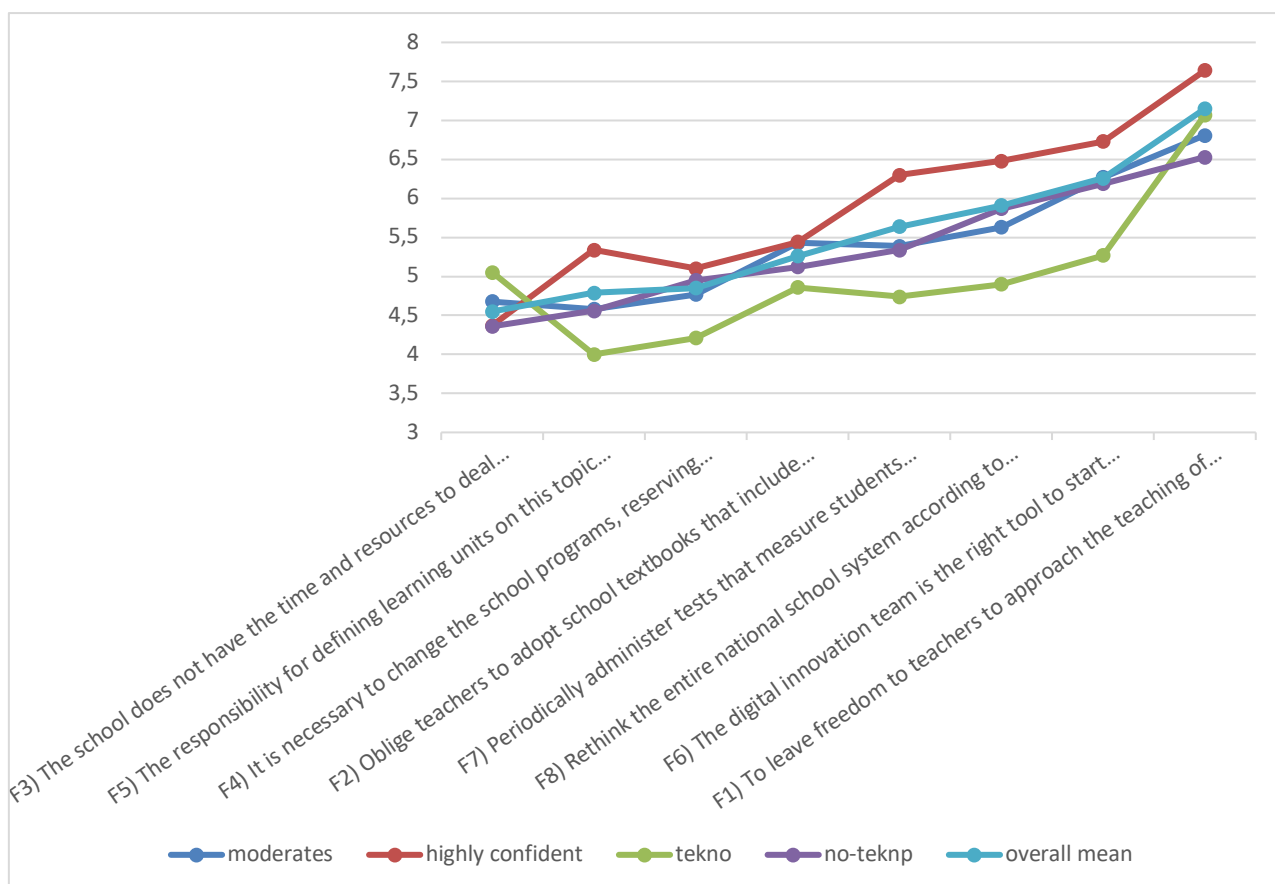
In this case, the biggest difference is registered between highly confident and
tekno respondents. More specifically is possible to see how the group of tekno
respondents seems to separate itself from the rest of the teachers. In general,

the group answers with values lower than the other groups, and the maximum difference is in the following items:

- F8) Rethink the entire national school system according to the digitization of the school
- F7) Periodically administer tests that measure students critical thinking skills, at national and transnational level
- F6) The digital innovation team is the right tool to start contrast and response initiatives
- F5) The responsibility for defining learning units on this topic should be entrusted to a specific teacher for each class

However, it is worth noting that this trend is reversed (although with a smaller magnitude) for the controversial item F3). The school does not have the time and resources to deal with the problem of fake news, where this group produce an answer higher than the one of the other groups.
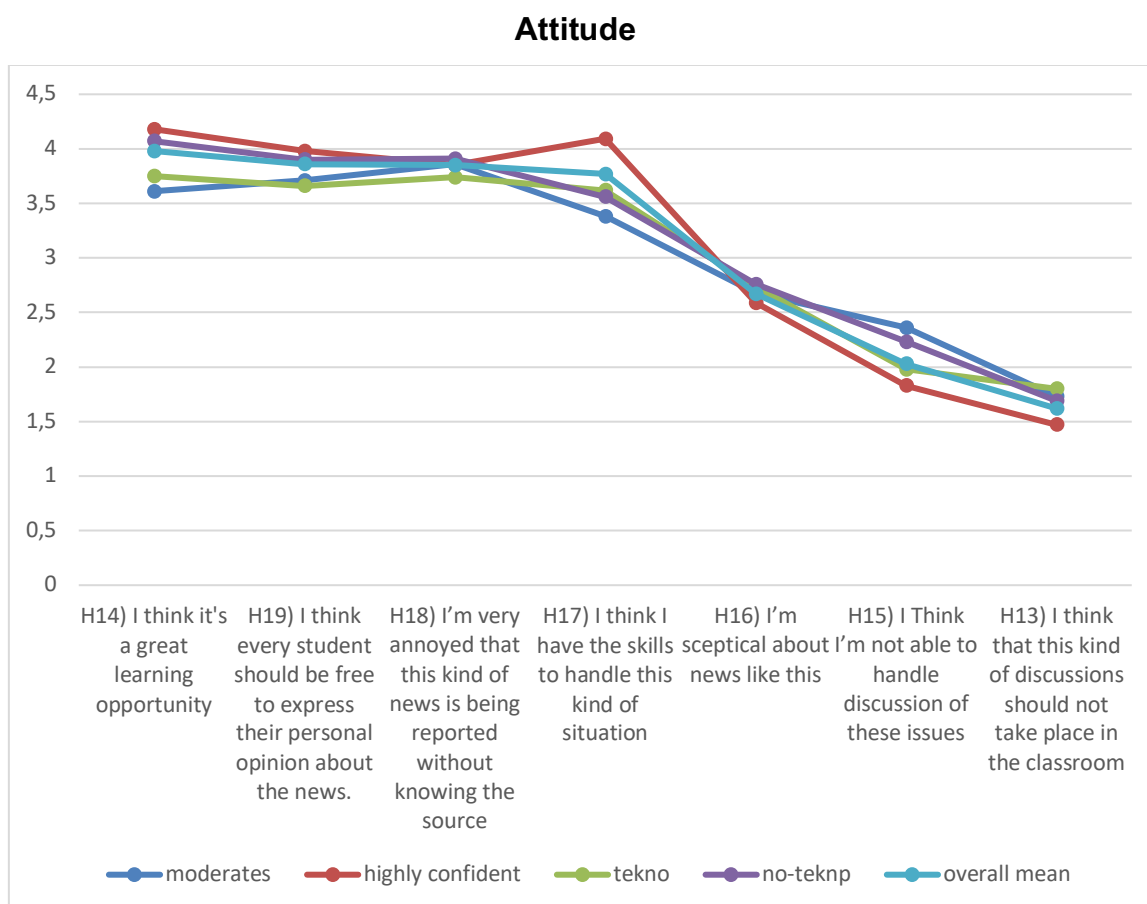
Analysis of the answers to the scenario
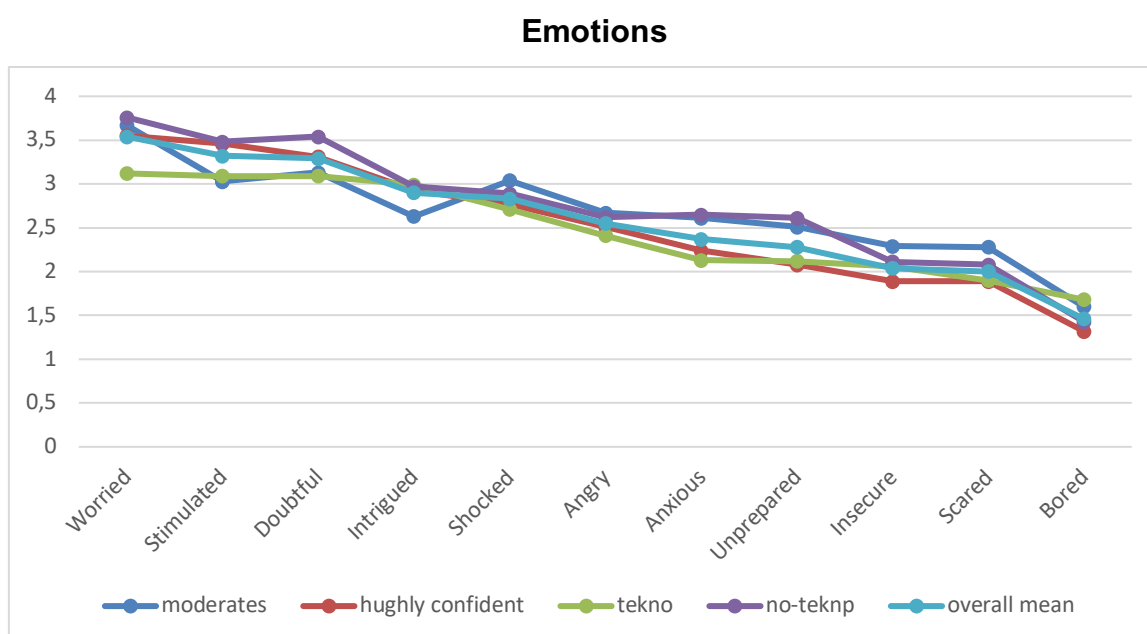
Emotions

