Effectiveness and experiences of the SMILES' Workshops

What have schools and libraries learnt from SMILES?

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Colophon

The Hague University of Applied Sciences and the National Library of the Netherlands (Koninklijke Bibliotheek), 2023

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Summary

Between 1 March 2021 and 30 April 2023, a consortium (consisting of in the Netherlands: the National Library of the Netherlands (Koninklijke Bibliotheek -KB), The Hague University of Applied Sciences, the Netherlands Institute for Sound and Vision in Hilversum; in Belgium: Media & Learning Association in Leuven and Public Libraries 2030 in Brussels; and in Spain: Fundación Platoniq in Barcelona) carried out an Erasmus+-funded research project on news media literacy among young people. It involved Dutch, Belgian and Spanish young people aged 12-15. The acronym SMILES, which stands for 'innovative **methodS** for Media & Information Literacy Education involving schools and **librarieS**', was chosen for the project title.

The main goals of the SMILES project are:

- Forming pairs between librarians and secondary school teachers in the three European countries, who were empowered through train-the-trainer workshops to teach secondary school students about news media literacy in relation to disinformation;
- Helping students use digital technologies more safely and responsibly with a focus on recognising reliable and authentic information versus becoming more resilient to disinformation;
- Developing five building blocks serving as teaching materials for Dutch, Belgian and Spanish pupils aged 12-15 with the aim of making them recognise disinformation and making them more resilient against it;
- A scientific evaluation of the effectiveness of the implemented lessons through impact measurement using 'pre-knowledge tests' and 'post-knowledge tests';
- A strengthening of existing collaborations and creation of new collaborations between schools and libraries in the three partner countries.

The SMILES project was implemented through three work packages. In the first work package, five so-called 'Baseline studies', or literature reviews, were conducted. The focus was on what the different educational approaches in Spain, Belgium and the Netherlands are with regard to disinformation and how these approaches can be linked.

Based on these studies, the five building blocks were developed in the second work package. In addition, the teaching pairs were offered the training programme developed by SMILES through a 'train-the-trainer methodology' to safely and responsibly deploy the use of digital media tools during lessons with students. Also, based on the disinformation literature, the knowledge tests were designed to conduct an impact measurement of the train-the-trainer workshops and lessons among the trainers (teaching pairs) and students, respectively. These knowledge tests contained statements on disinformation that were answered correctly or incorrectly by respondents. The number of correctly answered statements prior to the lessons was compared with the number of correctly answered statements after the lessons. In this way, an attempt was made to prove a positive learning effect of the deployed lessons.

In the third work package, the results from the pre-knowledge tests and the post-knowledge tests were analysed. In addition to these quantitative analyses, qualitative results were also used to analyse and look at the extent to which the training provided to trainers (teaching pairs) and the lessons with the five building blocks for students proved effective in teaching, recognising and becoming more resilient to disinformation, respectively. In doing so, we also reflect on whether the methodology tested has been effective in the three countries: what are the best practices and where do we see areas for improvement?

The analysis shows that the statements from the knowledge tests do not sufficiently match the building blocks to establish a significant learning curve. However, the knowledge tests show that pupils themselves say they can tell the difference between disinformation and reliable news after following the lessons. In addition, students say they learned new things and want to know more about the subject of disinformation. The learning effect is also evident from the analysis of the qualitative data: the building blocks clearly have added value in teaching about news media literacy in relation to disinformation and journalism.

The knowledge tests filled in among the trainers (the teaching pairs) also show no significant differences between the number of correctly answered statements in the pre-training knowledge test and the post-training knowledge test and no clear differences between the countries can be observed. However, again on the basis of the qualitative data, it does appear that a large majority of the trainers feel able to deliver lessons to students themselves after the train-the-trainer workshops.

The various qualitative sources also show that teachers are very positive about the building blocks. They indicate that the building blocks are well constructed and add to the existing teaching materials. All trainers therefore indicate that they will continue to teach the building blocks developed by SMILES, although they will sometimes do so in modified form in the near future.

The present report concludes with recommendations for teachers and library professionals who want to get started with the building blocks developed and tested by SMILES.

1 The SMILES Erasmus+ project

1.1 Reason and goals

The National Library of the Netherlands (Koninklijke Bibliotheek) in The Hague, together with the other five partners, submitted a grant application to Erasmus+ in 2020 (Call 2020 Round 1 KA2 - Cooperation for innovation and the exchange of good practices) to conduct research on media literacy and combating disinformation among European young people aged 12-15. The acronym SMILES, which stands for 'innovative **methodS** for Media & Information Literacy Education involving schools and **librarieS**', was chosen for the project title.

The trigger for the application was the sharp increase in disinformation over the past decade (with this project choosing to consistently replace the term *fake news* and *fake news* with the more encompassing term *disinformation*), which was additionally fueled by the Covid-19 pandemic that visibly started in the Netherlands around the end of February 2020. The KB saw a strong need for a practical research project in which a European consortium - consisting of libraries, media literacy organisations and a university of applied sciences - would jointly develop and test new methods in the field of media literacy and information literacy, with the aim of getting secondary school students in the Netherlands, Belgium and Spain to recognise disinformation and make them more resilient to it.

Initially, the aim was to put a strong focus on the use of digital media combined with the use of striking disinformation examples taken from the Covid-19 pandemic. As the project progressed, this focus shifted to the background and this approach was abandoned. There are two reasons for this. First, Covid-19 was running out of steam in the countries mentioned in the first quarter of 2022. Second, disinformation started to play a bigger role in relation to other international developments, such as the war in Ukraine that broke out at the beginning of 2022. However, the common goal of the consortium partners remained intact. This is formulated pithily in the project application as follows: "the consortium is determined to contribute to a safer and more responsible use of digital technology, particularly among young people" (RD 2020: 2).

1.2 Methods and ideals

To achieve the goals described, two innovative approaches were envisaged:

1) Forming previously non-existent pairs between secondary school teachers and library professionals. And ensuring that - using a 'train-the-trainer approach' - they feel sufficiently equipped (with the right basic disinformation knowledge, skills and materials) to teach a SMILES-designed lesson plan of five building blocks (see chapter 3) to Dutch, Belgian and Spanish youngsters aged 12-15. Per country, the aim was to train and teach teaching 10 pairs (i.e. 60 professionals in total) and 200 pupils per country (i.e. 600 pupils in total) in the project. For a detailed justification of why we consider collaboration between teachers and librarians valuable in recognising and combating disinformation, please refer to the Handbook for Trainers (p. 27-28: available on the SMILES website under the heading Digital Toolkit: https://smiles.platoniq.net/processes/manualForTrainers).
2) Conducting an impact measurement in the disinformation interventions using knowledge tests, both among the trainers (teaching pairs) and students. The intended quantitative dataset that would result from this was extended with a qualitative dataset in a later phase of the project (see chapter 4).

The interim and final results of the research project have been documented and maintained on the joint SMILES website https://smiles.platoniq.net from the start of the project. On this website, the following can be found: the five so-called Baseline studies, including a Joint Summary Report (see chapter 2), the call for schools and libraries to participate in the trainings (see chapter 3), the digital toolkit (see chapter 3), news updates and a section with 'more information' about the project and partners, among others. The host of the website, Spanish consortium partner Fundación Platoniq, has committed to make this information available online for at least three years after the project ends.

Finally, the project is designed from the following three ideals:

- As an open-source project;
- With two learning strategies: blended learning and active learning;
- The choice of physical and online learning.

1.3 Research questions

The SMILES project focused on young people aged 12-15 years old, who were guided to use digital tools more safely and responsibly, improve their media literacy and use social media critically(er). Library professionals and teachers were equipped with the necessary knowledge, skills and competences to help these young people access reliable and authentic information versus disinformation, and teach them to recognise the distinction between the two types of news.

