COMPREHENSIVE RESEARCH REPORT

INFODEMICS
MEDIA LITERACY IN CRISIS

2021-1-LU01-KA220-YOU-000028874

May 2022

Co-funded by
the European Union

FORMATION ET SENSIBILISATION DE LUXEMBOURG

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EXECUTIVE SUMMARY

Young people all over Europe are facing the challenges presented by the digital era, which include the rise of misinformation and fake news. During the last year, in the context of the Covid-19 pandemic, youth and the whole population witnessed the health and wellbeing information increase among media communication channels, many times becoming victims of dis- and misinformation.

During the first phase of the **Erasmus Plus project 'Infodemics'** (project code: 2021-1-LU01-KA220-YOU-000028874), the partner organisations conducted research on the topic of misinformation related to health and wellbeing in digital contexts, focusing on youth as a target group. The partner organisations of the project and authors of this report are **Formation et Sensibilisation de Luxembourg** (Grand Duchy of Luxembourg), **Pontydysgu SL** (Spain), **SYNERGASIA ENEGON POLITON** (Greece) and **SwIdeas AB** (Sweden).

By providing information on the mentioned issues and analysing them further, this report also aims to explore the possibilities that the DigComp framework can provide in order to develop a more specific approach that serves youth in the enhancement of their digital competence in relation to health and wellbeing. This is done by developing competence statements for the DigComp framework that focus on the relevance of health and wellbeing in the midst of the vast amount of information available on the Internet. Additionally, the report also serves as a base for building up the next project results, as the created competence statements are being used for building a Self-Assessment Tool that provides young people with an overview of their own digital and media literacy competences in line with the DigComp framework, which already provides a common understanding of what digital competence is.

EUROPEAN OVERVIEW

As far as results are concerned, in the European context, our research identified that major issues encountered by youth in regards to digital misinformation in the health and wellbeing areas are such as being exposed to a large amount of information, often promoted by algorithms, marketing strategies or false experts. They also encounter challenges related to cybersecurity, cyberbullying, digital harassment and online violence. Besides, young people are often considered "digital natives", but truth is that the fact that young people were born with new technologies does not mean that they inherently know how to use them safely.

In this context, youngsters need to develop their digital skills to be able to navigate the Internet with safety and preserve both their physical and mental health. For that matter, learning how to fact-check, becoming a critical thinker, learning about media literacy, using a variety of sources of information, communicating with others about the challenges one is facing in online environments and being aware of making correct use of the digital tools is crucial.

Taking all the mentioned into consideration and after conducting all the necessary research both in the partner countries and at the European and international levels, the partner organisations have thoroughly developed DigComp competence statements with the will to support youth in the enhancement of their digital competence and the preservation of their health while being exposed to digital environments.

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INTRODUCTION

1) Introduction

The relevance of Media and Information Literacy (MIL) is increasing very significantly in recent times. In the light of the Covid-19 pandemic crisis, the need for literacy around health and wellbeing information became apparent. Yet, close to one fifth of young Europeans struggle with using digital tools and handling information and data in everyday life according to the new skills agenda for Europe.

The European Commission recognises that media literacy and digital skills have never been as important as in today's society. For that matter, the **DigComp Framework** was developed. This framework was created by the Joint Research Centre (JRC), the European's Commission science and knowledge service[1], as a scientific project and with intensive consultation of stakeholders.

As described by the JRC[2]: "*The Digital Competence Framework for Citizens, also known as DigComp, provides a common language to identify and describe the key areas of digital competence. It is an EU-wide tool to improve citizens' digital competence, help policy-makers formulate policies that support digital competence building, and plan education and training initiatives to improve the digital competence of specific target groups*.".

First published in 2013, DigComp has become a reference for the development and strategic planning of digital competence initiatives both at European and Member State levels. So far, there have been three updates, DigComp 2 published in 2016, DigComp 2.1 published in 2017, and DigComp 2.2. published in 2022, which are extending the range of competences and the examples of practice.

As a general framework, DigComp can be extended to develop more specific approaches for particular users and focused on particular competence areas. In this context, this **Comprehensive Research Report** intends to develop new health-related statements for selected competences of the 5 competence areas of the DigComp 2.2 framework, with the goal of bolstering the health and wellbeing aspects of it in relation with media and information literacy and taking into account the needs of youth. For that matter, the Report first addresses the characterisation and understanding of the digital capabilities of youngsters, focusing on data literacy, information, health and wellbeing.

Hence, the Report is based on a literature review, a survey questionnaire and interviews that sought to identify the challenges, gaps and best practices in developing the competences and skills needed by young people to access and to critically analyse media based on a number of key concepts leading to an evaluation based on that analysis.

Specifically, the report starts analysing the issues associated to dis- and misinformation in the digital contexts, especially focusing on that information related to health and wellbeing. Subsequently, it explores the gaps of young people's abilities to use digital tools and handle information. Additionally, several best practice examples on how to improve youngsters' digital abilities in relation to health and wellbeing are presented. After presenting the mentioned points, the authors reflect on the needed competences and skills that young people need to acquire and/or enhance in order to navigate the digital environments in a healthy and

[1] EU Science Hub (2022). European Commission. Available at: https://joint-research-centre.ec.europa.eu/index_en (Accessed: 3 June 2022)
[2] DigComp 2.2. (2022) JRC Publications Repository. Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC128415 (Accessed: 3 June 2022)

successful manner. Lastly, based on the previous reflections, the new DigComp competence statements are proposed.

This Comprehensive Research report is part of the **Erasmus Plus "Infodemics" project** (project code: 2021-1-LU01-KA220-YOU-000028874). The term 'infodemic' stems from the Covid-19 pandemic and is defined by the WHO (2020)[3] as an overabundance of information—some accurate and some not—that makes it hard for people to find trustworthy sources and reliable guidance when they need it. The overall goal of Infodemics is to assist young people across Europe to better deal with the expanse of digital information and misinformation targeted towards them in relation to health, mental health, wellness and wellbeing. Thus, one of its specific objectives is to make use of the DigComp in order to develop more specific approaches that serve youth in the development of their digital competences in relation to health and wellbeing. Although Infodemics firstly intended to work with DigComp 2.1, DigComp 2.2 was released while this report was being written. Hence, the authors decided to use the most updated version of the framework.

[3] Managing the COVID-19 infodemic (2020). World Health Organisation. Available at: https://apps.who.int/iris/bitstream/handle/10665/334287/9789240010314-eng.pdf (Accessed: 28 March 2022)

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METHODOLOGY

2) Methodology

For developing this comprehensive report, each of the four partner organisations contributing to it (Formation et Sensibilisation de Luxembourg, Pontydysgu SL, SYNERGASIA ENEGON POLITON and SwIdeas AB) firstly conducted national research in their respective countries (Luxembourg, Spain, Greece, and Sweden) and developed their own national research reports. This comprehensive report brings together the main findings of the four national reports of the mentioned contributors and adds the international aspect to the content and a transnational analysis focusing on the European context.

The methodology used by the four organisations for collecting information included the conduction of interviews, surveys, and desk research, all of them conducted between February and March 2022.

a. Interviews:

Each partner interviewed young people and/or stakeholders in their national contexts. The aim of the interviews was to collect information about the perception that young people and stakeholders, who directly work with youngsters, have in regards to health information and misinformation, especially in the digital context. The number of interviews is as it follows:

Sweden:

- 5 young people, mostly university students between 22-29 years old
- 4 stakeholders, one university professor, one coordinator of an NGO, one teacher of primary and secondary school and a freelance trainer.

Greece:

- 4 stakeholders, all of them being language teachers working with youngsters

Spain:

- 4 young people under 25 years old
- 3 stakeholders, all of them being people working in the field of youth and education

Luxembourg:

- 3 young people, mainly high school and university students between 22-29 years old
- 5 stakeholders, one representative of the Ministry of Youth of Luxembourg, a Luxembourg-based high school employee, and three NGO representatives.

b. Surveys:

The survey has been shared in a Google form questionnaire format, in both English and in the partner languages. The goal was to collect information regarding individuals' digital skills and their experience when reading up on information available online, especially in the areas of health and wellbeing. The questions were very reflective, and participants were asked to respond to them as truthfully as possible.

Sweden:

- 22 people responded the questionnaire. Respondents included both young people between 18-30 years old (86.3%) and stakeholders between 31-50 years old (13.7%).

Greece:

- There were 13 respondents. Their age range was fluctuated from 18 to 50 years old.

Spain:

- The questionnaire was completed by 11 young people and 4 stakeholders.

Luxembourg:

- There were 12 respondents. Respondents included both young people between 18-30 years old (41.6%), 26-30 years old (25%) and stakeholders between 31-50 years old (33%).

c. Desk research:

As for the desk research, a diverse range of different sources were checked from the Internet, including articles, reviews, topic-related websites, publications, blogs, research studies and the European Projects Results Platform (EPRP).

The sources tackled topics related to misinformation, disinformation, "fake news", digital skills, the usage of digital tools, MIL (Media and Information Literacy), youth work, health and wellbeing. We also collected some best practices on the mentioned topics to illustrate possible ways of acting upon the challenges presented in this report.

Following the line of the report's topic on misinformation and disinformation, the desk research put efforts in providing truthful information from verified sources, giving especial consideration to those including evidence-based knowledge and demonstrating a clear scientific methodology. All the sources of information can be found in the "References" section.

After collecting all the necessary information, analysing it and building the national research reports, the partners developed new, innovative statements for 13 competences defined in the DigComp 2.2 framework with the goal of bolstering the health and wellbeing aspects of it. The 13 competences were chosen taking into account the results and discoveries made during the research phase and shown on this report.

The statements can be found in section 7) New DigComp Competence Statements of this document.

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THE ISSUES ASSOCIATED WITH MISINFORMATION, DISINFORMATION AND 'FAKE NEWS' IN THE HEALTH AND WELLBEING CONTEXTS

3) The issues associated with misinformation, disinformation and 'fake news' in the health and wellbeing contexts

Misinformation, disinformation and "fake news" play a very important role when it comes to health and wellbeing. Defining these terms can be a complex task. For the purpose of this article, we can define health misinformation as information that is contrary to the consensus of the scientific community regarding a certain phenomenon. Disinformation is a deliberated effort to circulate misinformation in order to gain money, power, or reputation. Nevertheless, discerning between disinformation from misinformation can be very difficult.

Besides, it is important to note that we can get information from a multitude of places: knowledge regarding health and well-being is cobbled together from health care professionals, family, friends, books, newspapers, magazines, educational pamphlets, radio, television, and pharmaceutical advertisements. However, we are increasingly using online searches for answering our questions rather than pursuing information through the other mentioned sources. Although some individuals are less likely to get health information from the Internet, such as older adults and those with less education and income, there is no doubt that the Internet has democratized medicine. Approximately 5% of all Internet searches are health related. Although most individuals report that search empowers their decision-making regarding health issues, the first challenge to finding online information is often choosing the correct symptoms or diagnosis to search for in the first place.[4]

Hence, the Internet became a highly used resource for people to learn about health and investigate one's own health condition. It is true that individuals have always obtained information from outside the formal health care system, but the Internet changed people's engagement with health information.[5] For instance, in Sweden, 50% of our survey respondents admitted they would search on Internet for their symptoms, against 27.3% who said they would call a doctor right away when feeling sick. The numbers are different when it comes to Luxembourg, where 65% of the respondents would call the doctor right away and 35% would look for online information. In Greece, 38% of the people would call a doctor whereas 30% would ask someone from their environment for help (family, friends, etc.). In Spain, respondents are more likely to go to the doctor first, but they would be eager to get a second diagnose either by asking a friend/relative or by consulting the Internet. Despite these differences between countries, it is worth-mentioning that many of the stakeholders interviewed for this research stated that the youngsters search a lot on the web for information regarding their health and well-being by placing the keywords of the symptoms on the search bar and reading non-critically the results that come up from the search.