The emotions provoked by the scenario present a pattern of answer less clearly differentiated by between groups. While for many of them no significant difference is found between the groups, the answers differ for the options:

- Worried: mostly between tekno and no-tekno, with the first group showing the relatively lower values (although still quite general on the total scale)
- Anxious: once again teknos are the less anxious, accompanied by highly confidents, while no-teknos and moderates have higher level of anxiety
- Unprepared: this variable shows the same pattern of the previous one, with teknos and highly confidents feeling more prepared than moderates and no-teknos
- Stimulated: in this case, we see tekno and moderate pair in their low feeling of stimulation, which is higher for highly confident and no-teknos
- Bored: the difference is very slight, but show teknos as more inclined to indicate some feeling of boredom, and highly confident as least inclined

Resuming this result, we could say that **teknos** are not particularly scared from the fake news issue but also not very interested in facing it in class; **no-teknos** are more insecure at a ICT level, but more willing to take up interaction with the students; **moderates** are feeling pretty unsecure and are not very willing to take action and **highly confident** feel both up to the task and willing to act.

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Attitude

In this set of items, we register the biggest difference between groups on item 17 "I think I have the skills to handle this kind of situation", with highly confidents scoring higher than any other group, moderates scoring lower and the tekno and no-tekno scoring basically the same.

A specular situation is registered on item 15 "I think I'm not able to handle the discussion of these issues", where the high level of agreement is reported by moderates and no-teknos, while highly confident score low, and teknos remain in between.

As for the item 13 "I think it's a great learning opportunity", we see that this kind of attitude bring together highly confidents and no-teknos, and is much less relevant for teknos and moderates.
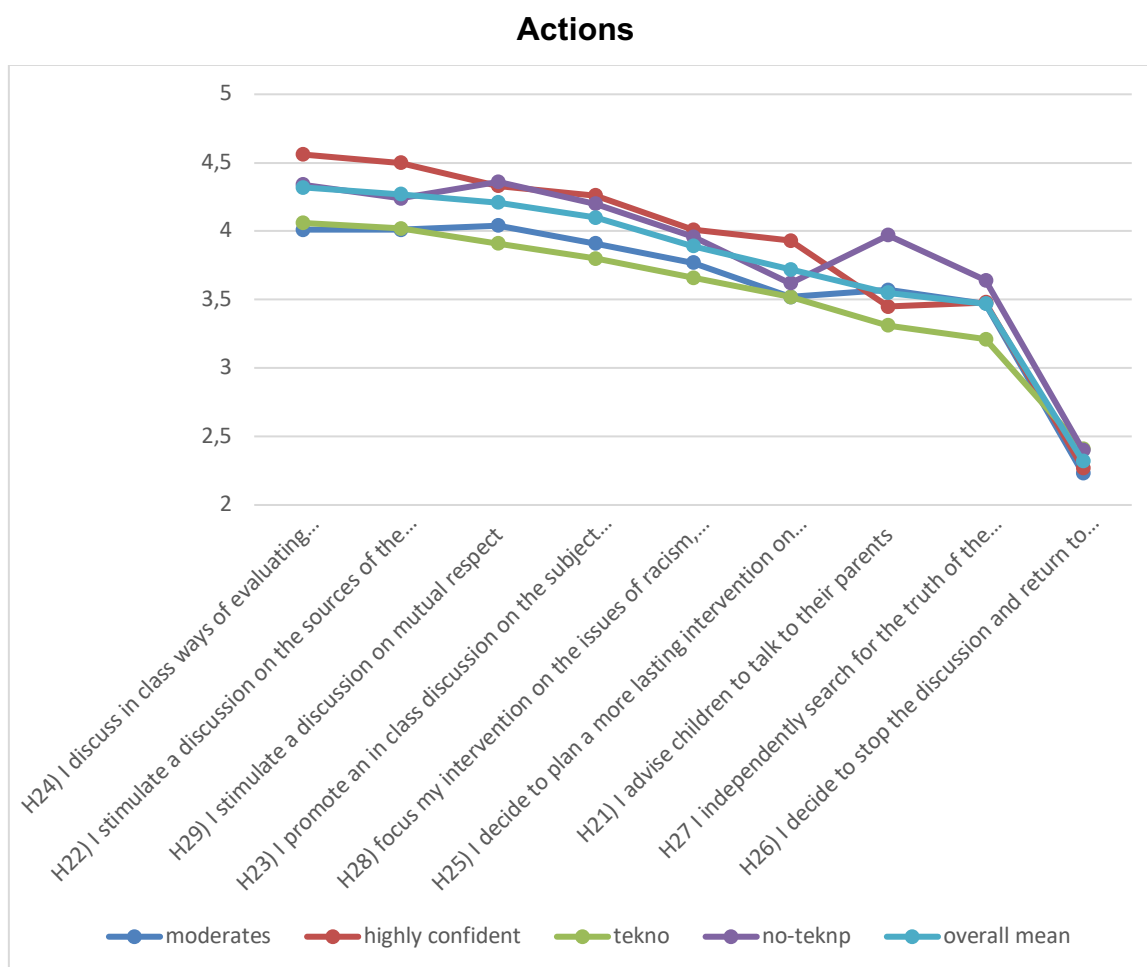
Actions

As we can see in the distribution of the actions proposed, all kind of discussion in class, both on the technology and on more social themes are highly evaluated, but more so from highly confidents and no teknos, while teknos and moderate show less inclination to this kind of action. Moreover, the inclination between moderate and teknos diverge slightly when the subject of discussion is not technical (moderate seems to favour this kind of talk more).

In general, teknos seem to be less inclined toward all of the options proposed.

No tekno distinguish themselves for the highest propensity to advise the students to talk to their parents and try to independently find the sources of the news.

10 CONCLUSION

The viral spread of digital misinformation has become so crucial and critical that the World Economic Forum considers it among the main threats to human society (Howell, 2013). The acceleration and interconnectedness in every field of human activity are pushing the absorptive capacities of institutions, communities, and individuals to their limits. This is putting future human development at risk. Moreover, at a global level, humanity is facing a growing number of systemic challenges, including fractures and failures affecting both the technological and institutional systems on which our future rests.