In the Erasmus+ grant application (p. 66-67), we formulate the following goals:

- Setting up a strategic partnership to test common innovative teaching methods in the field of (digital) media literacy, targeting library professionals and secondary school teachers, as well as schoolchildren aged 12-15;
- Work with library professionals in three European countries to provide practical guidance and training to secondary school teachers on disinformation, teaching professionals new skills for organising lessons on (digital) media literacy for secondary school students;
- Helping young people in secondary schools in three European countries use digital technologies more safely and responsibly with a focus on recognising reliable and authentic information versus disinformation;
- An evaluation of the effectiveness of the implemented lessons through impact measurement;
- A strengthening of existing and new collaborations between schools and libraries in the three partner countries.

We translated these goals into five research questions:

1. To what extent has the project succeeded in setting up a strategic partnership to test common innovative teaching methods in the field of (digital) media literacy aimed at library professionals and secondary school teachers, as well as secondary school students aged 12-15?
2. To what extent did the European consortium partners succeed in providing practical guidance and training to library professionals and secondary school teachers on disinformation, teaching them new skills for organising (digital) media literacy lessons for secondary school students?

3. To what extent have young people in secondary schools in three European countries been helped to use digital technologies more safely and responsibly with a focus on recognising reliable and authentic information versus disinformation?
4. To what extent are the implemented building blocks effective, as evidenced by evaluations through impact measurement?
5. To what extent have existing and new collaborations between schools and libraries in the three partner countries been strengthened?

1.4 International partners

As mentioned, this European project was carried out by consortium partners from the Netherlands, Belgium and Spain. The pooling of expertise and disciplines includes libraries, research & education, image and sound, media literacy and information literacy.

Consortium partners Netherlands

- Koninklijke Bibliotheek, The Hague - applicant and project sponsor
- The Hague University of Applied Sciences (Sustainable Talent Development lectorate and Philosophy and Professional Education lectorate), The Hague
- Netherlands Institute for Sound and Vision, Hilversum

Consortium partners Belgium

- Media & Learning Association, Leuven
- Public Libraries 2030, Brussels

Consortium partner Spain

- Fundación Platoniq, Barcelona

1.5 Timeline and governance structure

The project started on 1 March 2021 and initially had a duration of two years until 28 February 2023. Because schools needed more time to set out and complete the building blocks, Erasmus+ honoured an extension of the project until 30 April 2023.

The project - using English as the language of communication - started with a kick-off meeting on 18 March 2021. The governance structure was as follows:

- Nine 'Transnational Project Meetings' (TPMs) were held with all partners, both physically (with all countries hosting once) and online.
- Online 'Coordinator meetings' were held every 1-2 months where *project governance* topics were discussed such as: progress and planning, dissemination, potential risks, ongoing issues, interventions, financial issues, lessons learned and organisation of the TPMs.
- A quarterly online 'Project Management Board Meeting' was held where the focus was on achieving the project's goals such as: results, intended outcomes, impact, quality, cooperation between consortium partners, high risks, and key issues ("are we still on the right track?").

1.6 Reading guide

In chapter 1, we discussed the importance of the present research project: to make Dutch, Belgian and Spanish secondary school students aged 12-15 more aware of the dangers of disinformation and, for that reason, to make them digitally information- and news-savvy to recognise disinformation and make them more resilient against it. We then discussed the reason, goals, methods and ideals of the project, the research questions and how the consortium partners have set up a structure to cooperate with each other both physically and online during the project (2021-2023).

Chapter 2 discusses the work associated with the first work package. A total of five Baseline studies were conducted and documented in the Netherlands, Belgium and Spain, including a Joined Summary Report to explore and connect the different educational approaches in Europe with regard to disinformation. This led to the development of a shared methodology for disinformation teaching, which came to further development in the second work package. Furthermore, a start was made on the knowledge test for impact measurement.

In chapter 3, we discuss the second work package. Based on the results of the first work package, the second work package developed five so-called 'building blocks' as teaching materials for Dutch, Belgian and Spanish pupils aged 12-15 to recognise disinformation and make them more resilient against it. In addition, the teaching pairs (secondary school teachers and library professionals) were offered the customised training programme developed by SMILES through a 'train-the-trainer methodology' to safely and responsibly deploy the use of digital media tools during lessons with pupils. The pairs were also provided with a manual produced by SMILES plus a digital toolkit for this purpose. Also in this phase, the knowledge tests, with which an effect measurement was aimed at a total of 30 teaching pairs and 600 pupils, were developed and deployed.

Chapter 4 covers the third and also final work package. This work package focuses on the analyses of the knowledge tests. In addition to quantitative analyses, qualitative analyses were used to examine the extent to which the training given to trainers and the lessons with the five building blocks for students proved effective in teaching and recognising and becoming more resilient to disinformation, respectively. In doing so, we also reflect on whether the methodology tested has been effective in the three countries: what are the best practices and where do we see areas for improvement?

In Chapter 5, we conclude with a conclusion, reflection and recommendations. We look back at the main research findings and hope to inspire readers who also want to get started with the five building blocks (or own teaching materials to recognise and combat disinformation) how best to do so.

2 Baseline studies and impact measurement

2.1 Introduction

This chapter discusses the work associated with the first work package. A total of five Baseline studies were conducted and documented in the Netherlands, Belgium and Spain, including an overarching Joined Summary Report that examined and linked the different educational approaches in Europe with regard to disinformation (section 2.2). This led to the development of a shared methodology for five disinformation lesson plans (so-called building blocks: see section 3.2), which came to further development in the second work package. Furthermore, a start was made on designing the knowledge tests for impact measurement. These are discussed in section 2.3.

Timeframe work package 1
Work on the first work package started a day after the kick-off meeting, on 19 March 2021. Work ended on 31 August 2021, when the Baseline study reports were published at https://smiles.platoniq.net.

2.2 Baseline study and Joined Summary Report

Baseline study Belgium
In the first part, the Belgian report discusses the spread, impact and fight against disinformation and fake news in Flanders (Belgium). In the second part, it takes stock of interventions aimed at combating disinformation and fake news. The research methodology chosen is the use of a survey, interviews and extensive desk research. It looks at the policy and public agenda and interventions implemented in recent years in education in Belgium (Vanbuel, 2021).

Baseline study Spain
In the first part, the Spanish report discusses the relationship between disinformation and Covid-19 in the Spanish context. It discusses terms such as 'hoaxes', 'fake news' and 'infodemic' during the corona pandemic in Spain. The term disinformation has been around in Spain since 1984, but its strategies have existed in history for much longer. It also discusses how the Spanish government communicated during the pandemic, the impact of disinformation and how Spanish policy should combat disinformation. Important here is the commitment to media and information literacy and fact-checking platforms. The second part of the report discusses what resources and methodologies are already available in using digital media education to combat disinformation. Desk research was conducted and interviews were conducted. It is noted that libraries and library professionals hardly play a role yet in working with secondary schools where teachers do get trained to deliver building blocks on disinformation. The authors elaborate on the means used by education in Spain to combat disinformation. Think building blocks, workshops, videos, gamification. Other relevant projects are also discussed (Anducas & Nadesan 2021).