Confirmation bias

As Briony Swire-Thompson and David Lazer Keselman explain in another of Keselman's publications[6], a group of researchers investigated online health information-seeking. They

[4]Swire-Thompson, B. and Lazer, D. (2020) *Annual Review of Public Health - Public Helath and Online Misinformation: Challenges and Recommendations*. Vol. 41:433-451. Available at: https://www.annualreviews.org/doi/10.1146/annurev-publhealth-040119-094127 (Accessed: 13 March 2022)

[5] Swire-Thompson, B. and Lazer, D. (2020) *Annual Review of Public Health - Public Helath and Online Misinformation: Challenges and Recommendations*. Vol. 41:433-451. Available at: https://www.annualreviews.org/doi/10.1146/annurev-publhealth-040119-094127 (Accessed: 13 March 2022)

[6] Keselman A. et al. (2008). *Consumer health information seeking as hypothesis testing*. J. Am. Med. Inform. Assoc. 15(4):484–95

asked laypeople to read a hypothetical scenario regarding a relative who was experiencing chest pain and subsequently search the internet for information. In the beginning, incorrect knowledge often led people to search for information on irrelevant websites (non-official ones) and to seek out data that would confirm their initial incorrect hypothesis. This is known as confirmation bias. It happens when individuals selectively expose themselves to evidence that supports prior beliefs. Confirmation bias is problematic because it is possible to find evidence to support many different hypotheses online, particularly in fields such as health and nutrition.

Lack of trust and inaccurate information

Generally, we do not possess the cognitive capacity, motivation, or time to evaluate all the information that we can find online. However, motivation seems to increase when we are to research a topic regarding our own health condition or symptoms. Yet, the assessment of source reputability and the veracity of information is a difficult task. Moreover, the Internet is a fluid, ever-changing system. In fact, 90% of the whole world's data had been created in the previous 2 years in 2017, which means that almost all the world's existing data was created in only 2 years. The output of data was roughly 2.5 quintillion bytes a day. Nowadays, these numbers are likely to be much higher as the digital world expands rapidly.[7] That makes the task of finding trustable information even more difficult.

As there is a large amount of inaccurate information online, people can easily be misinformed. For example, in a quick Google search one can find that eating apricot seeds will cure cancer[8]. There is no scientific evidence to support that statement. In regards to the Covid-19 pandemic, and as one interviewee expressed "*From the start of the COVID-19 Pandemic, information relating to health became more prevalent than ever before in our media and social media streams. Official guidance changed weekly as the situation unfolded with restrictions varying even at local level. It became increasingly more difficult for the average person to keep up with the barrage of information from government and from health authority sources and all of this was mixed in with a high level of misinformation and alternative narratives around the causes, effects, preventions and cures for the virus and its symptoms.*".

Then, how can we identify the trustable sources of information? Formal institutions are the most trustworthy to majority of the population. Nevertheless, they are increasingly challenged by the rise of non-official sites and individuals that act as "expert patients". These are patients who expose their experience as if it would be scientifically proven, although it might not be.

As one of our Spanish interviewees explained in relation to the increase of health information we all experienced during the Covid-19 pandemic *"when you ask about knowing if we can trust what we are reading, it's no longer a matter of checking if it [information] comes from a verified source or is peer reviewed, I genuinely don't know who to trust at the moment".* The ability to judge whether or not someone is qualified or experienced enough to provide information we seek is an important competence when navigating media.

It is also a fact that when people are scared or doubtful, as it usually happens in the midst of disease, their susceptibility to misinformation increases. When false information achieves acceptance and becomes a belief, it is difficult to change. Still, the capability to step back and

[7] International Journal of Media and Information Literacy (2018) *Cyberleninka*. Available at: https://cyberleninka.ru/article/n/media-literacy-and-critical-thinking/viewer (Accessed: 29 March 2022)
[8] Jimenez, A. (2022) *Fighting Cancer with Apricot Seeds – Templeton Wellness Foundation.* Available at: https://templetonwellness.com/articles/fighting-cancer-with-apricot-seeds/ (Accessed: 10 March 2022)

re-evaluate the information will vary depending on the individual's personality, literacy and socio-demographic characteristics.[9]

False information spreads fast and far

We need to be aware that misinformation and disinformation are introduced online by many different sources: vested interests, politicians, news media, gossip, and works of fiction. Vosoughi et al.[10] tracked 126,000 rumours spread by more than 3 million people on Twitter. They discovered that false information diffused farther and faster than true information. Apparently, similar outcomes were found in studies focusing on health misinformation. Vosoughi et al. hypothesized that the reason that false information diffused faster than true information was that the first elicited more disgust, fear, and surprise. It is also interesting to note that Goel et al.[11] found out that broadcasted information (the one shared by influential accounts such as big news channels or famous people) spreads much farther than information going through viral cascades (from one person to another). In fact, as stated by Yuxi Wang et al. In the article *Systematic Literature Review on the Spread of Health-related Misinformation on Social Media*[12] *"Even internet memes that are described as spreading virally also often receive substantial media coverage. This finding suggests that individuals and corporations with large social media audiences have a greater responsibility to check that the health information they are sharing is correct. It also suggests that encouraging individuals with high follower rates to share corrective or high-quality information could be an effective strategy to reduce the spread of misinformation*.".

It is also interesting to see the results of the *Prevalence of Health Misinformation on Social Media: Systematic Review*[13]. This systematic review intended to identify the main health misinformation topics and their popularity on different social media platforms. A total of 69 studies were reviewed. They found out that health misinformation was most prevalent in studies related to smoking products and drugs such as opioids and marijuana (reaching up to 87% of misinformation). Misinformation about vaccines was also high (43%). Health misinformation related to diets and nutrition was around 36% while misinformation related to non-communicable diseases and pandemics reported rates of 40%, especially in the case of cancer. Finally, the lowest levels of health misinformation were related to medical treatments (30%).

How is misinformation influencing people's health?

So now that the patient can have an active role in consuming and evaluating health information, can we assess if the access to this information is helping or hindering people?

First, we need to know if individuals are checking official websites/e-sources or non-reliable ones. 45.5% of our Swedish survey and interviews respondents expressed that they would look first at interesting links they found googling their symptoms. Only a 27.3% said they would check official health websites. As for Greece, 39% said they check the government's health services website, whereas for Spain, this percentage is right below 50%.

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[9] Wang, Y. et. Al. (2019) *Systematic Literature Review on the Spread of Health-related Misinformation on Social Media, Social Science & Medicine*. Vol. 240. Available at: https://www.sciencedirect.com/science/article/pii/S0277953619305465 (Accessed: 20 March 2022)

[10] Vosoughi, S. et. Al. (2018) *The spread of true and false news online*. Science 359(6380):1146–51

[11] Goel, S. et. Al. (2016) *The structural virality of online diffusion*. Manag. Sci. 62(1):180–96

[12] Wang, Y. et. Al. (2019) *Systematic Literature Review on the Spread of Health-related Misinformation on Social Media, Social Science & Medicine*. Vol. 240. Available at: https://www.sciencedirect.com/science/article/pii/S0277953619305465 (Accessed: 20 March 2022)

[13] Suarez-Lledo, V. and Alvarez-Galvez, J. (2021) *Prevalence of Health Misinformation on Social Media*: Systematic Review. https://www.jmir.org/2021/1/e17187/ (Accessed: 21 March 2022)

Second, we need to discover if people can come to the correct health conclusions themselves. Lastly, we have to overcome the challenge of evaluating if people's decisions made upon that information causes them any harm.

A Pew Research Center report[14] found that only 3% of people reported being harmed, or reported knowing someone who has been harmed, by information found online. However, this data might not be accurate as it is possible that some individuals are not evidently harmed or that they do not exactly recall being harmed because of the information itself. Hence, the true magnitude of harm is likely to be higher simply due to the reported rates of people seeking online, unofficial medical advice.

Another way that misinformation can affect health is by increasing uncertainty, stress and anxiety. Feeling unable to distinguish facts from misinformation fuels psychological distress[15]. This means that health misinformation can not only have a negative effect on society by spreading false information, but also by causing mental discomfort through the diffused content.

Depending on the individual's (often) unconscious evaluation of the situation, people respond to stressful situations with either an adaptive (challenge) or maladaptive (threat) response. These can lead to physical and mental health implications, such as poor mental health or cardiovascular disease[16].

Last but not least, it is worth mentioning that close to 100% of our survey respondents explained they like to read information and communicate through social media. Nevertheless, the fact that fake news are very common on social media is well known. Hence, the aforementioned consequences that health misinformation can have on individuals is likely to increase on the social media contexts, even if, according to our research, there seems to be general awareness on the fact that social media can contain big amounts of inaccurate information.

[14] Fox, S. and Duggan, M. (2013) *Health online*. Pew Res. Cent., Internet Technol.

[15] Leung, J. et. Al. (2021) *Concerns over the spread of misinformation and fake news on social media – challenges amid the coronavirus pandemic*. In Proceedings of the 3rd International Electronic Conference on Environmental Research and Public Health. MDPI AG, Basel. (p. 1-6). Available at: https://doi.org/10.3390/ECERPH-3-09078 (Accessed: 22 March 2022)

[16] Walton, G. (2021) *Fake news is bad for society, but could it also be bad for your health?* Available at: https://www.mmu.ac.uk/news-and-events/news/story/14671/ (Accessed: 25 March 2022)

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YOUNG PEOPLE'S ABILITY TO USE DIGITAL TOOLS AND HANDLE INFORMATION – GAPS AND NEEDS

4) Young people's ability to use digital tools and handle information – Gaps and Needs

The goal of this section is to identify gaps and needs in young people's abilities to use digital tools and handle information in a way that will allow them to preserve health and safety while being in digital information contexts, leaving aside negative feelings of anxiety, fear or exclusion.

In this regard, it is interesting to first understand how false beliefs based on misinformation can be created by an individual.