The current generation is enjoying unprecedented technological, scientific, and financial resources and upgrades, which we should use to chart a course towards a more sustainable and inclusive future. And yet, this is also the first generation taking the world near a systems breakdown (Castells, 2010; Collins, 2018).

The problem of the construction of identity in the networked era is also another great theme affecting both youngest generations (sometimes named as digital natives) and oldest generations who are trying to "adjust" themselves to live in an always more digitalized environment. Nonetheless, the education system is keeping progressing slowly in this direction, as also shown by the results in our empirical research with teachers.

It is our opinion that the difficulties created by the shift from an analogical society to a digital and networked one are the same that are creating the passage from evolved groups trying to exchange and create new knowledge – i.e. online groups like communities of practice and e-learning communities – into online crowds in search of continuous information on the internet. Those masses of

people are often unable to judge information veracity by themselves and are becoming more and more vulnerable to new media dynamics and traps. After all, it is not a novelty that when people are assembled into crowds, they tend to delegate their ability to think critically to follow the thoughts of their leader (Bon, 1980; Foroughi, Gabriel, & Fotaki, 2019). So, even when we are in online environments, we can see the same regression that is characteristic of groups when they become an online crowd (Borch & Knudsen, 2013; Zhang, Choo, Sangaiah, & Chen, 2018).

Following Stage (2013) reflections about Le Bon (1896) crowds' theory we can say that there is a "theoretical distinction between three different types of crowds that prioritize the role of physical co-presence in different ways: the traditional body-to-body crowd based on physical co-presence; the mediated crowd, which has a strong offline dimension but uses media technologies as tools or communication environments; and the online crowd, which I define as the affective unification and relative synchronization of a public in relation to a specific online site". In our view, the "online crowd" way of thinking and re-elaborate information is precisely the one that we can find inside echo chambers, and that also coincide with the cognitive mechanisms that makes their existence possible.

This leads us back to the spread of fake news and their relationship with the creation of echo chambers in the social network spaces. Even if the causal nature between the two phenomenon has proven challenging to prove, mostly due to the nature of "social media, whose causality is characterized by complexity, non-linearity, and emergence" (Törnberg, 2018), we strongly believe in their relationship.

Nowadays, there is intense scientific debate around the definition of the foundational concepts of how news and opinions circulate on the web, as well as about the most appropriate methodological approaches to understand social dynamics that have led to the formation of echo chambers and their role in the diffusion of disinformation and fake news. Nonetheless, the challenge of understanding human behaviour inside those niches remains complex and intricate. People are intentional but not necessarily rational (Pennycook & Rand, 2019). Their dynamics in the social space are influenced by the social context as

well as by the information reported in the media in that same context (Quattrociocchi et al., 2015). The interaction among people, with the advent of the internet and the infinite networked possibility guaranteed by it, have led them to an essential change of role: people are not passive anymore. Toward media information, people can now be proactive and choose their sources of information. This also led to a competition between mainstream media to keep their audience by continuously interact with them to adjust proposed content to collect the highest number of followers in a worldwide context. Hence, the evolution of the mass tastes and personal belief has become more and more crucial, and so has the process to convert and recruit people (Bessi, Coletto, et al., 2015; Quattrociocchi et al., 2015; Verschuere & Shalvi, 2014). Their scope is to convince people to adhere to the most different topics – e.g politics, economics or "new world order conspiracy" and so forth (Bessi, Coletto, et al., 2015; Mancosu, Vassallo, & Vezzoni, 2017; Mocanu et al., 2015a).

Also, the problem of hyper-partisanship and radicalization is becoming huge in numbers, and the fact that it seems connected to the making and the circulation of fake news inside online echo cambers is undoubtedly scary because it leaves Institutions completely unpowerful (Castells, 2009; Dahlberg, 2007; Faris et al., 2017). We have seen how easy it can be for young people to choose to adhere to extreme polarised parties or "scientific" unfounded theories, put on the web just for fun or – even worst – to deviate public opinion in a specific direction (A. E. Marwick & Boyd, 2014; A. Marwick & Lewis, 2017; Alice Marwick & boyd, 2014). One of the factors that make this possible is today's need for young people – as well as for adults put in a condition of fragility by the surrounding social system – to perceive their self-identity has something defined and meaningful. Since the "identity obsession" (Castells, 2010; Remotti, 2011, 2012) has become so common and diffuse, also the feeling of belonging to a group with powerful and strong ideas, purpose, and agenda has assumed great importance for those categories of individuals.

Emotions undoubtedly play a fundamental role in people's adherence to these groups that are mainly dedicated to the diffusion of false information and (mis)believes. As it has been recently demonstrated, false stories spread farther,

faster, and more broadly on social media than true stories. In particular, false political stories usually reach more people in a shorter amount of time than any other types of fake stories (Vosoughi et al., 2018b). These fake news stories are also often believed to be true (Silverman & Singer-Vine, 2016), and, as we acknowledged, just being repeatedly exposed to a fake news headline can increase the possibility of later belief in that topic (Pennycook, Cannon, & Rand, 2018).

Emotions are central to the experience and help us to explain why people accept the improbable as probable. Individuals can not deny their own experience when feelings dictate them because, for everyone, to feel is experiencing something, and personal experience is the main road to believe. This explains why people tend to use emotions as pieces of evidence. If people start to view emotion as something that can only compromise rationality, then it becomes hard to imagine an emotional belief as something that has the potential to lead us to knowledge other than capture anything else than fantasies or illusions. As Mercer (2010) wrote, rationality depends on emotion. An emotional belief is one where emotion constitutes and strengthens the belief, and which makes possible a proven generalization of the cognitive mechanism and biases that enables it. However, the experience of emotions is not only a mere product of cognition or a reaction to a belief. Feelings also influence what one wants, what one believes, what one does, and also what one remember the most (Mercer, 2010).

Emotions are also at the very basis of three fundamental construct, that are essential to understand how fake news can create such deep distortion in people reality. They are: Memories, Personal Histories, and Collective Narratives.

There are many studies and researches about memory function for the acceptance of fake news by individuals. They can raise a vast range of emotions that attaches one to another to create sense and amplify personal histories – i.e., experiences –, allowing them to connect themselves to historically significant shared narrations. Usually, people move through virtual and real culture, both physically and psychologically, with their memories and emotions that function as a signifier for new pieces of information.

Following Zittoun and Gillespie (2015), "moving through culture shapes a series of experiences across the life course, and these experiences "layer up" within individuals, forming complex sedimentation [of memories and] culture within individuals." Since culture and memories are both heterogeneous and fragmented, the sedimented layers of experience will also have the same characteristics and will become the base for the creation of spaces of tension and interstices for the internalization of fake news in personal histories.

Personal histories can then modify themselves in the dynamic process of the individual's mind in order to adhere to echo chambers storytelling and how their communities make sense of the world. We have also seen how much personal life-stories and attitude can make individuals more likely to enter into online echo chambers (whether they are communities of trollers, gamegaters, hate groups, ideologues, or alt-right groups, conspiracy theorist, and hyper-partisan news outlets), and adhere easily to their believes (A. Marwick & Lewis, 2017; Wessel, Thies, & Benlian, 2016). In particular, it has been demonstrated how "delusion-prone individuals may be more likely to accept even delusion-irrelevant implausible ideas because of their tendency to engage in less analytic and less actively open-minded thinking" (Bronstein, Pennycook, Bear, Rand, & Cannon, 2018). Even dogmatic and fundamentalists individuals are more likely to believe false news instead of real ones and fill the holes of their memory with information that combines with their beliefs. These relationships between personal life-stories and the tendency to adhere to hyper-partisan and fake news dispensers may partially be explained by a personal analytic cognitive style that is developed by individuals also thanks to their past (Obradović, 2017).