Baseline study Netherlands
The Dutch report starts with the authors' shared concern about the disinformation phenomenon. In this context, it also discusses the role of the SMILES project "with the aim of teaching young people (12-15 years old) to use digital tools more safely and responsibly, to increase their media literacy and to use social media critically" (Oomes, Smit & Camo, 2021: 4). The first part of the report discusses the spread, impact and countering of disinformation and fake news in the Netherlands. A 2018 Rathenau study shows that the spread of disinformation and fake news has been low in the Netherlands until then

compared to countries such as the US, France and Germany. With advancing digitalisation, technologisation, the growth of conspiracy thinkers and the Covid-19 pandemic, the Netherlands has caught up in this area. It then describes the means used from then on in the Netherlands to counter disinformation. Media literacy plays an important role here. The second part focuses on Dutch educational interventions and their methodologies. This information was obtained by conducting desk research. The third part of the report discusses the results of interviews with two types of experts: a) academic researchers and project developers in the field of media and digital literacy (in education) and b) library professionals. The latter group breaks down into librarians who work with secondary schools (boards and teachers) on media education educational programmes and education specialists who support local libraries in their services to and cooperation with schools (Oomes, Smit & Camo, 2021).

Baseline study Measurement instruments
The fourth Baseline study sets out a theoretical framework for assessment or measurement tools in the field of media and information literacy and thus forms the basis of the impact measurement developed by SMILES using 'pre-lesson knowledge tests' and 'post-lesson knowledge tests' (Van Helvoort, 2021: 3).

Joined Summary Report
The Joined Summary report contains the highlights from the first three baseline studies discussed from Belgium, Spain and the Netherlands. It is a summary report that ends with recommendations for the interventions to be developed from the second work package (the teaching programme), covering the building blocks, train-the-trainer workshops and knowledge tests (Van Helvoort, 2021).

2.3 Effect measurement using knowledge tests

The methodology of this research project consists of two large datasets:

1. Quantitative data (consisting of an anonymously administered pre-knowledge test and an anonymously administered post-knowledge test; these were administered both to students and their trainers). These knowledge tests scaffolding the knowledge before and the knowledge after the lessons teaching information literacy. This component, set up in the first work package, is discussed in this section.

2. Qualitative data (consisting of collected feedback from the students and their trainers after the lessons). Log files and surveys with open questions illustrate how the students and trainers respectively experienced the lessons and train-the-trainer workshops and let them reflect on their own learning processes. We discuss the qualitative research (the third work package) in chapter 4.

Methodology and test procedures
The quantitative results of this study were collected, among other things, by conducting a knowledge test prior to and after attending the lessons (by schoolchildren) and train-the-trainer workshops (by trainers). The aim of these knowledge tests was to find out the level of knowledge related to disinformation of the schoolchildren and their trainers before participating in the SMILES-building blocks and train-the-trainer workshops, respectively, and then their level of knowledge after attending the classes and workshops. These knowledge tests included statements on disinformation that respondents answered correctly or incorrectly. The number of correctly answered statements prior to the lessons is compared with the number of correctly answered statements after the lessons.

The content of the knowledge tests was developed during the first phase of the SMILES project: the first work package. To arrive at these knowledge tests, literature research was first conducted. Based on a number of key words and then using the snowball method, a number of relevant scientific studies were found. One of the articles is a study by Maskl, Ashley and Craft (2015). These authors published several studies in which they created and tested questionnaires containing scales for measuring news

media literacy. All these scales are based on the Potters Media Literacy Model (Potter, 2014). This model, and variations of it by Maksl et al (2015), distinguish four factors on the basis of which to assess whether someone is news media literate. These factors are:

1. Knowledge and understanding of how media are organised, what the content and effects of media are.
2. A personal media *locus of control*; the extent to which an individual feels in control of the influence of media on their life.
3. Skills; for example, access to media, but also skills related to analysing content, evaluating media and communication skills.
4. Information processing tasks; forming opinions, making decisions and solving problems.

For the present study, we start from these four main factors by which news media literacy can be measured. The further scientific articles found and the measurement tools used in them were classified into the above factors and to what extent they measured this factor. All articles found were read intensively and coded on topics. Particular focus was placed on articles that used measurement scales, as we will use these for the knowledge tests.

Several ways of measuring the extent to which students (and individuals in general) are news media literate are discussed in the literature. First, by measuring knowledge with a questionnaire or knowledge test; this way is most common in the literature. Second, skills assessment, for example by having people assess whether a news item is reliable. A third way is performance-based assessment; this mode of measurement focuses more on tasks similar to daily practice.

A number of questionnaires with scales to measure media literacy were found in the literature. For example, the scale by Maksl et al. (2015) in which news media literacy is divided into the following aspects for which subscales have been developed:

- Questions about processing thoughts on autopilot or mindfully.
- Questions on media *locus of control*.
- Questions on news media knowledge structures.

This first subscale leans heavily on self-reporting. An example of a question from this scale is "I don't like to have to do a lot of thinking". The scales developed by Ashley et al (2013) and those by Vraga et al (2015) also lean mainly on self-report. Maksl et al's (2015) scale has been used for follow-up research, including by Murrock et al (2018). But the latter focused only on the *locus of control* and media knowledge subscales from Maksl et al's (2015) study; for the first subscale, related to processing thoughts, they did not develop questions.
Ashley et al (2013) used a different model to develop their questionnaire. This model is based on knowledge and understanding of three key concepts:

- Authors and audience.
- Messages and meanings.
- Representation and reality.

Eristi & Erdem (2017) developed a questionnaire with a scale focusing on skills related to access, analysis, evaluation and communication. Again, this scale is based on self-report, but it is the only scale that measures the third factor, skills. However, analysis and evaluation skills can also be measured by standard questions such as those used by The Stanford History Education Group (Horn & Veermans 2019) or 'true/false' questions as described in Van Helvoort & Thissen (2021). Murrock et al (2018) offer some useful formulations for measuring *locus of control*: "I can avoid being misinformed by paying

attention to different sources of news" ('cross-checking') and "When I am misinformed by the news media, I can do something about it".

Knowledge keys with MIL scales
Based on the literature review conducted, it can be concluded that the scales of Maskl et al. (2015) (and the adaptations of this scale), as well as the scale and adaptations of Ashley et al. (2013), can be used to develop scale questions that can measure the factors knowledge and understanding (1) and *locus of control* (2). For measuring the factor skills (3), we can draw on the examples of Eresti & Erdem (2017), Murrock et al (2018), Horn & Veermans (2019) and Van Helvoort & Thissen (2021). Measuring the fourth factor, information processing tasks, is not discussed in the literature found. Perhaps because this factor is normally measured more holistically; developing a general assessment tool for this factor is difficult.

Ultimately, four knowledge tests were developed based on the models and scales found in the literature: a knowledge test administered before attending the train-the-trainer workshops and classes, respectively, and a knowledge test administered afterwards. Thus, two knowledge tests were developed for both trainers and students. Assessment scales were developed for five dimensions of media literacy:

- Knowledge and understanding of how media are organised (kmo);
- Knowledge and understanding of media content types (kmc);
- Knowledge and understanding of media effects (kme);
- Personal media *locus of control* (loc);
- Content analysis and evaluation skills (sk).

To measure the dimensions of media literacy, a number of statements were created for each dimension that together measure the extent to which schoolchildren and their trainers are 'news media literate'. The original knowledge tests, for validation, contain 25 statements. They also ask for background data such as gender, age, school level and language spoken at home. All statements can be answered with true/false or agree/disagree and a third option "I don't know". The knowledge tests completed after attending the lessons and workshops additionally contained a number of questions on how schoolchildren and trainers experienced the lessons and workshops, how they assessed their own level of knowledge afterwards and what they will do further with the topic of disinformation.