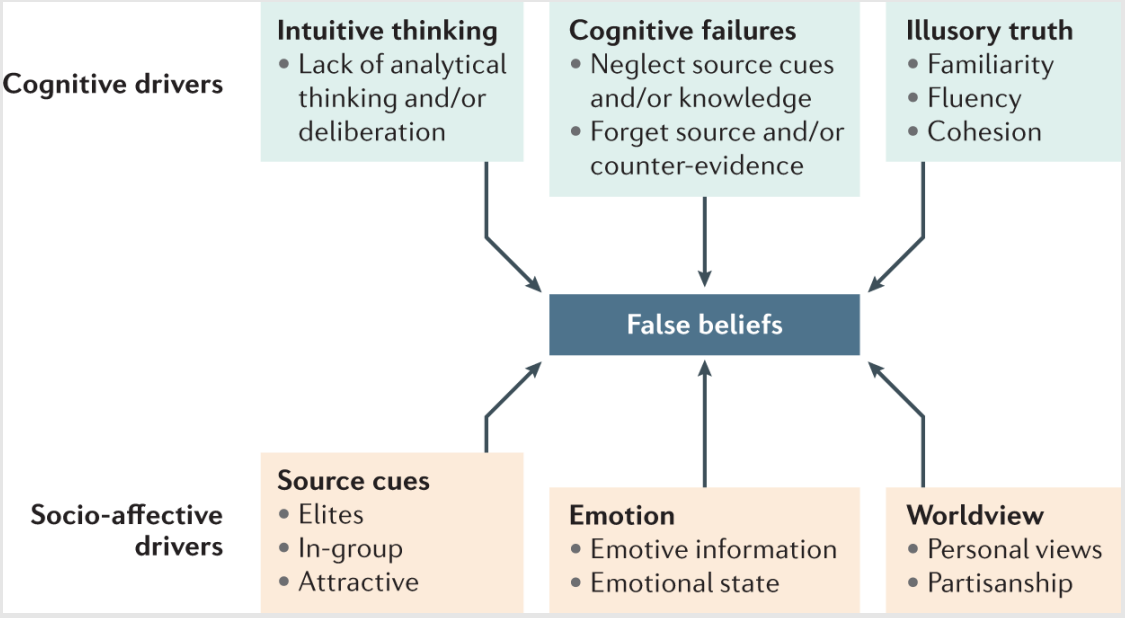

Figure 1. Source: https://www.nature.com/articles/s44159-021-00006-y

As demonstrated by the previous figure, a wide range of cognitive, social and affective factors influence the formation of false beliefs, from lack of analytical thinking to the emotional state or previous belief systems that influence our personal views. Individuals are often biased to believe in the validity of information, "going with their gut" and intuition[17]. A connection has also been found between intuitive thinking and greater belief in COVID-19 being a fraud, as well as diminished compliance with public health measures.[18]

It is also relevant to take into account the information source. Generally, messages seem more trustable to us when they transmit information that matches our opinions and perspectives, when they come from in-group members or from sources that we consider credible, even if they might not be (e.g., experts and political elites are believed by many due to their power to shape the public's perceptions). Hence, as previously mentioned, it is especially damaging when leaders with many followers spread misinformation, something that commonly happens in social media.

[17] Ecker, U. et. Al. (2022) *The psychological drivers of misinformation belief and its resistance to correction.* Available at: https://www.nature.com/articles/s44159-021-00006-y (Accessed: 18 March 2022)

[18] Stanley, M. L. et. Al. (2020) *Analytic-thinking predicts hoax beliefs and helping behaviors in response to the COVID-19 pandemic*. Think. Reas. 27, (pp. 464–477)

Youth prefer social media

During the Covid-19 pandemic, in general, the television, the online press and institutional websites seemed to be on the top of the ranking for people to get health information and they were also among the most trusted ones.

Nevertheless, most of our surveyed and interviewed youngsters admitted using social media the most among all digital tools, with some differences on the preferred platforms. For instance, Spanish people use WhatsApp and Telegram more, whereas in the other countries Instagram, Facebook or Twitter are more commonly used. Yet, paradoxically, young people generally do not trust social media as an information source and use it mainly for entertainment or finding community support. Hence, when youngsters need to gather information about a certain topic, they actually prefer to search for it in Google or Google Scholar. However, and especially in terms of health and wellbeing, this can drive them towards false experts' opinions, blogs and forums. Still, some of our respondents reported checking official websites or having some preferred specialized websites they usually use for health and wellbeing issues. They might also ask their relatives and friends for their opinion, besides going to the doctor when symptoms worsen. Depending on the country, people are more or less eager to look for health-related advice on Internet. For instance, in Sweden, a highly digitalized country, people seem more eager to do so whereas in the other countries people prefer to seek for a doctor's advice from the beginning and use Internet as a secondary option. In Luxembourg, during the pandemic, the services provided by the health sector were free of charge, which can be one of the reasons why people have more trust in doctors[19].

Identified gaps for youth's digital skills

In order to fight the spread of misinformation in the digital world, encouraging people to approach the information critically is key. When asking people to judge whether a statement is true, makes them think further and prevents them from subsequently accepting misinformation as true facts. It is also important to teach individuals to **check the veracity of the information sources.** Our interviewed individuals explained that they believe the most important digital skills they are lacking are such as how to **choose reliable sources** and how to **narrow down important information** from the huge amount of data the online world offers, which has to do with **critical thinking**, media and information literacy as well as with accessibility, visibility and **fact-checking**.

Here is some data that can deepen our understanding on the subject. For instance, 30% of our Greek respondents said that they do not often validate the accuracy of the resource. Interestingly, the same exact percentage (30%) on the other side does. In general, young people expressed their awareness on the fact that there is plenty of misinformation and fake news on the Internet, and especially on social media. Nevertheless, the majority of them still do not spend time on fact-checking the veracity of what they read on social media, although they seem to fact-check more often when reading articles.

Furthermore, the stakeholders interviewed for this report agreed that although, in general, youngsters do not know how to correctly fact-check or they do not wish to spend time in fact-checking the information they read unless it is very relevant to them, youth with higher education are more eager to fact-check as they learn to research information during their studies. Apparently, young people from poorer socio-economic backgrounds have poorer

[19] Luxembourg Trade & Invest. (2020) *Luxembourg: Effective management of the COVID-19 health crisis*. Available at: https://www.tradeandinvest.lu/news/luxembourg-effective-management-of-the-covid-19-health-crisis/ (Accessed: 22 March 2022)

digital skills[20] and prefer face-to-face interactions, often due to their limited accessibility to digital tools and/or negative experiences in the digital world related to bullying, harassment or other online adverse experiences. Limited digital skills make youngsters more prone to cyberbullying[21].

On the other hand, the Eurostat data published in *Being young in Europe today*[22] (section 7, Digital world) explains that 91% of youngsters in the EU used the Internet daily in 2016, compared with 71% for the whole EU population. Additionally, it appears that the highest proportion of daily internet users by Eurostat was recorded among youngsters aged between 16 and 19 years and among those with a higher level of formal education. Generally, there is an **excessive usage of Internet by youth**, which can derive in addictive behaviours.

Yet, only 1% of youth have never accessed the Internet, while 95% use it on daily basis and 89% prefer to use mobile devices to access it. When it comes to the use of digital tools, there is a high preference for using these for **entertainment and communication**, including the engagement in social networks, despite the supposition of the increase in the usage of digital tools for formal and non-formal education activities during the COVID-19 pandemic. As research shows, only 13% of young people have participated in educational activities and just 10% have done an online course on any subject *(Ibid, p. 19).*

Hence, the identified digital challenges and skills' gaps are:

- excessive use of the Internet,
- lack of critical thinking,
- lack of fact-checking (whereas it is due to lack of knowledge on how to do so or due to the unwillingness to spend time on fact-checking),
- using Internet mainly for entertainment purposes,
- using mostly social media, not consulting other information tools (i.e., online press, specialized websites, traditional media, etc.)
- lack of knowledge on how to analyse and verify information.

Digital natives

Furthermore, the widespread consumption of new technologies among youth has created the false paradigm of the "digital native". This paradigm assumes that just because young people have grown up with digital technologies, they will know how to correctly use them by default *(Ibid, p. 18)*. But as we are seeing, this is far from true. The ICDL Foundation[23] highlights that "young people do not inherently possess the skills for safe and effective use of technologies, and skills acquired informally are likely to be incomplete". Thus, there are important gaps in

[20] Scheerder, A. et. Al. (2017) *Determinants of Internet skills, uses and outcomes. A systematic review of the second-and third-level digital divide*. Telematics and Informatics, 34(8), 1607–1624. Available at: https://doi.org/10.1016/j.tele.2017.07.007 (Accessed: 17 March 2022)

[21] Serban A. M. et. Al. (2020) *Social Inclusion, Digitalisation and Young people. European Union and Council of Europe*. (pp. 40-44). Available at: https://pjp-eu.coe.int/documents/42128013/47261953/053120+Study+on+SID+Web.pdf/0057379c-2180-dd3e-7537-71c468f3cf9d (Accessed: 14 March 2022)

[22] Eurostat – Statistics Explained (2020) *Being young in Europe today*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Being_young_in_Europe_today (Accessed: 17 March 2022)

[23] ICDL Europe (2014) *The fallacy of the "digital native".* Available at: https://icdleurope.org/policy-and-publications/the-fallacy-of-the-digital-native/ (Accessed: 21 March 2022)

digital skills education for youth, which should enable them to minimise the risks and maximise the benefits of engaging in the online world. For using digital tools, digital skills education is required, especially in the field of safety, but as already seen, significant gaps can still be identified in the form of accessibility, skills, equal opportunities and types of services available and provided[24].

The digital challenges of youth

The most noteworthy challenges identified on this research that youth can encounter in digital environments and which they would need to overcome by acquiring the necessary knowledge and competences, are:

- Exposure to biased information, often promoted by algorithms and marketing strategies. Youngsters often do not know how these work and how they can influence their point of view.
- The spread of disinformation and misinformation through a diverse range of digital means, including peers, leaders (politicians, famous people, etc.), media or false experts.
- The assumption of youngsters being "digital natives".
- Cybersecurity, violation of privacy, hacking and lack of legislation and mechanisms to protect the users.
- Insufficient digital skills and limited access to digital tools.
- Insufficient knowledge about how to navigate and participate in online chats/interactions.
- Insufficient free, accessible, effective education for improving digital skills and media literacy, both formal and non-formal.
- Insufficient education of the educators who would need to provide young people with the necessary digital competences (critical thinking, media literacy, comparing information, researching trustful sources, fact-checking, using safety online measures/tools, etc.).
- Lack of spaces and competence for talking about our digital lives in offline settings.
- Risk of addiction and excessive time in online environments which can cause health problems.
- Risk of cyberbullying, harassment, social exclusion and online violence which can damage physical and mental health.

The bright side

Yet, digital tools are also having positive effects on young people and their health, such as:

- the elimination of physical barriers;
- access to less costly training/knowledge;
- increased cooperation and communication which can be beneficial for the social, personal and professional development of the youth[25], as they are able to easily talk to their peers online, expressing themselves, sharing personal stories, enhancing their networks and learning about each other;

[24] Serban A. M. et. Al. (2020) *Social Inclusion, Digitalisation and Young people. European Union and Council of Europe*. (p. 17). Available at: https://pjp-eu.coe.int/documents/42128013/47261953/053120+Study+on+SID+Web.pdf/0057379c-2180-dd3e-7537-71c468f3cf9d (Accessed: 14 March 2022)

[25] López Peláez, A. et. Al. (2020) Young people, social workers and social work education: the role of digital skills. (p. 3). Available at: https://www.tandfonline.com/doi/abs/10.1080/02615479.2020.1795110?journalCode=cswe20 (Accessed: 15 March 2022)

- potentially bypassing fear of contact among youngsters (especially of those in need of professional help)[26];
- the possibility to enhance creativity and other skills one can learn online;

As a matter of fact, it has been proven that young people from minority backgrounds consider digital sources of great importance when trying to overcome stressful situations such as having relationship issues or feeling sad/depressed, as well as when learning how to discuss in a peaceful way with people who have different opinions. As digitalisation allows interaction and communication between groups that might otherwise be more disconnected or isolated, youngsters from minority backgrounds find clear advantages on this form of communication *(Ibid, p. 20)*.

Additionally, recent studies revealed that young people made use of various ways and digital tools regarding their mental health in the first lockdown of the COVID-19 pandemic during 2020[27]. Both formal and informal resources were used. Young people engaged themselves in self-help behaviors through multiple digital tools to aid their mental health and well-being in general. Such tools suggest:

1. The usage of formal services established by charities or health care services
2. Special mental health apps
3. Diverse social media platforms relevant to supporting mental health (e.g., Facebook, YouTube, TikTok, Instagram, etc.)
4. Instant messaging apps, like Messenger and WhatsApp,
5. and search engines (i.e., Google) to seek for relevant to the topic pages and websites.