Collective Narratives, for example, can give us a good idea about how people – or aggregates of people, the so-called "crowds" – see and live themselves in the contemporary information world. Meaningful and deep narrations are often surpassed by extremist ones, which distort the way people can read the social dynamics and perceive the world. Thus, tendencies to the development of sociopathic behaviours (i.e., like Durkheim's anomie (Abrutyn, 2019; Durkheim, 1987; Smith & Bohm, 2008) or Benasayag's sad passions (2003)) can manifest themselves both in the online environment (i.e., with the hate speech

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phenomenon (Howard, 2019; Saleem, Dillon, Benesch, & Ruths, 2017), and in the real world, developing in the creation and diffusion of fake news (McGonagle, 2017), and, as a consequence, also take form as mass criminal episodes. For cognition to be situated in the collective memories and narratives scenario, it means to accept that some psychological capacities and states that are part of the individual are also parts of the world that physically constitute those individual capacities. Accepting the extended mind thesis then means to accept that the mind is not physically bounded by the body but extends into the (real or virtual) environment of the organism (Gutsche, 2012; Wilson, 2005).

Social Media had undoubtfully made the individuals' aggregation process easier, alleviating people's feelings of loneliness. They allow people to find their truth and build their image of a world in which they can fit in, abolishing all the challenges of living in a world full of complexities. Social Media also allows some people to make sense in what – from their point of view – is a too messy and complex world, in which they can not orient themselves. Echo-chambers and fake news became like safety anchors for them, becoming concrete elements of their personal lives and narratives, and filling the sense of void and lack of purpose.

To summarize, we found out that there are three levels of attention that we must always keep present when analyzing the fake news phenomenon. They are: the connection with social media (which regard the relationship within man and technology), emotions (that are fundamental to understand because they affect individuals' judgment), and the crowds and its dynamics on the internet (that can explain to us why we can behave so differently when we are on the net).

10.1 TEACHER'S AND FAKE NEWS: WHAT KIND OF RELATIONSHIP?

From our cluster analysis, we identified four kinds of profiles in which we can divide teachers based on their relationship with the fake news as a problematic social phenomenon, their confidence in the ability to teach to their pupils the skills

that they will need to face it, and finally on their relationships with innovations and the digitalization. We called those groups the highly confidents; the moderates; the teknos; and the non-teknos.

The highly confidents are the teachers that have high value both in the ICT and fake news self-confidence scale. The moderates are the ones who have high values related to the use of ICT and lower values on the other three scales (Fake news self-confident scale, Fake news and education strategies, and the constructive strategies scale) and are feeling pretty unsecure and not very willing to take action. Instead, highly confident feel both up to the task and willing to act. The teknos are not particularly scared from the fake news issue but also not very interested in facing it in class, while no-teknos are more insecure at an ICT level, but more willing to take up interaction with the students. They have very low values to all ICT related variables but also a higher level on the constructive strategies scale. This could mean that even if they are less prone to innovate their didactics introducing technological devices and new methodologies, they could also be more pedagogically prepared to face unexpected fake news related problems in their classrooms.

Overall, teachers declare to be able to do all the actions described in the ICT self-confidence scale, except for the actions that require them to choose the more appropriate digital tools for a specific purpose or educational environments, and for promoting creativity in their classroom. This could also be seen as a lack of preparation and training about the almost unlimited possibilities that the web gives us today to create innovative and more engaging activities for teaching. However, it would not be so hard to fill those holes, learning even in an informal way, joining free online communities of practice (e.g., Edmodo) where teachers exchange their experiences and ask advice to each other about every aspect of didactics, and mostly about programs and apps to use to make their pupils exercise.

As for the fake news self-confidence scale, the results demonstrated that teachers are quite positive and declare to know what fake news is, and indeed they took into consideration several aspects of the possible definition related to the fake news concept but also left aside some other equally important pieces.

For example, they do not consider that fake news can thrive in a real context, starting from a piece of actual news. However, as we have seen, this underestimated element is an essential part of our cognitive and memory system to relate to fake news and create both personal and collective bonds with it.

Teachers also declare that they would be able to explain what fake news is to their students, but at the same time, they admit that they have never elaborated a strategy to do it in their classroom. We also found out that the factors measuring their self-perceived ability to deal with fake news are the ones with the lowest score if compared with the ones that define their self-perception to be able to define and recognize them. So we can see how their experience in dealing with fake news is almost opposite to their self-perception and confidence in their ability to do it.

Hence, if we analyse their responses on the fake news and education scale, we can see how they show a positive attitude towards the possibility of receiving specific training on fake news both for themselves and for their students, even if in our personal experience we have not found this kind of openness. Principals seem a lot more worried about themes like cyberbullying and dedicate most of their founding on the implementation of programs and conferences on that topic, underestimating the importance that a proper training against fake news – that would involve elements of informational literacy, new media literacy and the exercise of lateral and critical thinking – could have in training the citizens of tomorrow.

One positive factor that emerges from our analysis is that teachers do not connect the need to augment computer skill training for dealing with fake news. In other words, they do not overemphasis on the learning of computer literacy – which has become a core skill in our school system – at the expense of other forms of literacy, that would be way more useful for millennials. For example, information literacy, or the ability to fully capitalize on the information that is available through digital technology, would be far more useful for pupils who probably would know how to use any device better than their teachers, but are undoubtedly less able to structure, find, evaluate and use the information to which those devices provide access (Abell & Oxbrow, 2001). Teachers think instead

that the collaboration with parents and reinforcement of general culture could be a good point to start an educational pathway in critical media literacy with their students. Consequently, the promotion of specific educative spaces combined with a shift from a simple evaluative paradigm to a content re-elaboration one is well seen. The main concern here is that the mastery of computer literacy envisaged by the Italian government is not embedded in an appropriate information literacy framework, but relies on a surpassed approach which falls short of covering the complex, critical and ethical interaction with information (Whitworth, 2007).

If we consider the constructive strategies scales, and the two factors that emerge from them, we can see how a constructive approach to the learning about fake news is judged better than a more "protective" one. If, on one hand, the engagement of parents in the debate about fake news is seen as a good sign, on the other restriction to the access to social media does not seem like the right solution to them. Those are both good results because they show us that teacher's way of thinking to ICT educational pathways are in line with academic research and results. In fact, we know well that the acceptance of parental authority is a key factor in the effectiveness of teaching, and that when using internet at home parental mediation is essential for pupils to consolidate their learnings. Also, as every educator knows, parental mediation is a dynamic process shaped by both parents and children, in which teachers can easily act as facilitators to enhance active mediation process by the parents, which has demonstrated to be the more effective one (Symons, Ponnet, Vanwesenbeeck, Walrave, & Van Ouytsel, 2019). However, we also know that during adolescence parental mediation is assumed to be less effective due to adolescents' increased need for autonomy and resistance to parental authority (Van Petegem, Vansteenkiste, Soenens, Beyers, & Aelterman, 2015). Still, parents remain the primary socialization agent for their children (Otten, Engels, van de Ven, & Bricker, 2007) and also the only one that can keep them away from the risks that internet can offer (e.g., cyberbullying, online sexual harassment, fake health information, or excessive screen time (Fahy et al., 2016; Moreno, Kelleher, Ameenuddin, & Rastogi, 2014; Sorbring, 2014)), together with a multitude of

useful information (that often need to be re-elaborated anyway, even when not fake news).

As we already said, we found a correlation between teachers' mental representations about fake news and the strategies they would use to deal with them inside educational environments. Strategies vary based on how they describe and define fake news. This is also strictly correlated with their level of commitment to learning and teaching new competences to contrast the fake news phenomenon.

Speaking about competences and skills to deal with the fake news phenomenon, and having make an inquiry only with in-service teachers, we could infer that even the people who should have the highest level of intellective tools are unfortunately not prepared to face the rise of new digital and social phenomenon if not adequately informed and trained to deal with them. To be able to move safely in a digitalized world, we should build ourselves an armor made of soft and transferable skills that are not always exclusive of the formal education system. Some of these skills, or informational abilities, are communicative abilities, team working, problem-solving capability, adaptability, and commitment to lifelong learning, and they can help students to gain the informational capital that, according to Castells (2009), is the key to enter in the new informational labor market.