Validate
The final knowledge tests were assessed by colleagues from The Hague University of Applied Sciences, participants of the SMILES project and by a researcher from the Universitat Pompeu Fabra (UPF) in Barcelona, Mittzy Arciniega. Arciniega is involved in Edumediatest, another media literacy assessment project funded by the European Commission. The knowledge tests were then submitted to 97 HBO-ICT bachelor students from The Hague University of Applied Sciences (of which 87 were male, 8 female and 2 other). The results were analysed using a reliability test in SPSS. This test was performed three times so that only items with sufficient correlation remained (see Table 1 in Appendix 5). Finally, 10 questions were removed from the trainers' knowledge test and 15 statements remained.

Because the age and educational level of undergraduate students at The Hague University of Applied Sciences is expected to be higher than the students aged 12-15 in this study, and almost equal to the level of trainers, only in the 'train-the-trainer' knowledge tests were scaffolds removed. Validation of the student knowledge tests was done only after the knowledge test came out of the field. See the results of this validation in Table 2 in Annex 5. In the end, one question was removed from the student knowledge test and 24 scaffolds remained.

2.4 Conclusion

For each country, a literature review was conducted in the first work package to investigate the state of disinformation in that country. Remarkably, disinformation appeared to be a relatively new concept in the Netherlands which took off, particularly due to the corona pandemic. After analysing literature on disinformation and the ways in which news media literacy has been measured in the literature, knowledge tests with subscales were drawn up. These knowledge tests were administered to the target groups of the SMILES project: trainers (teachers and library professionals) and students aged 12-15. Both groups completed a knowledge test both before the first workshop/lesson and after the last workshop/lesson. Finally, by analysing these two completed knowledge tests, we looked at whether quantitative learning effects could be seen among the students and their trainers. In the knowledge tests administered after the workshop/lesson, respondents were also asked to answer a number of statements about how they rated their own knowledge and what they thought of the lessons and topic. In addition to this quantitative analysis, qualitative data were also collected. This was done in different ways, such as collecting verbal feedback and a focus group interview.

3 Building blocks and train-the-trainer workshops

3.1 Introduction

In this chapter, we discuss the second work package. Based on the results of the first work package, the second work package developed five so-called 'building blocks' as teaching materials for Dutch, Belgian and Spanish pupils aged 12-15 to recognise disinformation and make them more resilient to it. These contents of these building blocks are discussed in section 3.2.

In addition, the teaching pairs (secondary school teachers and library professionals) were offered SMILES' customised training programme through a 'train-the-trainer methodology' to safely and responsibly deploy the use of digital media tools. The teaching pairs were also provided with a manual produced by SMILES plus a digital toolkit for this purpose. We discuss this in section 3.3. Also in this phase, the knowledge tests (section 3.4), with which an effect measurement was envisaged among a total of 30 pairs and 600 pupils (in Spain, Belgium and the Netherlands), were developed and deployed.

Timeframe work package 2
Work on the second work package started on 1 September 2021 (immediately after completion of the baseline studies of the first work package) and continued until 17 February 2023. This period was divided into a number of intermediate phases:

1) Preparation of work package 2: 01-09-2021 to 31-03-2022.
2) Preparation of train-the-trainer workshops and adjustments to work package 22: 01-04-2022 to 30-06-2022.
3) Train-the-trainer workshops: 01-04-2022 to 12-10-2022.
4) Provision of the five building blocks in schools: 03-10-2022 to 17-02-2023.
5) Completion and modification of equipment: 17-02-2023 to 28-04-2023.

3.2 Building blocks and learning objectives

Five teaching building blocks were developed (numbered Building blocks A to E) that served as teaching materials for pupils aged 12-15 from secondary schools in the Netherlands, Belgium and Spain. Below, we briefly discuss the content of these building blocks to give an idea of the 'ready-made' lesson plans that teachers and library professionals used to get started with pupils. More information can be found on the SMILES website, under the heading Digital Toolkit:
https://smiles.platoniq.net/processes_groups/6

Building block A: What is disinformation?
This building block was created by the Netherlands Institute for Sound and Vision in Hilversum. The teaching pairs are explicitly advised to choose and cover local examples of disinformation campaigns themselves, posing open-ended questions to students. Lesson plan A briefly contains the following chronological elements:

- Theory: the distinction between disinformation and reliable information. And the role of news, journalists and news organisations.

- An interactive work form on news, information and opinion formation. The importance of journalism and press freedom.
- A video explaining disinformation in more detail.
- A quiz exploring tactics and manipulation techniques.

Learning objectives Building block A

- Students can explain what disinformation is and they can explain the difference between disinformation and reliable information.
- Students can explain how solid journalism is created.
- Students gain knowledge of different forms of misleading news.
- Students develop critical and questioning attitudes towards media. A critical attitude towards media refers to the ability to analyse, compare and select media reports. This enables them to find out the purpose of different messages in order to recognise misleading, false and incomplete information (Imedial, 2020). A questioning attitude refers to asking ourselves what kind, type of content it is, where it is published and who benefits from it (Matthews, 2019).

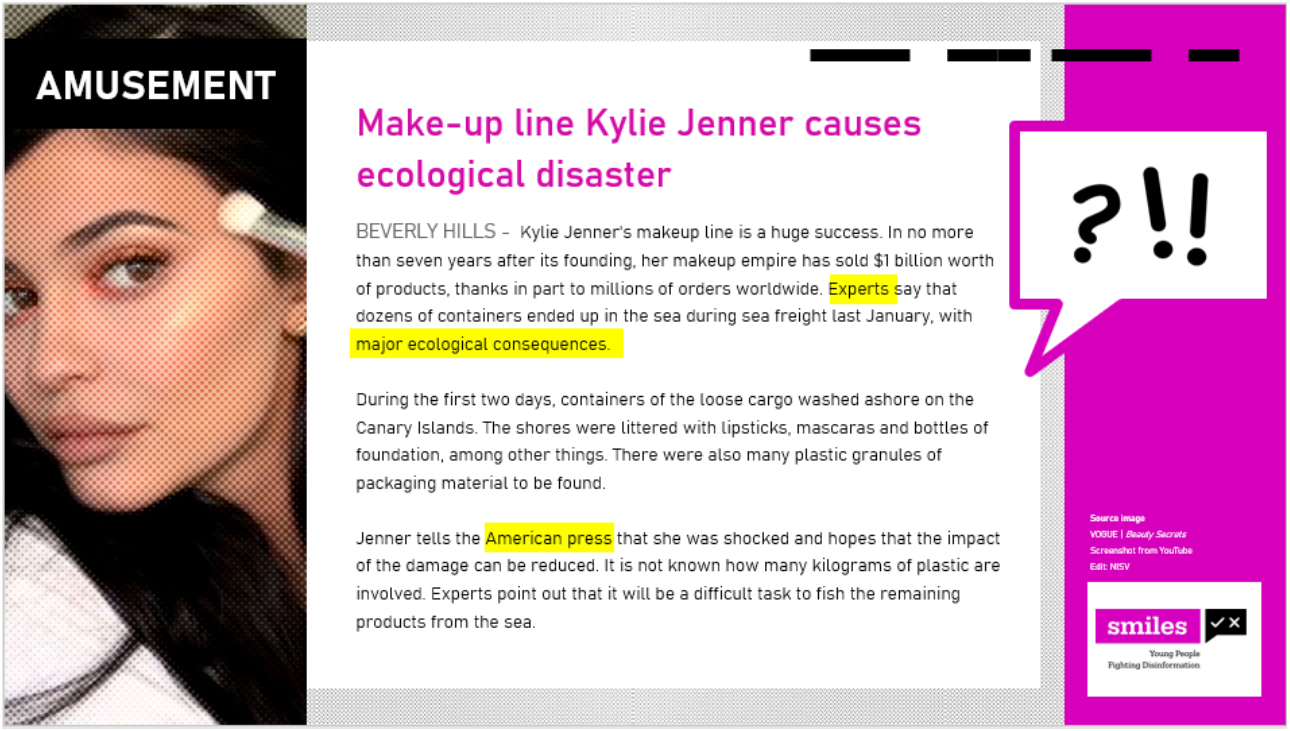

Figure 1: assignment from building block A

Building block B: How to detect and resist disinformation?
This building block was created by Media and Learning Association in Leuven (Belgium). This building block aims to help students detect (identify) and fight or resist disinformation in a practical way, focusing on students' digital skills and knowledge. This is done through an interactive online game called *The Checkington Daily News*. In this game, pupils step into the shoes of a budding journalist who has to complete five different tasks (mini-games) to become a professional journalist. The focus is on how not only journalists, but in fact everyone, can correctly analyse, report and share information. Lesson plan B briefly contains the following chronological elements:

- Minigame 1: mapping different sources and information.