More specifically, social media platforms were used for different purposes each by youngsters. For instance, they tended to use Instagram to watch and keep track of influencers whose main topic was mental health. Facebook was mainly used for support and daily communication, and Google to seek for "recommendations from peers and prior knowledge of services played a role in how resources were located".

[26] Serban A. M. et. Al. (2020) *Social Inclusion, Digitalisation and Young people. European Union and Council of Europe*. VOL. 39, NO. 6, 825–842 (p. 42). Available at: https://pjp-eu.coe.int/documents/42128013/47261953/053120+Study+on+SID+Web.pdf/0057379c-2180-dd3e-7537-71c468f3cf9d (Accessed: 14 March 2022)

[27] Pretorius, C., & Coyle, D. (2021). Young People's Use of Digital Tools to Support Their Mental Health During Covid-19 Restrictions. *Frontiers in Digital Health*, *3*. https://doi.org/10.3389/fdgth.2021.763876

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BEST PRACTICES

5) Best Practices

Despite the above-mentioned challenges society faces with health and wellbeing misinformation in the digital context, there are already many good practices and examples that are trying to eradicate them. Next, we are presenting some of them in different national contexts. If you would like to discover more best practices, feel free to check Annex 1.

Best practices in the Luxembourgish context

Digital4Education[28]

In 2015, the Minister of Education, Childhood & Youth unveiled Digital4Education, a strategy for developing skills & know-how fit for the 21st century. Its mission is to prepare young people for a professional landscape of rapid & permanent change. It aimed to enable students to develop the skills necessary for the appropriate and responsible use of ICTs and promote innovative pedagogical projects using digital technology in schools.

The Digital (4) Education strategy defines educational challenges which are to:

- Give all students equal access to ICT tools and use the potential of ICT to address the different needs of students
- Promote the use of ICT in education (formal & non-formal) and integrate ICT-related skills into the curriculum
- Contribute to a national effort and adapt the education system to the demands of the labour market
- Develop and strengthen skills in the following fields: communication, collaboration, creativity, well-being, understanding of the world and the society and critical thinking.

The Digital4Education strategy is built around five dimensions for which specific projects are developed to ensure that the participating schools have the necessary tools (software, hardware, teaching resources, teaching scenario, digital learning environments, etc.) to create learning situations promote the development of 21st-century skills.

The five dimensions and the corresponding objectives are:

- Digital Citizen: prepare students and future citizens to live in a world where technologies play an ever-increasing role
- Digital Peer: promote a secure and responsible use of ICT technologies
- Digital Learner: provide teachers and pupils with the necessary resources (learning tools, software, multimedia resources, etc.) to create appropriate learning situations
- Digital Worker: give young people the skills required to manipulate the basic technological tools (preferably in a 'cloud' environment) in their daily working lives in order to be creative and productive

[28] Digital4education (2022). Le Gouvernement de Grand-Duché de Luxembourg. Available at: https://digital-luxembourg.public.lu/initiatives/digital4education (Accessed: 21 March 2022)

- Digital Entrepreneur: provide space, the so-called 'Maker-space', where initiatives and activities can be organised that encourage young people to take a look at various technologies and to supply the digital economy with specialists.

Best practices in the Spanish context

Infopirina[29]

All digital week is an annual event in Spain. In their contribution to this event AUPEX have focused on media literacy drawing attention to hoaxes, dis- and misinformation rapidly spreading during COVID-19 crisis, especially due to the lack of critical thinking. In February 2019, AUPEX launched www.infopirina.org, "a natural remedy against the virus of disinformation, based on the natural principles of critical thinking and media literacy".

The tool was widely used during the All Digital Week in online assistance and support video calls with users, providing them with resources, tips, and tools to identify disinformation and better understand the importance of media literacy. During the All Digital Week, AUPEX helped young people, adults with a low level of digital skills and other vulnerable groups improve their digital skills, as one of the priorities in this campaign, and also as part of the strategic priorities of the organisation.

Best practices in the Greek context

The 'Check-it' platform[30]

Some Greek and Cypriot researchers recently presented a solution against misinformation. They mention that artificial intelligence is the main key for the solution towards to fake news. The research proposes the use of the Check-it platform, "a system that combines a variety of signals into a pipeline for fake news identification…. using signals from domain flag-lists, online social networks, etc.". *Check-it* is a web-browser plugin, and its main function is to detect fake news efficiently and timely.

Best practices in the Swedish context

Media literacy and safe use of new media – National Swedish Strategy[31]

The Swedish National Agency for Education was commissioned by the Government in 2015 to propose two IT strategies, one for preschool and compulsory education and one for upper secondary education. In 2016, the agency completed the assignment and reported to the Government.

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[29] Infopirina (2019). Aupex. Available at: https://www.infopirina.org (Accessed: 29 March 2022)

[30] D. Paschalides et al., "Check-It: A plugin for Detecting and Reducing the Spread of Fake News and Misinformation on the Web," 2019 IEEE/WIC/ACM International Conference on Web Intelligence (WI), 2019, pp. 298-302.

[31] EACEA National Policies Platform: YouthWiki (2022) *Sweden – Media literacy and safe use of new media.* European Commission. Available at: https://national-policies.eacea.ec.europa.eu/youthwiki/chapters/sweden/68-media-literacy-and-safe-use-of-new-media (Accessed: 27 March 2022)

As stated in the corresponding section of the European Commission website *(Ibid)* "The strategy includes the following vision for 2022:

- All students develop adequate digital skills.
- The school system is characterized by the potential of digitalisation, so that digital tools and resources contribute to improved results and efficiency.

In order for the vision to be realized, the following needs to take place, according to the strategy:

- The governance documents for upper secondary school need to clarify the task of providing students with adequate digital skills.
- Headmasters need to have adequate ability to strategically lead digital development work.
- Staff working with students in upper secondary school need to have the ability to choose and use appropriate digital tools in their work.
- Staff working with students in upper secondary school need to have access to digital tools and teaching resources for work in and outside school.
- Students need to have access to digital tools and teaching resources for work in and outside school.
- There has to be sufficient infrastructure as well as technical and educational support at the school units.
- There has to be a wide range of digital teaching materials that make efficient use of digital techniques' capabilities, and in addition, other digital learning resources need to be widely used."

At the same time, the strategy distinguishes between formal education and non-formal plus informal education.

In regards to non-formal education on media literacy and online safety, in 2017, the Swedish Government decided on the following adjustments in curricula and syllabuses:

- To introduce programming as a distinct element in various subjects in compulsory education, such as in mathematics and technology
- To strengthen the abilities of students to critically evaluate sources of information
- To strengthen the students' problem-solving skills and their ability to translate ideas into action in a creative way with the use of digital technology
- To encourage students to work with digital tools, media and texts
- To promote the use and understanding of digital systems and services among the students
- To develop an understanding of the impact of digitalisation on the individuals and society among the students.

The mentioned adjustments apply from July 2018. The Swedish Media Council (Medierådet) and the National Agency for Education (Skolverket) are the main government actors responsible for empowering young people as conscious media users, protecting them from harmful media influences and promoting the use of digital media itself.

In regards to non-formal and informal education on media literacy and online safety, there is the Swedish Media Council (Statens medieråd), a government agency responsible for collecting, interpreting and disseminating research on children's and young people's use of media. The Statens medieråd also generates information and teaching materials on Media and Information Literacy (MIL) for schools and libraries, and it has been responsible for the Swedish part of the EU Commission's project Safer Internet.

Within this project, the learning tool MIL for me was created. This tool is an online training course on media and information literacy that aims to strengthen youth's competences to cope with anti-democratic messages in social media in particular and the Internet in general, including the enhancement of critical thinking, evaluation and fact-checking among youngsters. It can be found in the council's website or in Betterinternetforkids.eu. For developing MIL for me, the Safer Internet Centre Sweden (SIC SE) worked with the MIL concept based on UNESCO's framework, adding some minor national adaptations to the Swedish context.

In fact, MIL for me won the prize for the best educational tool in MIL for children and young people of the European network Insafe.

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REFLECTION ON NEEDED COMPETENCES/SKILLS FOR YOUNG PEOPLE

6) Reflection on needed competences/skills for young people

The dangers, threats and risks of misinformation, disinformation and fake news for youth in general and in the health and wellbeing contexts in particular have already been identified through desk research, interviews and surveys' responses and exposed in the previous sections of this report. It is apparent that there is a need for overcoming these new challenges brought by the digital era and finding effective solutions that allow young people to maximize the benefits of using digital tools and finding information online while minimizing the inherent risks.

There are several options that could act as solutions to the explored issues. One could be to demand and encourage individuals, organisations and corporations with high follower rates in social media to share high-quality, fact-checked information from trustable and official sources, clearly stating from where the information comes. In this way, the millions of followers they have could potentially perceive this as an example to follow, becoming more aware of the importance of sharing only truthful information and receiving a bigger amount of fact-checked content which could replace misinformation. Another option could be to claim governmental authorities and institutions in power to activate mechanisms for boosting e-safety as well as developing tools and programs for increasing e-health education and MIL education among youth and the population. From the perspective of the corporate level, it would be interesting to demand a raise of the security measures of the companies to reduce unwanted online security risks.

Nevertheless, each person also needs to take responsibility for her/his own actions, being aware of what she is reading for her own wellbeing, but especially knowing what she is disseminating and sharing further with her networks, as this can have the power of influencing others and the consequences can be particularly damaging when it comes to health and wellbeing. In order to do that, education on digital skills and media information literacy is required. From the inspiration on one article[32] that takes CSTA (Computer Standard Teachers Association)[33] and ISTE (Society for Technology in Education)[34] as a reference, we believe that it is important that youngsters and individuals become aware, learn and develop the following digital skills and abilities in order to boost digital readiness:

1. **Operation & application** of technology devices and digital tools, being able to select the appropriate tools for each given task and knowing how to manage them. For instance, it would be interesting to train young people to use other digital sources that are different from social media (the preferred one for youngsters), as youth are missing a whole area of views and expert analysis with which to inform and base their knowledge and understanding upon by restricting their time on the screens to social media mainly. There are solutions such as creating direct links from a device's home-screen or using an app to curate news content which could be explored here. In addition, there is also a need for learning to use the advanced search engine tools for enhancing online research results.