Also, we found out that emotions have a significant impact on how teachers perceive themselves "able enough" or "willing enough" to teach to their students what fake news are, and how not to fall for them. These data could also help us explain the reason why they can be so reluctant to approach the fake news theme in training, even if they formally declared the contrary. As a matter of fact, when asked to evaluate the degree of different emotions they could feel when in contact with fake news that changes the equilibrium of their educational environment, they mostly choose the words "worried," "stimulated," and "doubtful". In the open space for the description of how they would feel, some of them even wrote "interested." All these emotions give us the image of a professional finding him/herself in an unattended situation. Something that they have never faced before that makes them feel insecure, but at the same time, creates an

opportunity to experiment and learn something new. In the attempt to find a solution to the proposed scenario, they would go in search of the sources of the news in question, make a description to the students, and open debate with them.

Always staying to the data, they would do all the process without feeling any "insecurity" or "anxiety", which sounds a bit odd if we consider that the vast majority of the respondent also declared that they have never found themselves in a situation like the one proposed, created by the diffusion in the classroom of a fake news. It should also be said that they declared to feel "irritation" and "indignation" toward the topic of the fake news we proposed in the scenario, which demonstrates a certain level of interest for the topic itself, but also a potential loss of self-control and neutrality. They also express a concern for the lack of protection and interest by the social and school system, which could be interpreted as a source for their worries to work with (real or fake) news that is connected to the dissertation of particularly "hot" and controversial societal and political topics. This could be related to the recent development of the work environment that teachers had to suffer in the last years, in which the work of the teacher has lost a lot of its original prestige (Clarke & Newman, 2017), to become an ever-evolving, complex, underestimated, and underpaid job.

10.2 ATTITUDE IS NOT ALL

From our findings, we realized that the perception teachers have about their ICT skills is quite high. It appears that while it was easy for them to give elevated score to questions connected to a "passive" use of ICT, their level of uncertainties raised when we asked them to evaluate themselves on more "proactive" ability to use ICT (i.e., being able to select the digital functions most suitable for a specific educational setting, and offering students the opportunity to express ideas creatively through the use of ICT).

We found the highest value of the self-confidence ICT scale in item 4, where they were asked if they considered themselves able to stimulate pupils to make critical use of ICT. While the answer to this item could be biased by the fact that teachers knew what the main research topic was (fake news), and by the connection that they could see between it and the critical thinking topic, it could be still interesting to notice that in the valuation phase, many of the teachers interviewed seemed confused and asked us to be more specific about what we meant when we wrote: "using ICT in a critical way".

These results demonstrate to us how much even the most trained people can be self-deceiving when it comes to self-evaluation, but also how hard it can be for individuals to migrate from an analogical world to a digital one and being forced to adapt themselves in a relatively small amount of time. In Italy, the digitalization of schools has happened in the course of many years. Even if the process is not complete, people – and parents above all – expect teachers to be the first to adapt to this change and to be ready to give their children all the tools they need to live in a technologically mutated world. Considering the amount of money that has been allocated from the State to allow the changing of the school system, especially in the first years of educational policy reforms, and considering the poor results that those kink of policies have obtained, we can say that devices without appropriate training and willingness to learn are surely not enough to enable a complex system change (Diamantini, 2014; Gui, 2019; Selwyn, 2010, 2011).

We know well how the social sphere surrounding us could easily bias our self-perception. As we have already said, for Italian teachers there are also some problems affecting the work category that does not simplify the process (e.g., being continuously judged by the school system, the loss of professional prestige in the eyes of society, the fact that they are used to give scores, and so forth). Nonetheless, international studies demonstrate that Italian teachers, when confronted with teachers from other European Countries, are not so good in using ICT tools (Commission/EACEA/Eurydice, 2019), safe for some groups of technology and innovation's fans (like our highly-teknos sample sub-group). Those groups actively participate in dedicated communities of practice - often

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spontaneously born on social media pages - and create national and international networks in which exchange their knowledge both about new digital tools for teaching and best practices (often already experimented inside classrooms) for the creation of an ever-evolving digital literacy in education.

10.3 SCHOOL'S SYSTEM FOR SALE: WHEN LAWS ARE NOT ENOUGH

One of the main problems is that despite diverse Governments' signals of interest in the impact of fake news, and the presence of both a need and an opportunity for new media and digital literacy teaching, there is still a lack of material resources and support both for theoretical and applied educational research in the field (Chen et al., 2015). Notwithstanding, digital and new media literacy education should be a public right and a common good in democratic societies, as also shown by European and Worldwide agencies annual reports, which have started to underline the necessity to face the fake news problem already in 2013 (Gui, 2019; Joselit, 2017).

In time, thanks to the contribution of many academic researchers and international debates, some pathways for combating fake news have started to emerge (D. Lazer, Baum, Grinberg, Friedland, Joseph, Hobbs, Mattsson, et al., 2017), although there are considerable differences between them. Some are more connected with the technical side of the internet and are focused on the research of algorithms that can detect fake news without human intervention, while others give more value to the development of human cognitive ability and critical thinking.

As its main argument, the literacy approach suggests that educative intervention about new media and digital literacy should be implemented into schools to intensify individuals' cognitive ability to discern fact from fiction (Allcott & Gentzkow, 2017; Jang & Kim, 2018). However, this kind of proposal, which sees new media and critical digital literacy intervention as a complete solution

against the dissemination of fake news, has received several criticisms and disapproval of what is seen as an oversimplification of the problem (Mihailidis & Viotty, 2017b). The main critique of this kind of solution is that it does not take into consideration the cultural context of information consumption that we have created over the last 30 years (Boyd, 2017a), and it suffers from the lack of detailed didactic planning and substantial interventions (Boyd, 2014).

The only examples we were able to find in our literature review about meaningful actions and thoughts for the planning of new media and critical digital literacy are the ones deduced from journalists and librarians training. As we have previously underlined, journalists have always been the gatekeepers of information. For this reason, they have always been trained to apply forms of critical thinking when testing the veracity of sources and news. So, many curricular and pedagogical approaches have been developed and adopted by journalism educators. The most adopted approaches in the last decades – even for librarians – are the ones derived from the work of the famous educationalist Donald Schön's (1991), where concepts like 'reflective practice' or 'reflection-in-action' have been stated. This happened because of the need for those work categories to be equipped with the skills to pause and reflect in a very chaotic context, and to report and produce news and search for accountable information at the best of their capability.

This suggests to us at least two conclusions. The first is that even academics are not ready to offer a solution related to the best practice or methods that teachers could use in the classroom to deal with the fake news phenomenon, because very few researches have been done about that specific topic. Also, the school system (that in Italy comprehend the academic and research sector) does not have enough resources to enable researchers and expert to elaborate on the fake news problem properly.

The second conclusion is that even the suggestion that could come from the academical research to the school's teachers gets often lost or even blocked in their process of transition from one institution to another, due to an historical lack of communication between practitioners and researchers, but also between institutions.

10.4 WHEN THE SCHOOL IS NOT ENOUGH

Up until now, there have been various efforts to inject training of critical-information skills into primary and secondary schools. However, it is still uncertain whether such efforts improve the ability of student assessments of information credibility, or if they will persist over time. It could also happen that putting too much emphasis on fake news might produce the unintended consequence of reducing the perceived credibility of real-news outlets (Lazer et al., 2018a).

Basing on our findings, we can say that education, age, and total media consumption are strongly associated with a more accurate evaluation of the information contents. This association between education and capacity to distinguish correct beliefs and information from rumors and fake information should be highlighted because – in one way or another – it will undoubtedly give a social return. In any case, there is no doubt that better informed individuals are, indeed, better citizens (Mihailidis & Thevenin, 2013). On the one hand, education should increase people's ability to discern fact from fiction. On the other hand, in the presence of motivated reasoning, education gives people better tools to counterargue against incongruent information (Allcott & Gentzkow, 2017).

In conclusion, the opinion of the majority of experts is that the response to the problem of fake news and disinformation should be to increase the long-term resilience of citizens, communities, organizations, and Governments to empower people and help them recognize the various forms of disinformation. It is crucial to ensure that responses to disinformation from educative authorities are coherent and in line with an ever-evolving context, which requires constant monitoring of the fake news problem, together with all the other phenomenon that rise in the network society. It is their duty to design adequate and innovative responses and evaluate their efficacy, as it is teachers' duty to keep themselves informed and willing to train to acquire the skill to face them.