- Minigame 2: data visualisation.
- Minigame 3: algorithms and filter bubbles.
- Minigame 4: online graphics.
- Minigame 5: social media accounts.

Learning objectives Building Block B

- Students can recognise and distinguish disinformation from reliable information.
- Students can recognise and demonstrate the incorrectness or misuse of graphs.
- Students can understand personalised data and can apply new (sub)search strategies to get out of fixed search patterns.
- Students can identify computer-generated images, manipulated pictures or images taken out of context.
- Students can use device and account settings to use social media safely and block disinformation.

Building block C: Techniques being used
This building block was created by the Netherlands Institute for Sound and Vision in Hilversum. Students create their own disinformation campaign. The inoculation theory was used for this assignment. The theory in which participants gain insight into methods of disinformation dissemination by applying them themselves, in watered-down form. Lesson plan C briefly contains the following chronological elements:

- Theory: common contemporary manipulation techniques, followed by a discussion.
- An assignment in which students apply manipulation techniques in all kinds of content for a disinformation campaign.

Learning objectives Building block C

- Students recognise different manipulation techniques meant to influence audiences.
- Students are more sensitive to recognising possible manipulation.
- Students can act analytically and critically when a message is not trusted.

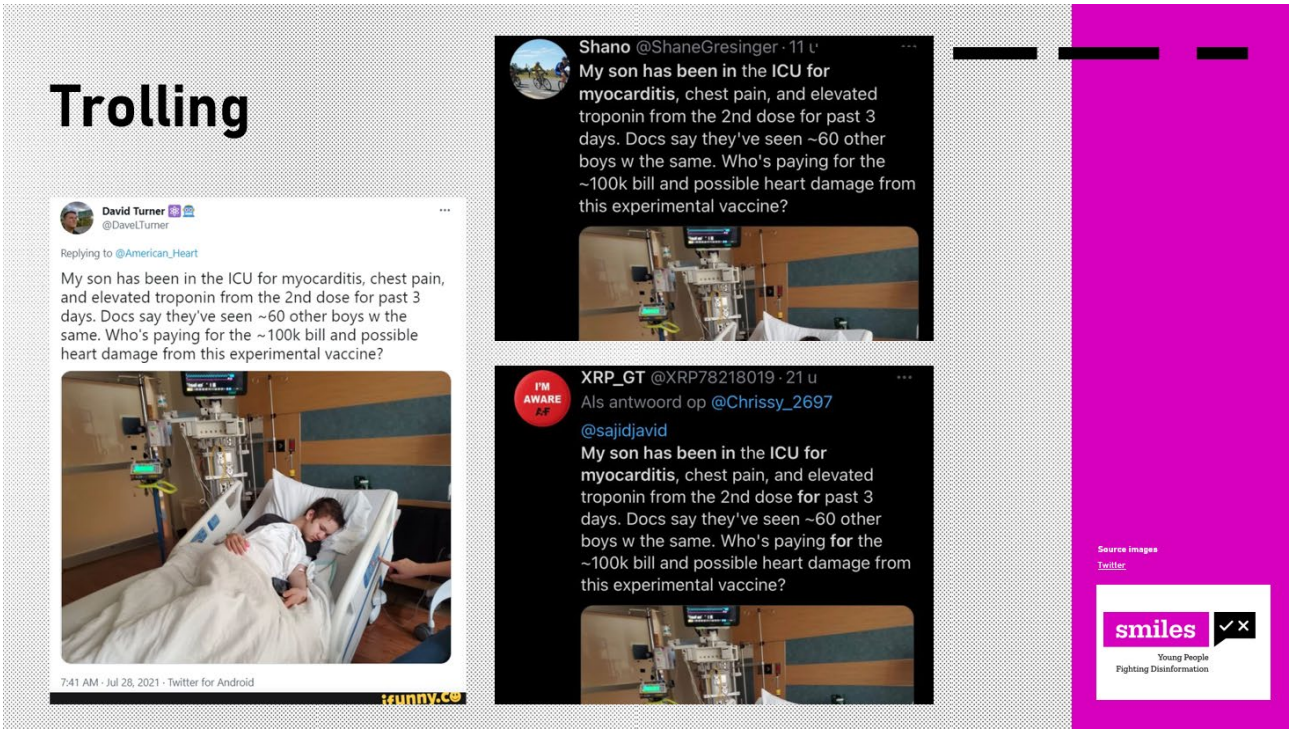

Figure 2: Assignment from building block C

Building block D: How is disinformation being spread?
This building block was created by the Netherlands Institute for Sound and Vision in Hilversum. Students learn about the strategies used in disinformation campaigns. Lesson plan D briefly contains the following chronological elements:

- The online game *Harmony Square* consisting of four short levels, about a small village obsessed with democracy. The player plays the role of someone hired as 'Chief Disinformation Officer', who must deliberately disrupt the peace and quiet of the square by inciting division and turning residents against each other.
- It zooms in on the different strategies used in a disinformation campaign.
- Watching an animation on disinformation strategies.
- An assignment in which students create their own strategy for a disinformation campaign; using a timeline, the campaign is built step by step.

Learning objectives Building block D

- Students can explain why and how disinformation is spread (role of trolls; role of sharing).
- Students understand how a campaign is created step by step.

Building block E: Disinformation and society
This building block was created by Fundación Platoniq in Barcelona. The building block reflects on the collective and emotional impact of disinformation. The teaching pairs carry out two activities in which students start thinking about disinformation in a historical way and how disinformation affects us both on a societal and personal level. Lesson plan E briefly includes the following chronological elements:

- A warm-up.
- Creating a timeline of disinformation through history that critically explores past impact.
- Using a canvas of more current disinformation, allowing students to map how disinformation affects people collectively and individually.
- Reflection and discussion on the impact of disinformation on society with students sharing their emotions, reactions and thoughts.

Learning objectives Building block E

- Students gain knowledge about historical disinformation and its impact.
- Students gain knowledge about different levels of what disinformation can affect.
- Students can reflect and discuss the influence and impact of disinformation on society and their own personal situations.