[32] Equip Team (2020) *The Comprehensive List of Digital Skills Students Need*. Available at: https://equip.learning.com/digital-skills-list (Accessed: 20 March 2022)
[33] Seehorn, D. et. Al. (2017) *Computer Science Teachers Association*. Available at: https://drive.google.com/file/d/1-dPTAI1yk2HYPKUWZ6DqaM6aVUDa9iby/view (Accessed: 27 March 2022)
[34] Society for Technology in Education (2022). *ISTE*. Available at: https://www.iste.org/ (Accessed: 27 March 2022)

2. **Ensuring e-security** and protecting one's privacy (avoiding viruses, malwares, spam, phishing, etc.). It can also be useful for youth to learn about technical and legal mechanisms they can apply when they find themselves in online unsecure situations.
3. **Problem solving & critical thinking** to be applied in digital environments for being capable of discerning misinformation from trustful sources, verifying sources, fact-checking, or solving other problems that might arise in the online world (being influenced/misguided by the action of algorithms in social media, etc.). Besides, the ability to judge whether or not someone is qualified or experienced enough to provide information we seek is an important competence when navigating media.
4. **Researching information** (in connection with critical thinking) from trustable and official sources, analysing it, being capable of narrowing it down to the important points and synthesizing it. There is also a need to show youngsters and other people how not to let the search engines mislead us, and how to find correct sources that are underrepresented on the first pages of the search engines. The Internet contains a huge amount of valuable data but it's sometimes lost in a larger amount of spam, scams, and business and political promotional activities.
5. **Digital citizenship** for developing an ethical and legal behaviour when participating in digital environments, understanding concepts such as copyright, plagiarism, etc.
6. **Online communication & collaboration** to develop learning networks, to be able to communicate truthful information effectively in different online formats and collaborate with others using digital mediums. In terms of online communication, it is also crucial to learn how to be empathic and perform peaceful, non-violent communication online, in order to bolster respectful behaviours among different cultures, points of view and opinions. We need to develop the ability to interact with others and build healthy networks while being able to critically evaluate the impact of our interpersonal interactions with others as well as the impact that the content we share might have.
7. Ellen J. Helpser et.al.[35] add to the list skills such as **content creation & production** for possessing the ability to create quality digital content and understand how it is produced, published and disseminated, being aware of the impact we can generate on others.
8. Additionally, in relation to digital citizenship and taking into account the topics of health and wellbeing approached by this report, we believe it is crucial to include **e-safety** as an essential digital skill. Youngsters have the need for developing e-safety behaviours that allow them to avoid both suffering or provoking situations related to social isolation, depression, digital addiction, cyberbullying or online violence, among others. E-safety is extremely important to guarantee that young people have a positive experience in online environments, preserve their mental health, raise awareness of the risks they can face when being online and the impact their words and actions may have on others.

The mentioned skills are tightly linked to the DigComp 2.2. framework[36]. The DigComp framework offers a scheme that can be used to plan and design MIL and e-health education

[35] Helsper, E. J. et. Al. (2020) *The youth Digital Skills Indicator: Report on the conceptualisation and development of the ySKILLS digital skills measure*. (p. 15). Available at: https://research.utwente.nl/en/publications/the-youth-digital-skills-indicator-report-on-the-conceptualisatio (Accessed: 27 March 2022)

[36] European Commission – EU Science Hub (2022) *DigComp Framework*. Available at: https://joint-research-centre.ec.europa.eu/digcomp_en (Accessed: 29 March 2022)

and training, as it allows individuals to identify their digital competence levels and encourages them to work on the areas which might need improvement. Therefore, the DigComp opens doors to explore and increase MIL and e-health literacy education and recognition, which can be utilized by a diverse range of organisations and institutions for supporting young people in minimizing their risk exposure in the digital world while boosting their digital skills. The competence areas that the framework defines are:

- Information and Data Literacy (closely related to the above-mentioned points 1, 3 and 4),
- Communication and Collaboration (linked to 5 and 6),
- Digital Content Creation (related to 7 and 5),
- Safety (related to 2, 5, 6 and 8) and
- Problem Solving (related to 3).

As the framework describes, these skills can be obtained at different proficiency levels, from foundation to intermediate, advanced or highly advanced depending on the individual's cognitive challenge, the complexity of the tasks he/she can handle and her/his autonomy in completing the task. It may be advisable to try identifying the level of each individual for each of the skills before attempting to develop them further, as this will raise awareness on the learner's starting point and, subsequently, it will foster the building of conscious connections between the already existing ones and the new incoming knowledge.

Therefore, cultivating **media & information literacy (MIL)** among youth and society is crucial. We need to increase the use of evidence-based educational programs to fight misinformation, while educating youngsters and the wider public on common strategies used by those who spread disinformation online so that they can recognise how misinformation is created, with which purposes and how to recognise, avoid and fight it. As Anducas & Nadesan (2021)[37] conclude "policies should be aimed at training in digital skills, rather than restricting or prohibiting access". In this sense, also libraries could play a key role to support users in their search for information and offer services to increase reading skills (Lopez-Borrull et al, 2018)[38].

When it comes to health and wellbeing, **e-health literacy** becomes essential too. The tendency for checking symptoms on the Internet is raising. Thus, youngsters have to acquire knowledge about truthful and official sources of information they can count on when they need health information. Simultaneously, it is important to raise awareness on the need to directly seek the professional advice of an expert (i.e., doctor, pharmacy, etc.) in case of illness or any kind of discomfort, which will be much more trustful and personalised to the person's characteristics than any Google search. For these purposes, we identify the DigComp framework as an opportunity to bolster MIL and e-health literacy education for further developing the digital

[37] Anducas, M. & Nadesan, N (2021) Smiles Baseline Study: Country Report Spain, Fundación Platoniq, Poynter (2022) Spain. Available at: https://www.poynter.org/mediawise/international/spain/#, (Accessed: 29 March 2022)

[38] López-Borrull, A.; Ollé, C. (2020). "Curación de contenidos científicos en tiempos defake science y Covid-19: una aproximación entre las ciencias de la información y lacomunicación". En: Comunicación y diversidad. Selección de comunicaciones del VIICongreso Internacional de la Asociación Española de Investigación de la Comunicación(AE-IC). Valencia, España, October 28-30, pp. 281-289. https://doi.org/10.3145/AE-IC-epi.2020.e16

competences and the knowledge of youth, promoting their safety and wellbeing in digital environments.

In fact, research showed that media literacy activities significantly promote civic participation and increase regular newspaper readership among youngsters. Indeed, it is extremely needed to incorporate media education as part of the schools' curricula[39], although it could also be included in universities, or more broadly in public venues such as libraries to offer free, accessible education to everyone. Following this line, it would be interesting to establish quality indicators to assess the progress of youngsters and society in terms of media literacy and e-health literacy, while allowing learners to give feedback on the education they receive for being able to improve it and eventually create high quality education with the collaboration of all the involved individuals (i.e., educators, teachers, experts, learners, etc.).

Additionally, evidence demonstrated that critical thinking is a skill that can be taught, and new resources to teach e-health and media literacy are becoming increasingly available[40]. Another research has shown that for both 16–17-year-olds and 18–24-year-olds a fairly simple MIL training course can improve their ability to make well-calibrated judgements about information[41]. If the reader would like to learn more about how to take action for developing MIL and e-health education, see Annex 2.

Still, there are many internet users who **are not motivated** to learn about MIL and e-health education. Nonetheless, attitude and motivation are highly needed to ensure successful learning. For that matter, proposals as the one of Chris M. Worsnop[42] can be very beneficial to boost people's interest for learning: "*instead of focusing on the fast-shifting content and knowledge of media, we could use media as a way of engaging learners in working on outcomes that are vital*" such as effective communication, investigation, understanding the world as a set of related systems, collaboration, responsible citizenship, career education, aesthetics, etc. This is something that the DigComp 2.2. framework can promote through the identification of digital competences and the development of statements for different proficiency levels for each of the competences, encouraging individuals to foster the improvement of their digital skills.

Lastly, it is important to remark that not only the motivation of the learners needs to be boosted, but also the one of the stakeholders who can play a role in providing MIL and e-health education to young people (i.e., schools, teachers, trainers, youth workers, local/regional/national/international authorities, etc.). For instance, one of the interviewed stakeholders, who is a media industry expert in Spain, believes that schools have the responsibility to teach young people how to use social media and about how to recognise false

[39] Kubey, R. (2003) *How Media Education Promotes Critical Thinking, Democracy, Health, and Aesthetic Appreciation*. (p. 4). Available at: http://www.centerformedialiteracy.net/sites/default/files/547_CICML-Kubey.pdf (Accessed: 29 March 2022)

[40] Swire-Thompson, B. and Lazer, D. (2020) *Annual Review of Public Health - Public Helath and Online Misinformation: Challenges and Recommendations*. Vol. 41:433-451. Available at: https://www.annualreviews.org/doi/10.1146/annurev-publhealth-040119-094127 (Accessed: 13 March 2022)

[41] Ecker, U. et. Al. (2022) *The psychological drivers of misinformation belief and its resistance to correction.* Available at: https://www.nature.com/articles/s44159-021-00006-y (Accessed: 18 March 2022)

[42] Worsnop, C. (2004) Media Literacy Through Critical Thinking. (p. 11). Available at: https://mediaeducation.ucoz.ru/_ld/10/1092_Worsnop_2004.pdf (Accessed: 29 March 2022)

news, but she sees little happening due to government inaction on school curricula and the lack of interest from school managers and teachers. Hence, the activation of the school system in this regard is very necessary, especially in countries such as Spain.

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NEW DIGCOMP COMPETENCE STATEMENTS

7) New DigComp Competence Statements

In the light of the findings provided by the present report, new statements have been developed for 13 of the 20 competences described in the 5 competence areas of the DigComp 2.2 framework, with the goal of bolstering the health and wellbeing aspect of it. These 13 competences have been selected taking into account their relevance in relation to health and wellbeing information and the reflections exposed in the previous section of this report.

Next, all the DigComp 2.2. competences are exposed. The reader can find more information about the DigComp 2.2. framework and its competences by following this link or by consulting the References section. The 13 competences approached by the current report are highlighted in bold.

COMPETENCE AREA: 1. Information and data literacy
1.1 Browsing, searching and filtering data, information and digital content
1.2 Evaluating data, information and digital content
1.3 Managing data, information and digital content
COMPETENCE AREA: 2. Communication and collaboration
2.1 Interacting through digital technologies
2.2 Sharing through digital technologies
2.3 Engaging citizenship through digital technologies
2.4 Collaborating through digital technologies
2.5 Netiquette
2.6 Managing digital identity
COMPETENCE AREA: 3. Digital content creation
3.1 Developing digital content
3.2 Integrating and re-elaborating digital content
3.3 Copyright and licences
3.4 Programming
COMPETENCE AREA: 4. Safety
4.1 Protecting devices
4.2 Protecting personal data and privacy
4.3 Protecting health and well-being
COMPETENCE AREA: 5. Problem solving
5.1 Solving technical problems
5.2 Identifying needs and technological responses
5.3 Creatively using digital technology
5.4 Identifying digital competence gaps

The following tables present each of the highlighted competences and the developed statements in regards to health and wellbeing in the digital context. First, the competence area (Dimension 1 of the DigComp 2.2 framework) and the specific competence (Dimension 2) are indicated. Then, the statements have been developed for the foundation and intermediate proficiency levels (Dimension 3), following the same format as DigComp 2.2. Last but not least, for each statement, there is a reference to Dimension 4 of the DigComp 2.2 framework that indicates if the statement may be an example for knowledge, skills and/or attitudes.