Finally, for new media and digital literacy to be effective, critical thinking targeted specifically at fake news should be implemented on a massive scale in

school curricula as in teacher training curricula, "with clear methods of evaluation and cross-country comparison and with reflection in educational rankings gauges" (Gabriel & de Cock Buning, 2018) – something that until now is unfortunately still missing.

So, what are the results stressed by our research that can give a better understanding of the fake news phenomenon? Furthermore, how can they give some input on how to deal with it inside the school system?

We have surely understood that being instructed and educated is just a starting point, but it is not enough, especially if people are not proactive in dealing with the societal change that surrounds them and are not ready to confront themselves with the unexpected evolutions and risks that could develop in the most hidden fringe of it.

Also, we understood that the dangers generated by a social system that tolerates the presence of fake news are not detected as such by the school system, that is still mainly interested in the prevention of cyberbullying, endorsing intervention about it and cutting out most of equally important digital-related issues. Therefore, researchers rarely have the chances to experiment and create serious solutions on the field. We see this as a missed chance that would make future citizens more aware of the dangers in which the internet can draw them and make them more conscious of how much it can affect society and the global systems of power. In fact, as recent studies have empirically demonstrated by investigating the causal relationship between social media usage and the perception or even actual changing of world-wide democracy state, there is a causal mechanism through which the internet and internet-based technologies can affect democracy, both in positive and in negative ways (Freedom House, 2019; Best & Wade, 2009; Jha & Kodila-Tedika, 2019*)*.

Nowadays, online social networking sites are experimenting with the following crowd-powered procedure to reduce the spread of fake news and misinformation: whenever a user is exposed to a story through her feed, he can flag the story as misinformation and, if the story receives enough flags, it is sent to a trusted third party for fact checking. If this party identifies the story as misinformation, it is marked as disputed. However, given the uncertain number of exposures, the high

cost of fact checking, and the trade-off between flags and exposures, the above mentioned procedure requires careful reasoning and smart algorithms which, to the best of our knowledge, do not exist to date.(Jooyeon Kim, Tabibian, Oh, Schölkopf, & Gomez-Rodriguez, 2018).

All the previously underlined aspects suggest us that there is strong need to find adequate training methods for all the professional figures involved in the education process, based on their relationship with new media in general and social media in particular. Our findings suggest that existing interventions increasing analytic and actively open-minded thinking might be leveraged to help reduce belief in fake news and help teachers to figure out new possible training activities for their students. Also, an important reflexion should be done about the importance of keeping ourselves continuously informed and up-to date. If, at the current state of research, projecting an efficient training course for teachers and students about fake news seems still a hard work, we should not underestimate the importance of keeping disseminate information about fake news and establish new alliances with the ones who live and work in the school context every day. By making leverage both on the spreading of the knowledge created with research all over the world and on the emotions that themes connected with the "long term risks" that fake news can generate (such as the one connected to the peril for democracy as we know it), we could be able to keep the school system level of attention high, having the chance to start help its actors – whether they are teachers or students – to build the armor they need not to fall for fake news.

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APPENDICES

APPENDIX 1 THE QUESTIONNAIRE

PART 1 – Tecnologie digitali e Educazione

A) Legga le frasi seguenti e valuti il Suo livello di accordo/disaccordo su una scala che va da 1 a 10 (1 =Fortemente in disaccordo,10=Fortemente in accordo)

	Fortemente in disaccordo → Fortemente in accordo									
A1) Sono in grado di supportare gli studenti nella elaborazione e nella gestione di informazioni apprese attraverso le TIC	1	2	3	4	5	6	7	8	9	10
A2) Sono in grado di supportare gli studenti nel presentare informazioni attraverso le TIC in modo sicuro e responsabile	1	2	3	4	5	6	7	8	9	10
A3) Sono capace di supportare gli studenti mentre lavorano in gruppo con le TIC	1	2	3	4	5	6	7	8	9	10
A4) Sono in grado di stimolare gli alunni a usare le TIC in modo critico.	1	2	3	4	5	6	7	8	9	10
A5) Sono in grado di offrire agli studenti l'opportunità di esprimere idee in modo creativo attraverso l'utilizzo delle TIC	1	2	3	4	5	6	7	8	9	10
A6) Sono in grado di selezionare le funzioni digitali più adatte per uno specifico setting educativo	1	2	3	4	5	6	7	8	9	10
A7) Sono capace di usare le TIC in modo appropriato per comunicare con gli studenti e le loro famiglie.	1	2	3	4	5	6	7	8	9	10

Informazioni e editoria

B) In questa scala dovrà valutare ciò che lei pensa dei mass media e di come loro divulgano le informazioni. Legga le frasi seguenti e valuti il Suo livello di accordo/disaccordo su una scala che va da 1 a 10 (1= Fortemente in disaccordo, 10= Fortemente in accordo)

	Fortemente in disaccordo → Fortemente in accordo									
B1) I proprietari dei gruppi editoriali influenzano i contenuti prodotti.	1	2	3	4	5	6	7	8	9	10
B2) Gli editori scelgono quali notizie pubblicare basandosi su ciò che attrarrà il maggior numero di persone	1	2	3	4	5	6	7	8	9	10
B3) Le persone possono trovare fonti di informazione che riflettono i loro valori politici	1	2	3	4	5	6	7	8	9	10

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B4) Le persone prestano più attenzione alle notizie che sono in accordo con le loro convinzioni piuttosto che a quelle che ne differiscono.	1	2	3	4	5	6	7	8	9	10
B5) La copertura mediatica di un candidato politico influenza l'opinione delle persone	1	2	3	4	5	6	7	8	9	10
B6) Le notizie sono costruite per attirare l'attenzione del pubblico	1	2	3	4	5	6	7	8	9	10
B7) I mass media dipingono i fatti in modo più drammatico di quanto non lo siano realmente	1	2	3	4	5	6	7	8	9	10
B8) Una notizia accompagnata da una buona fotografia ha più probabilità di apparire nei canali di informazione	1	2	3	4	5	6	7	8	9	10
B9) Una storia che parla di un conflitto ha più probabilità di ricevere alta esposizione mediatica	1	2	3	4	5	6	7	8	9	10
B10) Il primo dovere di un giornalista è rispettare la verità	1	2	3	4	5	6	7	8	9	10

PART 2 - Cosa definisce una Fake News?

A seguire, troverà alcuni esempi di fake news comparsi sui principali social media:

Uk: 800 bambini trattati con ormoni che bloccano la pubertà`

Oltre 800 bambini – alcuni dei quali di appena 10 anni – sono stati trattati con ormoni blocca pubertà` dal servizio sanitario nazionale del Regno Unito (NHS) per…

NEOVITRUVIAN.WORDPRESS.COM

I sette tentacoli del Governo Invisibile

Non credete alla menzongna che l'America sia un paese libero. Esiste un "governo invisibile" che controlla non solo gli Stati Uniti ma il mondo intero. Alcuni lo chiamano il "Nuovo Ordine Mondiale"…

NEOVITRUVIAN.WORDPRESS.COM

La carta d'identità del figlio è scaduta e i rigidi controlli del personale di servizio non hanno permesso ad un quattordicenne di salire a bordo del volo che avrebbe condotto lui e il papà da Catania in Grecia.