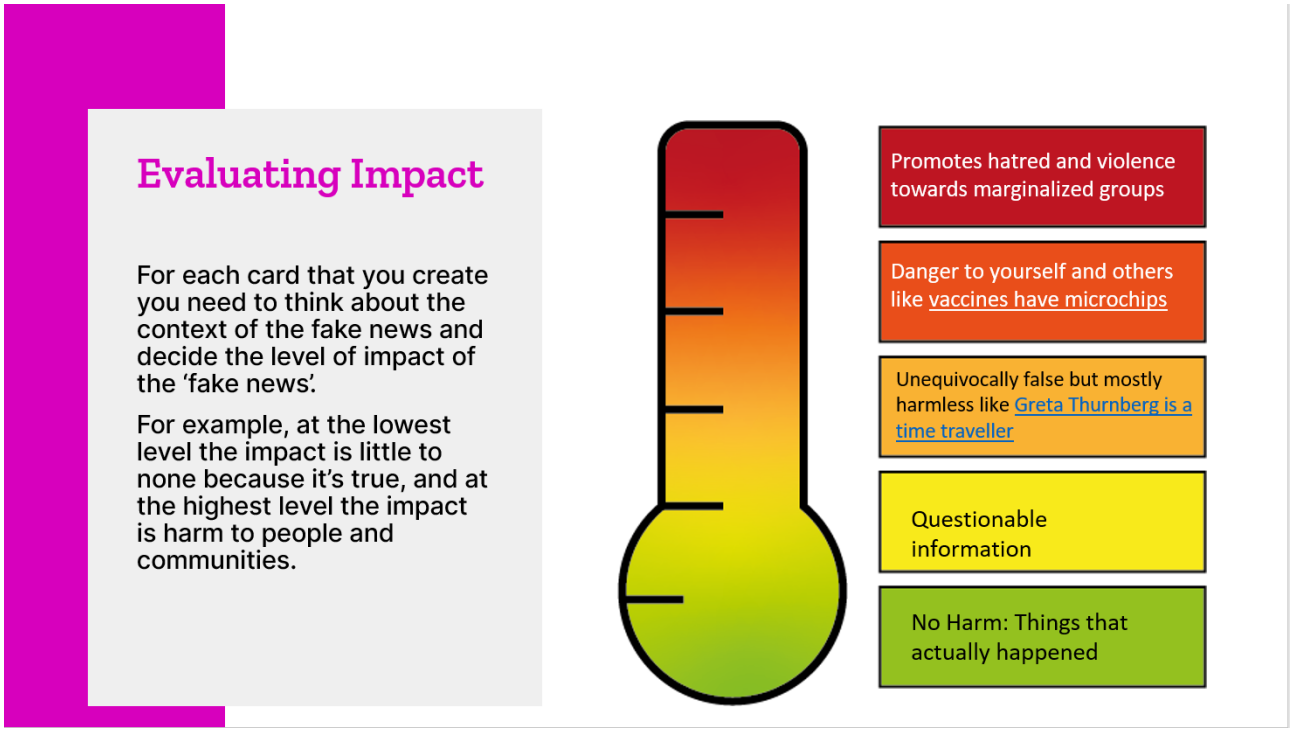

Figure 3: assignment from building block E

3.3 Train-the-trainer workshops

Train-the-trainer workshops took place between early April and the end of September 2022. In the period before that, library professionals and teachers from the Netherlands, Belgium and Spain were recruited to participate in the SMILES pilot. The recruitment was done through a call on the SMILES website, and through the various networks of the consortium partners themselves. Formulated more broadly, the target group of the train-the-trainers workshop consists of: secondary school teachers,

librarians, school librarians, youth workers and media coaches. The professionals from the education and library field were then helped on their way with a *Manual for Trainers*. This manual can be found on the SMILES website, under the heading Digital Toolkit: https://smiles.platoniq.net/processes/manualForTrainers. The manual is available in four languages: Dutch, Spanish, Catalan and English. The manual covers the following topics:

- Chapter 1: describes an introduction, the purpose of the project, why digital literacy and disinformation are important, who the manual is for and how it is structured;
- Chapter 2: summary of building blocks A to E with directions on how to use the building blocks;
- Chapter 3: provides full instructions for using the five building blocks in the classroom;
- Chapter 4: provides tips and tricks for teachers & librarians, for collaboration in general and discusses how to create a safe learning environment for students;
- Chapter 5: conclusions;
- The annex of the toolkit discusses the importance of impact measurement and the timeframe within the curriculum on which the knowledge tests can best be completed so that a good impact measurement emerges.

Train-the-trainer workshops in practice
The aim of the project was to train teaching pairs so that they themselves could deliver lessons (using the five building blocks) to schoolchildren. In the application, the plan was to train 10 teachers and 10 librarians per national partner to deliver the lessons. This proved difficult to achieve in practice. Partners also filled in the lessons in different ways. Belgium organised both a physical, and an online workshop. At the online workshop, 10 pairs were present. Some of them had a dual role and were both librarians and teachers. The physical training took place at different times and covered a half-day session. This involved a total of 20 participants with different roles, including youth workers, teachers and librarians. In the Netherlands, a physical train-the-trainer workshop took place, lasting 2 working days. On the first day, 16 participants were present, on the second day 15. In Spain, the train-the-trainer workshop also consisted of 2 days, on which 16 and 13 participants respectively were present, and an extra third workshop day for participants who could not participate on the first 2 days; 6 people attended.

Number of participating schools, libraries and pupils
The plan was for 10 schools per country to participate in the SMILES project, reaching a total of 600 schoolchildren. This was not achieved in every country. In the Netherlands, 10 schools had been found willing to deliver the lessons, but ultimately not every school managed to actually implement the project. This was partly due to scheduling problems and a lack of space in the curriculum. In the end, the building blocks were taught at eight schools, in different classes and at different levels. Secondary education in the Netherlands lasts 4, 5 or 6 years, depending on the type of education. Preparatory secondary vocational education (vmbo) lasts 4 years and is intended for 12- to 16-year-olds. The vmbo is divided into four streams, of which the theoretical programme is the highest level. This is followed by the mixed course, the framework vocational course and the basic vocational course. Higher general secondary education (havo) lasts five years. There is more room for deeper learning than at vmbo and students at havo have to work more independently. Preparatory university education (vwo) lasts 6 years. There is a lot of room for deepening. The building blocks were taught mainly to mavo/vmbo-t level (8 classes) and havo level (5 classes, including 2 classes with young people with Autism Spectrum Disorder). In 7 classes, lessons were provided by a librarian in combination with a teacher. In 2 cases by a school librarian combined with a teacher and in 1 case by a trainer who was both a librarian and a teacher. In total, an estimated 365 pupils were reached in the Netherlands.

In Spain, 9 schools participated in the SMILES project. Of these 9, 5 were schools in which lessons were delivered by a collaboration of schools and libraries; in 4 schools, the building blocks were taught by teachers alone. A total of 130 pupils were reached.

In Belgium, only three schools were found willing to participate in the SMILES project. In one of those schools, the lessons were provided by a partnership between the teacher and the librarian, in the other two schools only by the teacher himself. In total, an estimated 75 schoolchildren were reached.

A total of about 570 pupils were thus reached, almost reaching the targeted 600 pupils. It proved difficult in Spain and Belgium to get libraries and schools to work together, as that relationship is not a given there. In the Netherlands, there is originally a more crystallised cooperation between libraries and schools, but it turned out not to be present in all Dutch regions.

3.4 The knowledge tests

A total of 12 knowledge tests have been designed:

1. Dutch-language knowledge test prior to lessons for students from the Netherlands.
2. Dutch-language knowledge test prior to lessons for students from Belgium.
3. Spanish-language knowledge test prior to classes for students from Spain.
4. Dutch-language knowledge test prior to the train-the-trainer workshops for trainers from the Netherlands.
5. Dutch-language knowledge test prior to the train-the-trainer workshops for trainers from Belgium.
6. Spanish-language knowledge test prior to the train-the-trainer workshops for trainers from Spain.
7. Dutch-language knowledge test after the lessons for students from the Netherlands.
8. Dutch-language knowledge test after the lessons for pupils from Belgium.
9. Spanish-language knowledge test after lessons for students from Spain.
10. Dutch-language knowledge test after the train-the-trainer workshops for trainers from the Netherlands.
11. Dutch-language knowledge test after the train-the-trainer workshops for trainers from Belgium.
12. Spanish-language knowledge test after the train-the-trainer workshops for trainers from Spain.