DIMENSION 1 · **COMPETENCE AREA**
1. INFORMATION AND DATA LITERACY

DIMENSION 2 · **COMPETENCE**
1.1. BROWSING, SEARCHING AND FILTERING DATA, INFORMATION AND DIGITAL CONTENT

1

2

DIMENSION 3 · **PROFICIENCY LEVEL**

			knowledge (K), skill (S), or attitude (A)?
F N DATIO N 3	At a basic level and with guidance, I can:	• **identify** the general possibilities of search engines (e.g., Google search) to avoid a particular source or word result that could harm my research regarding health and wellbeing.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **find** my search history records that could expose personal information regarding my health and wellbeing.	S, K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **describe** the possibilities of search engines with advanced options to improve my search results to better sources of information regarding health and wellbeing.	S, K
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **use** search engines with advanced options (language, region, specific source domain, file type, usage rights, searching exact words or avoiding words etc) to improve my search results to better sources of information regarding health and wellbeing.	S, A, K

DIMENSION 1 · **COMPETENCE AREA**
1. INFORMATION AND DATA LITERACY

DIMENSION 2 · **COMPETENCE**
1.2. EVALUATING DATA, INFORMATION AND DIGITAL CONTENT

1

DIMENSION 3 · **PROFICIENCY LEVEL**

			knowledge (K), skill (S), or attitude (A)?
F N DATIO N 4	At a basic level and with guidance, I can:	• **investigate** the sources of health and wellbeing information shared by others.	K, S
	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **fact-check basic** health information I read on websites.	S
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **keep a list** of trustworthy sites known to share truthful information about healthcare.	S, A
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **collate** a set of useful resources and tools to help me to evaluate the trustworthiness of the media I consume that influences my perception of health and wellbeing.	S, A

DIMENSION 1 · **COMPETENCE AREA**
2. COOMUNICATION AND COLLABORATION

DIMENSION 2 · **COMPETENCE**
2.2. SHARING THROUGH DIGITAL TECHNOLOGIES

1

DIME 2 3 ON 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
DATIO N 4	At a basic level and with guidance, I can:	• **recognise** appropriate technologies to find and share veridic and fact-checked health information.	K
	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **recognise** appropriate technologies to find and share veridic and fact-checked health information.	K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **select** and **utilize** appropriate technologies to find and share verified and fact-checked health information, being aware of how this can impact the people I share the information with.	S
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **explain** how to find and share verified and fact-checked health information through digital technologies, being aware of how this can impact the people I share the information with.	S, A

DIMENSION 1 · **COMPETENCE AREA**
2. COOMUNICATION AND COLLABORATION

DIMENSION 2 · **COMPETENCE**
2.3. ENGAGING CITIZENSHIP WITH DIGITAL TECHNOLOGIES

1

2

DIMENSION 3 · **PROFICIENCY LEVEL**

3

			knowledge (K), skill (S), or attitude (A)?
F N DA IO N	At a basic level and with guidance, I can:	• **identify** digital services that offer health and wellbeing information to preserve my own and others' health.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **recognise simple** technologies to empower myself to participate in health and wellbeing discussions and contexts to preserve my own and others' health.	K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **select well-defined and routine** digital services that allow me to engage in health and wellbeing discussions and contexts in a safe manner.	S
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **discuss** digital services that allow me to engage in health and wellbeing discussions and contexts in a safe manner.	S, A

DIMENSION 1 · **COMPETENCE AREA**
2. COOMUNICATION AND COLLABORATION

DIMENSION 2 · **COMPETENCE**
2.5. NETIQUETTE

1

DIME 3 ON 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
F N DATIO N 4	At a basic level and with guidance, I can:	• **recognise** opinions and perspectives that differ from mine in social media and other digital environments.	K
	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **recognise** opinions and perspectives that differ from mine in social media and other digital environments.	K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **interpret empathetically** those opinions and perspectives that differ from mine in social media and other digital environments, adopting healthy attitudes towards them.	S, A
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **discuss respectfully** with those who have opinions and perspectives that differ from mine in social media and other digital environments, adopting healthy attitudes towards them.	S, A

DIMENSION 1 · **COMPETENCE AREA**
2. COOMUNICATION AND COLLABORATION

DIMENSION 2 · **COMPETENCE**
2.6. MANAGING DIGITAL IDENTITY

1

2
DIMENSION 3 · **PROFICIENCY LEVEL**

3

			knowledge (K), skill (S), or attitude (A)?
F N DATIO N	At a basic level and with guidance, I can:	• **recognise and describe simple** types of health information produced by others.	K, S
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **describe** ways in which other online users use content to build and protect their digital persona and health information.	K, S
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **research** an online persona to make an informed judgement about the trustworthiness of the health care information they most frequently share and produce.	S, A
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **choose** networks and online spaces which have a positive effect on my health and wellbeing and make trustworthy connections within those spaces.	S, A

DIMENSION 1 · **COMPETENCE AREA**
3. DIGITAL CONTENT CREATION

DIMENSION 2 · **COMPETENCE**
3.2. INTEGRATING AND RE-ELABORATING DIGITAL CONTENT

1

DIMENSION 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
FOUNDATION	At a basic level and with guidance, I can:	• **select** factual, trustworthy information with which to create new health and wellbeing content.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **select** ways to modify and present content which retains the integrity of the health and wellbeing information.	K, S
INTERMEDIATE	On my own and solving straightforward problems, I can:	• **recognise and explain** ways in which others may modify and present health-related content.	S
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **explain** how others might manipulate health content to convey a particular message.	S, A

DIMENSION 1 · **COMPETENCE AREA**
3. DIGITAL CONTENT CREATION

DIMENSION 2 · **COMPETENCE**
3.3. COPYRIGHT AND LICENCES

1

2
DIMENSION 3 · **PROFICIENCY LEVEL**

			knowledge (K), skill (S), or attitude (A)?
F N DA N 3	At a basic level and with guidance, I can:	• **understand** the importance of ethics, human privacy and dignity in the digital contexts.	A
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **identify simple** rules of copyright and licences (i.e., GDPR, Creative Commons) that apply to personal, health and wellbeing data, digital information and content.	K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **describe well-defined and routine** rules of copyright and licences (i.e., GDPR, Creative Commons) that apply to personal, health and wellbeing data, digital information and content.	S, K
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **discuss** rules of copyright and licences (i.e., GDPR, Creative Commons) that apply to personal, health and wellbeing data, digital information and content.	K, A

DIMENSION 1 · **COMPETENCE AREA**
4. SAFETY

DIMENSION 2 · **COMPETENCE**
4.2. PROTECTING PERSONAL DATA AND PRIVACY

1

DIMENSION 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
FOUNDATION	At a basic level and with guidance, I can:	• **recognize** the existence of hacking protection software.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **download and install** anti hack software to protect my personal health and wellbeing information.	K, S
INTERMEDIATE	On my own and solving straightforward problems, I can:	• **explain** how my data can be protected and supported in case of illegal practices and from troubling scenarios online.	S, K
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **edit or delete** any (harmful) content that a hacker creates on my account that could jeopardize information related to my personal health and wellbeing.	S, A

DIMENSION 1 · **COMPETENCE AREA**
4. SAFETY

DIMENSION 2 · **COMPETENCE**
4.3. PROTECTING HEALTH AND WELL-BEING

1

DIMENSION 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
FOUNDATION	At a basic level and with guidance, I can:	• **recognise** the time I spend on social media daily.	S
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **approach** the news and anything I read online related to health and wellbeing with critical thinking.	S
INTERMEDIATE	On my own and solving straightforward problems, I can:	• **detect** who may be holding or profiting from the information I share regarding my health and wellbeing.	K
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **make informed and conscious choices,** about the safety and trustworthiness of the online places I access while **referring to multiple** health and wellbeing sources to gather new insights into a certain topic.	S, A, K

DIMENSION 1 · **COMPETENCE AREA**
5. PROBLEM SOLVING

DIMENSION 2 · **COMPETENCE**
5.2. IDENTIFYING NEEDS AND TECHNOLOGICAL RESPONSES

1

2
DIMENSION 3 · **PROFICIENCY LEVEL**

			knowledge (K), skill (S), or attitude (A)?
F 3 DATIO N	At a basic level and with guidance, I can:	• **identify** platforms, tools and digital environments which are not suited to my needs when searching for health and wellbeing information.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **remove** myself from platforms, tools and digital environments which are not suited to my health and wellbeing needs.	K, S
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **prevent** content which is not suited to or is harmful to my health care needs from being a part of my digital environment.	S, A
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **flag** content, tools or environments which may be harmful to my health and wellbeing (For example by interacting with a platform moderator).	S, A

DIMENSION 1 · **COMPETENCE AREA**
5. PROBLEM SOLVING

DIMENSION 2 · **COMPETENCE**
5.3. CREATIVELY USING DIGITAL TECHNOLOGY

2

DIMENSION 3 · **PROFICIENCY LEVEL**			**knowledge (K), skill (S), or attitude (A)?**
FOUNDATION	At a basic level and with guidance, I can:	• **acknowledge** the existence of basic digital mental health apps and tools created for tracking changes in mood or behaviour and learning mental health issues coping strategies.	K
3	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **identify and use** essential assistive technologies that can support mental health through apps or tools (e.g., guided meditation apps, mood tracking apps, or digital cognitive behavioural therapy tools) and **identify and use** trustworthy online communities or forums to connect with others who share similar mental health or wellbeing challenges or goals.	S
4			
INTERMEDIATE	On my own and solving straightforward problems, I can:	• **share** knowledge of at least one unusual digital tool with a reliable and credible source that can help to conduct primary research and gather information on specific mental health or wellness issues.	S
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **repack and share** in creative ways (such as making a video, poster, etc.) trustworthy information on mental health or wellbeing issues using advanced digital tools and digital strategies.	K, A

DIMENSION 1 · **COMPETENCE AREA**
5. PROBLEM SOLVING

DIMENSION 2 · **COMPETENCE**
5.4. IDENTIFYING DIGITAL COMPETENCE GAPS

1

2

DIMENSION 3 · **PROFICIENCY LEVEL**

3

			knowledge (K), skill (S), or attitude (A)?
F… N DATIO N	At a basic level and with guidance, I can:	• **recognise** that there may be gaps in my own digital literacy competence with respect to accessing and understanding health and wellbeing information.	K
4	At a basic level and with autonomy and appropriate guidance where needed, I can:	• **identify** ways to find support for my own digital literacy development.	S, K
INTER MEDI ATE	On my own and solving straightforward problems, I can:	• **explain** how producers and sharers of health and wellbeing information have differing levels of digital literacy competence.	S, A
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• **Discuss** how my own and others digital literacy competence could be improved.	S, A

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CONCLUSION AND DISCUSSION

After careful analysis, it is possible to confirm that young people are exposed to different risks associated to misinformation, disinformation and fake news, especially when it comes to topics related to health and wellbeing. At the same time, their own mental and physical health can be affected by misinformation, not only because they can find wrong information and therefore follow inaccurate and/or prejudicial health advice, but also because being exposed to the online environments and their risks can cause feelings such as stress, depression and even encourage negative behaviours and addictions.

It becomes apparent that the main hazard for youth is the utilization of the digital tools, especially social media, without being fully aware of the risks they are exposed to nor prepared for solving the digital challenges they may encounter. For this reason, media and information literacy, and specifically e-health literacy education are extremely needed so that youngsters can use the Internet for the enhancement of their competences, knowledge and wellbeing while minimizing the risks. Increasing the motivation of the youngsters to learn about the mentioned topics is as necessary.

Furthermore, we cannot forget that it is also crucial to increase the interest of both youngsters and those stakeholders working with youth (from local authorities to teachers, youth workers, etc.) to bring their efforts together into taking action for fighting against the challenges of the digital era.

In this context, the DigComp 2.2 framework brings an opportunity to give visibility to the mentioned issues and encourages young people and other individuals to assess their digital competences for raising awareness on their current development levels and detecting the possible areas they can work on for fostering their improvement. Thereupon, different suggestions for the creation of new competence statements linked to the DigComp 2.2 framework that are related to health and wellbeing information and suited to young people have been proposed. These aim to assist youth in assessing their level of digital competence in the context of health and wellbeing. After doing this exercise directed to youth, it is believed that similar procedures could be applied to other target groups with akin purposes, as it is not only youngsters but the whole population who are exposed to the risks that digital environments disguise.