Ha il documento scaduto, papà abbandona il figlio in aeroporto e parte da solo | IxR

AttualitàHa il documento scaduto, papà abbandona il figlio in aeroporto e parte da solo Da Maurizio Spezia - 18/09/2017 0 di Edith DriscollLa carta d'identità del figlio…

INFORMAREXRESISTERE.FR

"Ho trovato il modo trasformare i rifiuti in petrolio, gas e carbone. E sto già producendo"

Parla l'ingegnere di Montichiari titolare di un brevetto che potrebbe rivoluzionare a breve il mondo…

YOUTUBE.COM

Troppi canguri in Australia, gli esperti: "Non basta la caccia, mangiateli" | IxR

AmbienteTroppi canguri in Australia, gli esperti: "Non basta la caccia, mangiateli" Da Pietro Di Martino - 18/09/2017 0 di Daniele ViceIn Australia i canguri sono il doppio…

INFORMAREXRESISTERE.FR

Vicenda raccapricciante a Moatize. Al giovane sono stati amputati gli arti e strappato il cervello. Aperta un'indagine per trovare gli aguzzini

Albini perseguitati in Mozambico: trovato il corpo mutilato di un 17enne | IxR

EsteriAlbini perseguitati in Mozambico: trovato il corpo mutilato di un 17enne Da Pietro Di Martino - 18/09/2017 0 Vicenda raccapricciante a Moatize. Al giovane…

INFORMAREXRESISTERE.FR

C) Di seguito sono elencate una serie di caratteristiche che possono essere utilizzate per descrivere le fake news. Le chiediamo di valutare in una scala che va da 1 (per nulla rilevante) a 10 (fondamentale), quanto secondo lei ciascuna di esse sia importante per definire una "fake news"

	Per nulla rilevante									Fondamentale
C1) L'intenzione di ingannare volontariamente il lettore	1	2	3	4	5	6	7	8	9	10
C2) La volontà di spostare l'opinione pubblica a beneficio di qualcosa/qualcuno	1	2	3	4	5	6	7	8	9	10
C3) Il fatto di viaggiare principalmente attraverso la rete	1	2	3	4	5	6	7	8	9	10
C4) Il fatto di apparire come una notizia vera	1	2	3	4	5	6	7	8	9	10
C5) Il fatto di essere divulgata per ottenere dei "click"	1	2	3	4	5	6	7	8	9	10
C6) Il fatto di contenere almeno una parte di verità	1	2	3	4	5	6	7	8	9	10
C7) Essere redatta da persone incompetenti	1	2	3	4	5	6	7	8	9	10
C8) Non avere fonti verificabili	1	2	3	4	5	6	7	8	9	10
C9) Essere diffusa da una specifica testata giornalistica o portale online	1	2	3	4	5	6	7	8	9	10
C10) Intenzione di manipolare le persone	1	2	3	4	5	6	7	8	9	10
C11) Notizie irrilevanti	1	2	3	4	5	6	7	8	9	10
C12) Notizie inventate	1	2	3	4	5	6	7	8	9	10
C13) Notizie non vere alle quali bisogna fare attenzione	1	2	3	4	5	6	7	8	9	10
C14) Notizie non vere spacciate allo scopo di disinformare	1	2	3	4	5	6	7	8	9	10

Altre caratteristiche rilevanti:

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Tesi di Dottorato di Roberta Sciannamea

PART 3 – Fake news e Educazione

D) Il tema delle fake news ci tocca come singoli individui e come docenti.

Legga le frasi seguenti e valuti il Suo livello di accordo/disaccordo con le seguenti affermazioni su una scala che va da 1 a 10 (1 = Fortemente in disaccordo, 10 = Fortemente in accordo)

Fortemente in disaccordo — Fortemente in accordo

D1) Mi sento perfettamente in grado di distinguere una news vera da una fake news	1	2	3	4	5	6	7	8	9	10
D2) Mi è capitato spesso di avere dubbi sulla veridicità di una notizia (è vera? è fake..?)	1	2	3	4	5	6	7	8	9	10
D3) Se ho dubbi rispetto alla veridicità di una notizia so come verificare	1	2	3	4	5	6	7	8	9	10
D4) Mi è capitato di credere a una notizia e scoprire che fosse fake	1	2	3	4	5	6	7	8	9	10
D5) Mi è capitato di pensare che una notizia fosse fake e scoprire poi che era reale	1	2	3	4	5	6	7	8	9	10
D6) Ai miei studenti posso spiegare senza difficoltà cosa sia una fake news	1	2	3	4	5	6	7	8	9	10
D7) Mi sento in grado di preparare i miei studenti a riconoscere le fake news e non lasciarsi imbrogliare da esse	1	2	3	4	5	6	7	8	9	10
D8) Se qualcuno dei miei ragazzi credesse a una fake news sarei in grado di fargli capire l'errore	1	2	3	4	5	6	7	8	9	10
D9) Ho elaborato una strategia per insegnare ai ragazzi come riconoscere le fake news	1	2	3	4	5	6	7	8	9	10

E) Per contrastare il fenomeno delle fake news quali strategie secondo lei si potrebbero adottare nell'educazione dei ragazzi?

Legga le frasi seguenti e valuti il Suo livello di accordo/disaccordo su una scala che va da 1 a 10 (1 = Fortemente in disaccordo, 10 = Fortemente in Accordo)

Fortemente in disaccordo — Fortemente in accordo

E1) Fare formazione agli insegnanti in entrata e in servizio su temi rilevanti per un utilizzo consapevole del web	1	2	3	4	5	6	7	8	9	10
E2) Strutturare dei percorsi specifici e fissi per ogni materia che mirino allo sviluppo delle capacità di pensiero critico da parte degli alunni	1	2	3	4	5	6	7	8	9	10
E3) Rinforzare la cultura di base degli studenti (storia, matematica, italiano…)	1	2	3	4	5	6	7	8	9	10
E4) Promuovere spazi specifici di sviluppo del pensiero critico a scuola, dedicati ai ragazzi di ogni fascia di età	1	2	3	4	5	6	7	8	9	10
E5) Potenziare le conoscenze informatiche dei ragazzi	1	2	3	4	5	6	7	8	9	10

E6) Limitare l'accesso dei ragazzi ai social network	1	2	3	4	5	6	7	8	9	10
E7) Aumentare la supervisione, da parte dei genitori, delle informazioni che i ragazzi ricevono	1	2	3	4	5	6	7	8	9	10
E8) Cambiare i sistemi di valutazione degli alunni, spostandoli dalla conoscenza dei contenuti alla capacità di rimodularli secondo la propria esperienza	1	2	3	4	5	6	7	8	9	10
E9) Non ritengo che quello delle fake news sia un problema che tocca gli studenti da vicino	1	2	3	4	5	6	7	8	9	10

F) Secondo lei, quale è il ruolo che il sistema scolastico dovrebbe avere nell'educazione contro le fake news?

Legga le frasi seguenti e valuti il Suo livello di accordo/disaccordo su una scala che va da 1 a 10 (1 = Fortemente in disaccordo, 10 = Fortemente in Accordo)

	Fortemente in disaccordo								Fortemente in accordo	
F1) Lasciare libertà agli insegnanti di affrontare l'insegnamento del pensiero critico come meglio ritengono	1	2	3	4	5	6	7	8	9	10
F2) Obbligare gli insegnanti all'adozione di testi scolastici che prevedano la messa in gioco di facoltà di tipo critico/riflessivo da parte degli alunni	1	2	3	4	5	6	7	8	9	10
F3) La scuola non ha il tempo e le risorse per occuparsi del problema delle fake news	1	2	3	4	5	6	7	8	9	10
F4) E' necessario cambiare i programmi scolastici, riservando spazi e tempi adeguati al contrasto delle fake news	1	2	3	4	5	6	7	8	9	10
F5) Si dovrebbe affidare a un docente specifico per ogni collegio di classe la responsabilità di definire unità di apprendimento su questo tema	1	2	3	4	5	6	7	8	9	10
F6) Il team di innovazione digitale è lo strumento adeguato per avviare iniziative di contrasto e risposta	1	2	3	4	5	6	7	8	9	10
F7) Somministrare periodicamente dei test che misurino la capacità di pensiero critico degli alunni a livello nazionale e transnazionale	1	2	3	4	5	6	7	8	9	10
F8) Ripensare tutto il sistema scolastico nazionale in funzione della digitalizzazione della scuola	1	2	3	4	5	6	7	8	9	10

Altre possibilità:

Part 4 – Scenario

H) Immagini di essere l'insegnante all'interno della situazione descritta nelle righe seguenti. Le chiediamo di immedesimarsi nella situazione presentata e di rispondere alle domande nel modo più sincero possibile.