The knowledge tests contained the same statements for each country, except that different local examples were used. For example: in the Netherlands we are familiar with the news broadcast aimed at children *Jeugdjournaal* and in Belgium this example is replaced by their version of this broadcast called the *Karrewiet* in the same question.

All statements can be answered with 'true'/'false'/'don't know' and have a correct answer. Respondents are thus tested on their knowledge about disinformation and ultimately obtain a test score. The number of correctly answered statements, the test score, prior to the lessons is compared with the number of correctly answered statements after the lessons.

We limit ourselves in the present report to the representation of the Dutch-language knowledge tests, because - apart from local examples that differ slightly from country to country - they are otherwise identical in design to the knowledge tests of Belgium and Spain:

- Appendix 1 contains the Dutch language knowledge test prior to the lessons for students from the Netherlands;
- Appendix 2 contains the Dutch-language knowledge test prior to train-the-trainer workshops for trainers from the Netherlands;
- Appendix 3 contains the Dutch-language post-lesson knowledge test for students from the Netherlands;
- Appendix 4 contains the Dutch-language knowledge test after the train-the-trainer workshops for the trainers from the Netherlands.

3.5 Quantitative method: knowledge tests

Data collection
The knowledge tests are programmed in a special survey tool used by the KB for various studies, namely Crowdtech. Each partner country has its own knowledge test; the Dutch and Belgian versions are in Dutch. The Spanish version is in Spanish. All knowledge tests contain local examples, e.g. from local media. Google Translate and the help of the Spanish consortium partners were used to translate the Spanish knowledge test. For both target groups, students and trainers, there is a knowledge test prior to attending the workshops/lessons, and a knowledge test taken after the workshops/lessons. So for each country there are 4 knowledge tests, a total of 12 knowledge tests. The knowledge test for the trainers measures the news media literacy knowledge of the teachers and library professionals before and after attending the train-the-trainer workshops. Among secondary school students, the knowledge tests measure their knowledge related to news media literacy before and after attending the five SMILES building blocks.

The knowledge tests were submitted to trainers and scholars with a general digital link. Under the GDPR legislation, collecting e-mail addresses was cumbersome. Therefore, some control questions were included in the knowledge tests so that the knowledge tests of the same respondent could be linked together afterwards. These control questions consist of the question about the day of birth (two digits), the first two letters of the street where the respondent lived at the time of participation and the last two digits of the personal mobile phone number. These (portions) of data are not traceable to an individual.

The method of distributing the knowledge tests was different for each target group. The trainers were sent a digital link even before they participated in the train-the-trainer workshops with a request to fill in the pre-training knowledge test. The post-training knowledge test was emailed again after the last training day. No e-mail addresses of the students were known. In addition, it was expected that the response rate would be very low if students had to complete a knowledge test in their own time. Therefore, the pre-lesson knowledge test was completed in class during the first lesson at school and the post-lesson knowledge test was completed in class during the final lesson at school.

The pre-knowledge test results of the students and their trainers were downloaded from Crowdtech and loaded into SPSS Analytics. For each knowledge test, there is a separate dataset. That means there are three datasets for both groups (students and trainers). The results of the statements from the different countries were merged, with a variable added to reconstruct which country the schoolchildren came from. The results regarding the demographic characteristics of the pupils and trainers were analysed country by country, as the answer codes here differed per knowledge test. The question concerning the language spoken at home is multiple choice; respondents could choose several

answers. Therefore, the total does not add up to 100%. In other cases, the total sometimes does not add up due to rounding differences. The answers to the statements given by the pupils and trainers were scored by indicating for each question whether the correct answer was given. This was done by creating a new variable for each question where a 1 was assigned for the correct answer and a 0 for the wrong answer or when "I don't know" was chosen. Finally, a total score was calculated for each student and for each professional (working as a teacher or in the library field) by adding up all these scored variables.

In the end, all responses from the schoolchildren; from all countries and from both knowledge tests, were merged into one dataset for further analysis. The same was done for all trainers' datasets. The pupil datasets remained separate from those of the trainers. This was necessary because the number of statements in the students' knowledge tests differed from the number of statements in the trainers' knowledge test. The analysis looked at whether the train-the-trainer workshops and lessons caused the knowledge level of both trainers and pupils to increase. The results of this can be read in section 4.2.

3.6 Conclusion

In the second work package, five educational building blocks were developed (numbered Building blocks A to E) that served as workshop materials for students aged 12-15 from secondary schools in the Netherlands, Belgium and Spain. In summary, this is the content of the building blocks, with certain learning objectives associated with each building block as discussed:

- Building block A: What is disinformation?
- Building block B: How to detect and resist disinformation?
- Building block C: Techniques being used.
- Building block D: How is disinformation being spread?
- Building block E: Disinformation and society.

The project was structured so that pairs (teachers and library professionals) who were going to deliver the building blocks to schoolchildren first underwent a two-day training themselves. In the application, the plan was to train 10 teachers and 10 library professionals per national partner to deliver the lessons in the schools. This proved difficult to achieve in practice because of institutional differences between countries (in the Netherlands, libraries and schools have traditionally been used to working together). Nor was a two-day training organised in every country: in some countries, the training took place partly digitally, as this lowered the threshold for participation. Besides the training sessions, a handbook was also available for the pairs in which all building blocks were clearly explained.

The effectiveness of the building blocks was measured in part by the quantitative research through the knowledge tests. These knowledge tests contained statements that had to be answered by the respondent with 'true', 'false' or ''don't know'. The number of correctly answered statements constituted the final score. There was a knowledge test administered before attending the workshops and classes and one administered afterwards. The knowledge test for the trainers measured the news media literacy knowledge of the teachers and librarians before and after attending the train-the-trainer workshops. Among the secondary school students, the knowledge tests measured their knowledge related to news media literacy before and after attending the five classroom building blocks. The knowledge tests were almost identical, except that the trainers' version contained fewer statements than the students' version. Moreover, the trainers' knowledge test contained additional open-ended questions.

4 Survey results

4.1 Introduction

This chapter covers the third and also final work package: the results and analysis of the quantitative survey data (section 4.2) and qualitative survey data (section 4.3). We first discuss the results of the quantitative datasets. In this section, we answer research question 4: To what extent are the implemented building blocks effective, as evidenced by the evaluations through impact measurement? The detailed results and analyses can be found in Annex 5. The conclusion follows in section 4.4.

Timeframe work package 3
Work on work package 3 started after summer 2022 and was completed on 28 April 2023.

4.2 Quantitative results

Both trainers and pupils were asked to complete a knowledge test via a digital link prior to attending the train-the-trainer workshops and the lessons afterwards, respectively. The Dutch version of the knowledge tests they were presented with are attached in Appendices 1 to 4. In the following, the results of the knowledge tests for both groups are discussed, first for the students and then for the trainers.

Results of the total number of pupils
A total of 547 knowledge tests were completed by schoolchildren. Of these, 298 were pre-lesson knowledge tests related to attending classes and 249 were post-lesson knowledge tests. This means that not all pupils completed a knowledge test. What exactly is the percentage that did fill it out cannot be said because we do not know the exact number of pupils, only estimates based on the trainers' data. To try to link these two tests, there were some control questions included in the knowledge tests. Unfortunately, most of the completed tests could not be linked. This could be because a respondent only completed a knowledge test at one point in time, or because a respondent answered the three control questions differently in one knowledge test than in the other knowledge test. Because tests cannot be linked at an individual level, a comparison was made only on the total average score of all completed pre-lesson knowledge tests and the total average score of all completed the post-lesson knowledge tests. The pre-lesson knowledge test was completed a total of 298 times among European students: 186 times in the Netherlands, 41 times in Belgium and 71 times in Spain. The post-lesson knowledge test taken after lessons was completed a total of 249 times: 127 in the Netherlands, 38 in Belgium and 86 in Spain. This means that by no means all pupils completed the knowledge test.