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9. Media for Inclusion Manual (2015) *SALTO-YOUTH*. Available at: https://www.salto-youth.net/tools/toolbox/tool/media-for-inclusion.1773/ (Accessed: 21 March 2022)
10. Czech the Facts: Booklet for youth workers in media literacy (2016) *SALTO-YOUTH*. Available at: https://www.salto-youth.net/tools/toolbox/tool/czech-the-facts-booklet-for-youth-workers-in-media-literacy.1902/ (Accessed: 21 March 2022)
11. Booklet for youth workers in media literacy: Czech the Facts Out 2 (2017) *SALTO – YOUTH*. Available at: https://www.salto-youth.net/tools/toolbox/tool/booklet-for-youth-workers-in-media-literacy-czech-the-facts-out-2.2125/ (Accessed: 21 March 2022)
12. Media4inclusion Booklet (2019) *SALTO-YOUTH*. Available at: https://www.salto-youth.net/tools/toolbox/tool/media4inclusion-booklet.2605/ (Accessed: 21 March 2022)
13. Keen E. and Georgescu M. (2020) Council of Europe. *Bookmarks. A manual for combating hate speech online through human rights education*. Available at: https://rm.coe.int/bookmarksen2020-web2/16809e5789 (p. 195-196) (Accessed: 22 March 2022)

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ANNEX 1 – OTHER BEST PRACTICE EXAMPLES

General best practices

1. **Schools & their curricula:**

The first solution refers to the educational system. Multi-perspective education and critical thinking should be the most crucial topics and skills taught in young people and should constitute "the key dimension of school curricula". [43]

2. **Libraries**

A recent study proposes that the future and the main solution to defeat mis - and disinformation is the existence of libraries, either national, regional, or local. It is a chance to develop socially the benefits of reading information for free (or with a typical annual fee) and receive multiple aspects from various aspects. Additionally, the experts and the scientists of information should promote the fight against dis-misinformation through digital literacy. This means that their role will be leading and advisory in terms of showcasing the correct and appropriate way to stay informed by official and multiple resources. [44]

Best practices in the Luxembourgish context

1. **BEE SECURE**[45]

The 'BEE SECURE for schools' training programmes aim to encourage positive, responsible and safe Internet usage among students. Overall, the training communicates three fundamental messages:

- The Internet is not magic – it is a technical infrastructure
- The Internet never forgets
- You are the only one who can protect yourself.

In the frames of BEE SECURE program, there were remarkable initiatives - 2 hotlines.

a. BEE SECURE Stopline. Here, citizens can anonymously report suspicious content, such as child sexual abuse material, racism, revisionism, discrimination and/or terrorism. In 2020, the BEE SECURE Stopline registered a total of 4022 links containing child sexual abuse material. 2410 of these links were classified as illegal by the BEE SECURE Stopline. The Stopline received a total of 292 links containing racist, revisionist and discriminatory content. 240 of these links were classified as illegal by the BEE SECURE Stopline team and a total of 22 links contained terrorist content, of which 15 were classified as illegal. The numbers show an increase in

[43] Lakasas, A. (2021, July 28). *Report shows fake news gaining foothold in Greece*. kathimerini.gr. Available at: https://www.ekathimerini.com/news/1165273/report-shows-fake-news-gaining-foothold-in-greece/ (Accessed: 11 April 2022)

[44] Skarpa, P. E., & Garoufallou, E. (2022). The role of libraries in the fake news era: a survey of information scientists and library science students in Greece. *Online Information Review*, *ahead-of*(ahead-of-print). Available at: https://doi.org/10.1108/oir-06-2021-0321 (Accessed: 11 April 2022)

[45] BEE SECURE (2020). Le Gouvernement de Grand-Duché de Luxembourg. Available at: https://www.bee-secure.lu/de/ (Accessed: 21 March 2022)

reports in the domain of racism, revisionism and discrimination. The report highlights factors that could explain this increase. It refers to better knowledge about the BEE SECURE Stopline, the pandemic, but also to the fact that citizens are doing their part, taking responsibility and reporting illegal content they encounter.

b. BEE SECURE Helpline. It mainly targets children, youngsters and their parents and offers information, advice and help on ICT-related topics. Callers can remain anonymous while talking to pedagogues and psychologists who are also experts in the field of information security. In 2020, the Helpline received calls on the following subjects: e-crime, data protection, technical settings, sextortion and cyberbullying. The Helpline received a total of 464 calls (514 in 2019; 226 in 2014) and 351 online requests via the online form. The report highlights a significant number of people who called the BEE SECURE Helpline for help with respect to cyberbullying, an issue that continues to raise concerns. Another issue is sexting, which poses an increasing challenge not only for those who work with teenagers but also for the teens themselves, especially when situations get out of hand and could lead to sextortion situations.

As part of this overarching strategy the Bee Creative program was launched too, specifically focusing on improving the digital skills of young people in Luxembourg & building a digital culture, including via the introduction of makerspaces within schools.

2. Luxembourg Cyber Security Week[46]

European cybersecurity month was initiated in 2017 by 6 EU countries and Luxembourg is one of them. In 2020 the number of participating countries was already 19. In the frame of this, the Cybersecurity Luxembourg community organizes Cybersecurity Week Luxembourg which is a 10-day event regrouping security experts, businesses, innovators, investors and decision-makers from Luxembourg Cybersecurity ecosystem to discuss the latest trends, products and services. In 2020 there were around 30 events, mainly held online.

3. EDMO BELUX (Luxembourg and Belgium)[47]

EDMO BELUX is a hub on research, fact-checking and media literacy on online disinformation in Belgium and Luxembourg. Launched in October 2021 and funded by the European Commission, it gathers a network of more than 100 disinformation experts and operates in five languages (Dutch, French, English, German, Luxembourgish). The Vrije Universiteit Brussel (VUB) coordinates this project. Within the VUB, EDMO BELUX is a joint venture between the

[46] NATO Support and Procurement Agency, (2021) *Luxembourg cyber security week: four questions to NSPA chief information officer*. Available at: https://www.nspa.nato.int/news/2021/luxembourg-cyber-security-week. (Accessed 24 March 2022)

[47] EDMO BELUX PRESS RELEASE. (2022) Belgian and Luxembourgish platform fighting disinformation launches its first actions. Available at: https://chronicle.lu/category/marketing-communication/39630-belgo-luxembourg-anti-disinformation-platform-launches-fact-checking-website (Accessed 22 March 2022)

Centre for Digitalisation, Democracy and Innovation (CD2I)[48] at the Brussels School of Governance and the Centre for Studies on Media, Innovation and Technology (imec-SMIT)[49]. The project is a part of the European Digital Media Observatory (EDMO)[50], a network of hubs on digital media contributing to the fight against disinformation across Europe.

EDMO BELUX considers itself to have a major role to play in fighting disinformation in these territories through:

- a disinformation rapid response network: the platform will provide daily fact-checks, regular analysis and expertise to first responders of disinformation and citizens to better grasp the dangers of disinformation, tools to fight it and factual information;
- a knowledge hub with key resources to better understand disinformation and its impact;
- a strong network of journalists, academics and experts that bring a coherent and collective response to disinformation.

EDMO BELUX has also launched its social media channels, with its Twitter account (@EDMO_BeLux) providing daily resources on disinformation in Belgium and Luxembourg. On LinkedIn, EDMO BELUX will seek to engage with the numerous experts of both countries to bring a more collective response to disinformation.

Best practices in the Spanish context

1. **The EU SMILES project[51]**

The EU SMILES project, a media literacy project about helping young people learn how to combat fake news and disinformation has identified a large number of projects and initiatives in Spain around Digital Literacy[52]. All are available in Spanish.

1. **Be Critical[53]**

[48] Centre of Digitalisation, Democracy and Innovation (2021). Brussels School of Governance. Available at: https://brussels-school.be/research/digitalisation-democracy-and-innovation (Accessed: 21 March 2022)
[49] Studies in Media, Innovation and Technology (2021). Research group at imec & Vrije Universiteit Brussel. Available at: https://smit.vub.ac.be/ (Accessed: 21 March 2022)
[50] European Digital Media Observatory (EDMO) (2021). Available at: https://edmo.eu/2021/05/26/national-edmo-hubs-announced/ (Accessed: 21 March 2022)

[51] Smiles (2020). Erasmus Plus Project KA226. Available at: https://smiles.platoniq.net/ (Accessed: 29 March 2022)

[52] Anducas, M. & Nadesan, N (2021) Smiles Baseline Study: Country Report Spain, Fundación Platoniq, Poynter (2022) Spain. Available at: https://www.poynter.org/mediawise/international/spain/# (Accessed: 29 March 2022)

[53] EduCaixa. Available at: https://educaixa.org/es/programa-becritical-en-el-aula (Accessed: 29 March 2022)

Be Critical is an educational program for media competence and critical thinking offered by EduCaixa, and includes a pedagogical orientation guide for students in the first and second levels of compulsory secondary education (ESO).

2. **Learn to Check**[54]

Learn to Check is a media education project about disinformation and digital content verification set up in 2020. It is intended to underpin media education, and in particular to teach about digital verification.

They have several workshops aimed at youth, such as the one named “Quen no te la cuelen” (Don’t be taken in). This is a workshop for high school and vocational training students in which they combine a theoretical element, teaching the concepts, tools and processes of verification, with a practical part in which the youngsters become digital detectives, and are called on to overcome the verification challenges they set them.

3. **Vaccinate yourself against misinformation**[55]

The "Vaccinate yourself against misinformation" initiative is one of the few mapped interventions aimed at library staff. It is a series of webinars organised by BiblioMadSalud that deals with scientific publishing and health information resources.

4. **The Verificat Gen-Z project**[56]

The Verificat Gen-Z project has developed an initiative with an innovative format: they have created a nascent community of fact-checkers made up of high school students from a school in Barcelona. In the first phase, the students learn to detect and verify content and then build communication channels through YouTube, Instagram and TikTok where they can share their experience and verifications.

5. **Yo Doctor**[57]

This initiative by Maldita shares a toolbox with basic tools to be able to check fake news; as well as a compilation of comics against scientific hoaxes under the title "Yo, Doctor". They also created the book "You don't play with fake news", intended for young people and complementary to a manual for teachers covered in the Didactic Guides section.

6. **They don’t fool me**[58]

[54] Learn to Check. Available at: https://learntocheck.org/ (Accessed: 29 March 2022)

[55] BiblioMadSalud (2022). Wolters Kluwer. Available at: https://tools.ovid.com/events/bibliomadsalud/ (Accessed: 29 March 2022)

[56] Verificat (2022). Catalunya, Spain. Available at: https://www.verificat.cat/es

(Accessed: 29 March 2022)

[57] Yo Doctor (2018). Maldita. Available at: https://www.yodoctor.es/maldita/ (Accessed: 29 March 2022)

[58] EduCAC (2022). Consell Audiovisual de Catalunya. Available at: https://www.educac.cat/que-educac (Accessed: 29 March 2022)

The awareness campaign "They don't fool me" by CAC (Audiovisual Council of Catalonia) has the aim of awakening a critical spirit and promoting good habits in the face of new forms of audiovisual and technological consumption.

Although the campaign is aimed primarily at young people, its intention is to challenge the public with a message that empowers young people and adults in front of their screens

Best practices in the Greek context

1. **The 'Check-it' platform**[59]

Some Greek and Cypriot researchers recently presented a solution against misinformation. They mention that artificial intelligence is the main key for the solution towards to fake news. The research proposes the use of the Check-it platform, "a system that combines a variety of signals into a pipeline for fake news identification…. using signals from domain flag-lists, online social networks, etc.". *Check-it* is a web-browser plugin, and its main function is to detect fake news efficiently and timely.

Best practices in the Swedish context

1. **Safe Internet for All (SIFA)** [60]

It is essential for the school community to develop the right attitude towards online environments, the Internet and ICT. Many students and even some teachers are unaware of dangers, safety risks, security matters, health and ethics matters that come with the usage of digital tools. Hence, it is crucial that students receive e-safety education at school. Teachers also need further training to ensure they have the knowledge and confidence to deliver e-safety education and respond to any issues related to the use of digital tools/ICT.