Durante una discussione in classe, uno studente riferisce di aver letto online una terribile notizia: alcuni migranti avrebbero aggredito e picchiato un ragazzino italiano disabile fino a spezzargli una gamba.
La notizia ha fonti molto incerte ma scatena un conflitto tra gli studenti. Lei cosa penserebbe in questa situazione?

	Fortemente in disaccordo				Fortemente in accordo
COME SI SENTE					
H1 Incuriosito	1	2	3	4	5
H2 Preoccupato	1	2	3	4	5
H3 In ansia	1	2	3	4	5
H4 Impreparato	1	2	3	4	5
H5 Arrabbiato	1	2	3	4	5
H6 Stimolato	1	2	3	4	5
H6 Annoiato	1	2	3	4	5
H7 Sconcertato	1	2	3	4	5
H8 Dubbioso	1	2	3	4	5
H9 Insicuro	1	2	3	4	5
H10 Spaventato	1	2	3	4	5
Altro:					
ATTEGGIAMENTO:					
H11 Penso che questo tipo di discussioni non debbano avvenire in classe	1	2	3	4	5
H12 MI pare si tratti di un'ottima occasione di apprendimento	1	2	3	4	5
H13 Non mi sento in grado di gestire la discussione di queste tematiche	1	2	3	4	5
H14 Notizie di questo tipo mi producono scetticismo	1	2	3	4	5
H15 Penso di avere le capacità per gestire questo tipo di situazione	1	2	3	4	5
H16 Sono molto infastidito dal fatto che notizie di questo tipo vengano riportate senza saperne la fonte	1	2	3	4	5
H17 Penso che ogni studente deve essere libero di esprimere la propria opinione personale sulla notizia	1	2	3	4	5
Altro:					
COMPORTAMENTO	1	2	3	4	5
H18 Consiglio ai ragazzi di parlare con i genitori	1	2	3	4	5
H19 Stimolo una discussione sulle fonti della notizia	1	2	3	4	5
H20 Discuto in classe del tema oggetto della notizia	1	2	3	4	5
H21 Discuto in classe dei modi di valutare le informazioni che si trovano online	1	2	3	4	5
H22 Decido di pianificare un intervento più duraturo sull'uso di internet per la ricerca di informazioni	1	2	3	4	5
H23 Decido di fermare la discussione e di tornare al mio insegnamento	1	2	3	4	5
H24 Ricerco autonomamente la veridicità della notizia e il giorno dopo spiego ai ragazzi cosa ho trovato	1	2	3	4	5

	1	2	3	4	5
H25 Focalizzo il mio intervento sui temi del razzismo, della violenza e del rispetto delle disabilità					
H26 Stimolo una discussione sul rispetto reciproco					
Altro:					

PART 5 – Dato Socio-Anagrafici

Anno di nascita:		Sesso ❏Femmina ❏Maschio	
Studi	❏ Secondaria 1° grado ❏ Secondaria 2° grado	❏Laurea in:_____ ❏PhD	❏ Scuola di specializzazione (sostegno; TFA, SILSIS, etc) Altro:
Lavoro:	❏ Insegnante ❏Vice-Dirigente	❏Dirigente	❏Insegnante di sostegno ❏ Educatore
Comune della scuola in cui insegna:			
Livello Scuola di insegnamento	❏ Primaria ❏ Secondaria 1° grado	❏Secondaria 2° grado ❏ Scuola professionale	❏ Altro_____
Materia (è possibile segnalare più di una risposta)	❏Italiano/Storia della letteratura ❏Lingua straniera ❏Matematica	❏Scienze ❏ Storia/Filosofia ❏ Geografia	❏Educazione Fisica ❏Arte/Musica ❏Sostegno ❏Materie di indirizzo: _____
Tipologia scuola	❏ Pubblica	❏ Privata ❏ Privata paritaria	❏ Serale ❏ Diurno
Lei è	❏ Animatore Digitale	❏ Membro del Team d'Innovazione	❏ Nessuno dei due
Quali sono le sue principali fonti di informazione? (è possibile segnalare più di una risposta)	❏Telegiornale ❏ Radio ❏Quotidiani	❏Giornali ❏ Quotidiani online	❏ Social Network (Facebook, Twitter, Instagram, etc) Altro:_
Quale social network utilizzi con maggiore frequenza? (è possibile segnalare più di una risposta)	❏ Facebook ❏ Twitter ❏ Instagram	❏ Tumbler ❏ Pinterest ❏ Whatsapp	❏ Linked-in ❏ Nessuno Altro:_____

COD:

APPENDIX 2: NOTES ON THE "NO RESPONSE" ISSUE

A protocol that includes multiple contact attempts is critical to get higher response rates. Advance letters informing the respondent of their impending invitation to participate in the survey have also been demonstrated to improve response rates.

To maximize overall response rates, it is important to realize that choices of these influencing design factors are interrelated. The total survey design approach of Don Dillman and the leverage-salience theory of survey participation suggest that the factors may influence different respondents in varied ways. Thus, the point is not to define a set of rigid rules defining the survey recruitment process, but to recognize that many factors are at work and different combinations may be necessary to maximize overall response rates. If the goal is to maximize overall response rates, then a likely strategy involves "cherry picking" respondents, that is, targeting respondents with the highest propensity to respond (Brick, 2018).

Non response happens when there is a significant difference between those who responded to your survey and those who did not. This may happen for a variety of reasons, including:

- Some people refused to participate. This could be because you are asking for embarrassing information, or information about illegal activities.
- Poorly constructed surveys. For example, if you have a snail mail survey for young adults or a smartphone survey for older adults; both these scenarios are likely to lead to a lower response rate for your targeted population.
- Some people simply forgot to return the survey.
- Your survey didn't reach all members in your sample. For example, email invites might have disappeared into the Spam folder, or the code used in the email may not have rendered properly on certain devices (like cell phones).

- Certain groups were more inclined to answer. For example, people who are more active runners might be more inclined to answer a survey about running than people who aren't as active in the community.

Historically, researchers have found that lower-income members of the population are more likely to not respond to surveys. One researcher pinpointed single males as one group more likely to not respond.

Non-response bias is introduced bias in statistics when respondents differ from no respondents. In other words, it will throw your results off or invalidate them completely. It can also result in higher variances for the estimates, as the sample size you end up with is smaller than the one you originally had in mind. (https://www.statisticshowto.datasciencecentral.com/non-response-bias/)

A more scientifically valid approach to response rates is to focus on achieving the response rates that minimize nonresponse bias. This is a more difficult construct and harder to incorporate in a fair way into the survey requirements. However, there is considerable evidence demonstrating that response rates do not reliably predict nonresponse bias. Thus, instead of simply trying to maximize response rates or specifying a particular arbitrary and high response rate, survey clients should shift their focus to minimizing nonresponse bias (Brick, 2018).

Considerable evidence indicates that coverage error is a significant concern for web surveys. This coverage error manifests itself in the "digital divide" – the large number of substantial demographic and non-demographic differences between people with Internet access and those without (Tourangeau, 2018).

Measurement error is also influenced by mode; Couper (Chapter 5, in Groves et al. 2004) has proposed five features that help explain the impact of mode on measurement error:

1. The degree of interviewer involvement (e.g., mail and web feature low levels; CAPI high levels);
2. The degree of interaction with the respondent (e.g., eliciting opinions from a respondent vs. abstracting information from respondent records);
3. The degree of privacy (e.g., presence of interviewer, third parties, etc.);

4. Channels of communication (e.g., how questions are communicated to respondents and how they respond); and

6. Technology use (paper vs. computer).

Models of this type can be thought of as proposing mechanisms through which differences in mode may result in differences in the data. Similarly, Tourangeau and Smith (1996) have developed a model for how the data collection mode can affect various features of the data; the following version was adapted from Tourangeau et al. (2000) (Fig. 7.2). This model implicates three psychological variables that mediate the association between data collection mode and differences in the resulting data. The first is impersonality, which is how personal or impersonal the respondent perceives the survey interaction and context to be. The second is legitimacy, which is whether or not the survey and/or sponsor seem legitimate to the respondent. And the third variable is the cognitive burden of the survey response process for the respondent (Tourangeau, 2018).