The project Safe Internet for All (SIFA) focused on raising awareness among the school community about the dangers and risks of the digital world while informing, educating and preparing students and teachers to cope with these. Thus, through SIFA activities the project has raised awareness and delivered safety messages to students and their parents, helped schools develop an e-safety policy and support the development of functional and critical digital literacy and internet safety skills.

SIFA was a KA2 Strategic Partnership Erasmus Plus project integrated by schools. The participating schools were: the 2nd Lyceum of Kos (Greece – coordinator), Fridagymnasiet (Sweden), HAK Ybbs (Austria), Liceum Ogolnoksztalcace im. Piotra Skargi (Poland) and Os vidaregåande skule (Norway).

Teachers and students from these schools concentrated on aspects concerning the safe use of ICT and Internet. For that, 5 exchanges were held, each dealing with a different dimension of the subject:

1. Internet addictions (excessive use of social networks, gaming, etc.) - Austria
2. Matters concerning health (social isolation, depression, etc.) - Norway

[59] D. Paschalides et al., "Check-It: A plugin for Detecting and Reducing the Spread of Fake News and Misinformation on the Web," 2019 IEEE/WIC/ACM International Conference on Web Intelligence (WI), 2019, pp. 298-302.

[60] Erasmus+ Project Results Platform (2016). *Safe Internet for All – SIFA. Strategic Partnership for school education Erasmus Plus funded project*. Available at: https://erasmus-plus.ec.europa.eu/projects/eplus-project-details#project/2014-1-EL01-KA201-001294 (Accessed: 28 March 2022)

3. E-security (viruses, malware, spam, phishing, etc.) - Sweden
4. Matters of ethics (copyright, plagiarism, etc.) - Greece
5. E-safety (cyberbullying, grooming, etc.) - Poland

Before each exchange, pertinent preparation was conducted, including presentations, collection of data and state of the art, relevant research results, etc. During the exchanges, all groups from the 5 schools participated in activities relevant to the above specified topic. Lastly, the project contemplated follow up activities such as courses organized by students, presentations, dissemination and evaluation activities.

Therefore, SIFA helped students and teachers to:

- Recognize online risks
- Protect personal information and privacy
- Learn where/how to get help
- Demonstrate/advocate for ethical and legal behaviours
- Learn about plagiarism
- Respect copyright
- Make ethical and legal decisions

After the exchanges, students acted as teachers for their peers, raising student engagement and creating an authentic sense of urgency around their digital education. Students had plenty of opportunities to publicly share their own understanding and opinions, thus fostering authentic dialogue on their learning outcomes. These processes were enhanced through reflection.

The project also promoted the professional development of teachers concentrating on the strategic use of ICT. For this purpose, SIFA created a Learning Community of teachers, using web 2.0. Through this community, SIFA promoted the take-up of innovative practices in education, collaborative learning and critical thinking, open and flexible learning, virtual mobility and other innovative learning methods.

Additionally, 3 transnational teacher meetings were held that helped organize and manage the learning activities and evaluate the project.

Last but not least, another important product of SIFA was the research conducted in two ways: a general research with a pre-test and a post-test, and a smaller scale research before and after each project meeting. This served both as an intellectual output and as a tool for internal evaluation. SIFA was a successful project and has been considered a good practice example by the Erasmus+ Project Results Platform.

2. **No Alternative Facts**[61]

“No Alternative Facts” is a Strategic Partnership for Adult Education Erasmus Plus project that addressed the challenge of increasing media literacy to identify trust-worthy information in an adult education context through an innovative train-the-trainer format aiming to:

- Provide adult educators with useful skills and action-oriented methods on how to develop young people’s digital competence

- Enhance digital competence of young people aged between 15-25, especially with a low level of education and training

[61] No Alternative Facts. Strategic Partnerships for adult education Erasmus Plus funded project (2019). *Noalternativefacts.* Available at: http://www.noalternativefacts.net (Accessed: 18 March 2022)

In this way, the project intended to increase Critical Digital Literacy, especially critical thinking skills, of the mentioned groups.

The competences of adult educators were enhanced by the attitudes, knowledge and skills necessary to apply the innovative “No Alternative Facts” approach:

As action-oriented and productive methods are proven to be the most effective on developing critical thinking, the final beneficiaries, the young adults, will be encouraged to describe their own experience with fake news in the Internet in small videos and other multimedia formats and place it on an online gamification environment. After analysing their experiences, the young people themselves develop learning quizzes to test peers about their knowledge of "Fake News", Misinformation and Disinformation and how they can be detected.

Subsequently, the train-the-trainer offer for adult educators contained the following elements:

- Raising awareness and basic knowledge about "Fake News", Misinformation and Disinformation and about tools to detect them (watch websites, analytical methodologies, etc.)
- Insight into how "Fake News", Misinformation and Disinformation are created, can be spread and manipulated in social media.
- Introduction to game-based learning and quiz-based learning as methodologies for competence development and learner empowerment.
- Practical tools for media and quiz production.

The specific products developed by “No Alternative Facts” are:

- A Situational Analysis Report on how young people experience fake news
- A Train-the-Trainer Format for adult educators
- A Toolbox of Resources for Adult Educators
- An Online Gamification Environment

“No alternative facts” was put into practice in a Transnational Training Activity with 21 adult educators, who then tested the methodology with young people in their respective countries. A total of 432 youngsters were involved in the project and 127 adult educators were reached through multiplier events, which allowed them to learn about the project innovative approach as well.

6 organisations from different countries formed the partnership that developed and implemented this project: Apricot (UK) who was the coordinator, BUPNET (Germany), Catro (Bulgaria), die Berater (Austria), Folkuniversitetet (Sweden) and VIFIN (Denmark).

Best practices outside the EU

1. RTDNA (USA). Guidelines for preventing the spread of Mis-Disinformation [62]

The above mentioned refers to a training course on ethics and it is offered for journalists. The main topics of the training include:

- Investigate the source
- Examine the material
- Training and use of tools to spot fake material
- Reporting on the spread of misinformation

[62] *Guidelines for Preventing the Spread of Misinformation & Disinformation*. (2018). RTDNA. Retrieved April 11, 2022, from https://www.rtdna.org/content/guidelines_for_preventing_the_spread_of_misinformation_disinformation

2. Mount Allison University[63]

The Mount Allison University in Canada offers and suggests a wide range of solutions and proposals on how to fight fake news and misinformation.

- Lists of known fake news sites
- Tests and checklists on how to evaluate news stories and sources
- Fake news detectors and labeling
- Fact-checking websites
- A plethora of useful resources and tools

3. MediaWise[64]

MediaWise, a nonpartisan, nonprofit initiative of The Poynter Institute that has already reached 21 million people through online educational content and fact-checking training. MediaWise content has been viewed more than 53 million times.

In April 2022, they launched a free Spanish language 10-day WhatsApp course[65]. This was based around daily 5-minute lessons including simple, practical, techniques designed to improve digital engagement and awareness. By the end of the course, they say, learners will be able to identify and explain different types of misinformation, and practice techniques professional fact-checkers use.

[63] *Mount A Libraries: Fake News Guide: Tips and Resources*. (2022, February 7). Mount Alison University. Retrieved April 11, 2022, from https://libraryguides.mta.ca/fake_news

[64] MediaWise (2022). The Poynter Institute. Available at: https://www.poynter.org/mediawise/ (Accessed: 29 March 2022)

[65] Poynter (2022) Spain, https://www.poynter.org/mediawise/international/spain/#, accessed 29 March 2022

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ANNEX 2 – TAKING ACTION: FIGHT AGAINST HEALTH MISINFORMATION

Annex 2 – Taking action: Fight against health misinformation

This research concluded that MIL and e-health education are key for overcoming the challenges presented by health and wellbeing misinformation in the digital contexts. Next, some examples of different activities that aim to enhance MIL and e-health education are proposed. We hope that these can serve of inspiration for the reader to start taking action in the fight against health misinformation.

1. **Practical training**

One way of teaching e-health and media literacy is through practical training that allows participants to directly apply what they learn in a given situation. An example can be to practice analysing, interpreting, synthetising, evaluating and fact-checking media texts/videos related to health and wellbeing which require learners to apply critical thinking and identify connections with the media purposes and aimed target audiences. They can also try to pinpoint the possible repercussions that the content of the texts/videos can have on their physical and mental health. In this way, learners can question and discuss the reasons why the text might give or avoid certain information, especially if able to compare it with other sources of digital information. Doing this activity in pairs or small groups will foster collaboration and debate among the learners too.

2. **Questioning methods**

Another example for MIL training could focus on requesting learners to ask questions about the information displayed on a webpage or any other digital environment, such as:

- why is that kind of information there?
- who has created the content? Are they experts, or false experts? What might be the purpose of the displayed content?
- Is the information based on research or on personal opinion? What is the writing style or how is the information exposed?

Usually, training is most successful when it is delivered within the learners' context using examples that they are familiar with and encouraging conversation rather than telling them what to think, as we wish to boost critical thinking.

3. **Board games**

Other researchers have created an interactive board game inspired on the mechanisms by which a vaccine works. The board game proposes to expose learners to a weak form of misinformation that can neutralise persuasive but false arguments contradicting climate change, allowing for better identification of misinformation[66]. This kind of game dynamics could perhaps be implemented in health and wellbeing contexts too.

4. **Fight against health misinformation (for individuals and communities)**

[66] Ecker, U. et. Al. (2022) *The psychological drivers of misinformation belief and its resistance to correction.* Available at: https://www.nature.com/articles/s44159-021-00006-y (Accessed: 18 March 2022)

Subsequently, we would like to expose several actions that any individual or community can perform to fight health misinformation, which are, simultaneously, recommendations that were born during the Covid-19 pandemic[67]:

- Avoid sharing health misinformation and learn how to identify it as, sometimes, we share misinformation unintentionally, without realizing that the information is not accurate.
- Engage with friends and family on debating about health misinformation. If we perceive that someone in our circle might be consuming misinformation, we can challenge their beliefs through seeking understanding and empathic communication. Finally, we can search for the truthful version of that information together.
- Address health misinformation in your community, working with schools, community groups, and trusted leaders (e.g., educators, health care professionals, etc.) to develop local strategies against misinformation.

5. Youth Work

Finally, as stated in the research study Social Inclusion, Digitalisation and Young people done by the EU and the Council of Europe[68], youth work can also contribute to better support the health of youth through digital tools by:

- identifying the needs of young people and getting to know them better;
- predicting threats and prevention, for example detecting signs of stress and addressing young people's mental well-being;
- ensuring faster youth services – with the support of chatbots;
- using digital applications, such as the iWatch heart rate tracking, designed for people with conditions such as dyslexia or other problems related to stress/ anxiety, Down's syndrome, autism, and others;
- offering more personalised information and guidance for professional/social/ personal development based on the real needs of young people;
- supporting educational systems to become more tailored to the needs of young people, by using technologies that monitor the educational activity of young people and identify patterns for their preferred methods of learning.

[67] U.S. Public Health Service Surgeon General of the US (2021) *Confronting Health Misinformation*. (p. 8). Available at: https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf (Accessed: 18 March 2022)

[68] Serban A. M. et. Al. (2020) *Social Inclusion, Digitalisation and Young people. European Union and Council of Europe*. (p. 41). Available at: https://pjp-eu.coe.int/documents/42128013/47261953/053120+Study+on+SID+Web.pdf/0057379c-2180-dd3e-7537-71c468f3cf9d (Accessed: 14 March 2022)

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