A final score was calculated for all students with the number of questions they answered correctly. The knowledge test consisted of 24 statements, so the maximum number of points to be scored is 24. The average score achieved by pupils in the knowledge test prior to attending classes is 12.8. The score obtained by pupils in the knowledge test after attending classes is 12.3, which is slightly lower. This difference is not significant. In other words, we cannot demonstrate with the knowledge tests that or to what extent a learning effect occurred. So we do not see a clear 'cause and effect story'. Later in this research report, however, we will argue that the qualitative data give indications that a learning effect did occur, because the qualitative data were collected in a different way. Also, the answers to the statements from the knowledge tests completed afterwards do show that both trainers and students themselves felt they had learned. See below in this section.

There are some differences between the scores achieved by pupils from the different countries, but these differences are not significant. In the graph below, the scores achieved by pupils in both the pre- and post-lesson knowledge test are juxtaposed. The graph also includes these scores per country.

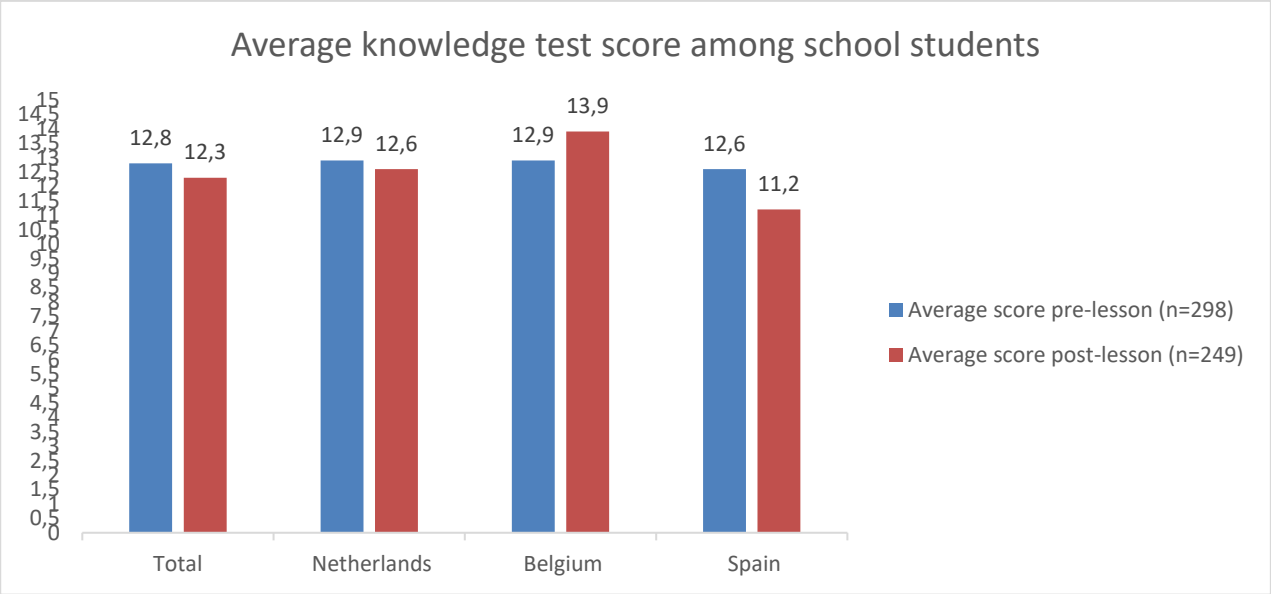

Chart 1 Average score of knowledge tests among students

Following the literature review described in Chapter 2, the knowledge tests were developed that included rating scales for five dimensions of media literacy:

- Knowledge and understanding of how media are organized (kmo);
- Knowledge and understanding of media content types (kmc);
- Knowledge and understanding of media effects (kme);
- Personal media *locus of control* (loc);
- Content analysis and evaluation skills (sk).

To measure each dimension, a number of statements were devised for each dimension, which students should say whether they are correct or incorrect. Based on these, the final score was calculated. In addition, a score per dimension was also calculated for the students. No significant results can be seen in the scores per dimension either, even when viewed by country. See the graph below for the scores per dimension for the total number of pupils.

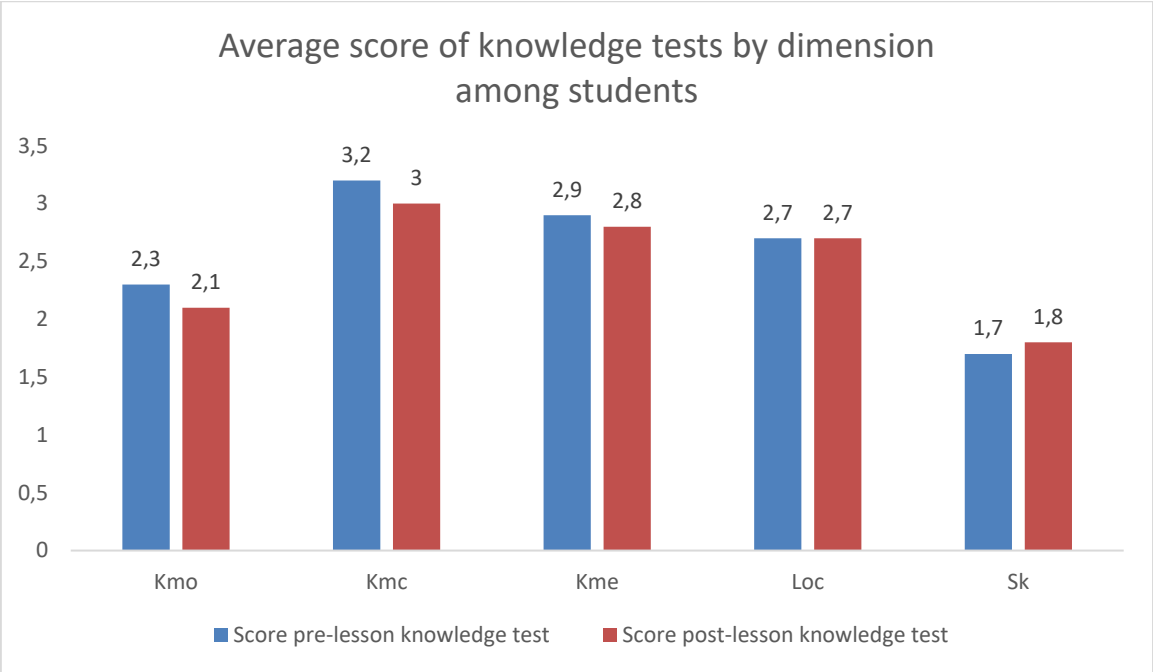

Chart 2 Average score of knowledge tests by dimension among students

In the knowledge test submitted to the pupils afterwards, several more questions were asked to find out what pupils thought of the lessons with the building blocks and whether they felt they learned more as a result. These questions showed that almost half of the pupils said they learned a lot of new things. 43% enjoyed taking part in the lessons and 43% say they will put what they learned into practice (this percentage is even higher among Belgian pupils). 55% think they will be able to tell the difference between disinformation and reliable news after taking part in the lessons; this percentage is as high as 63% in Belgium, while it is somewhat lower in Spain, at 44%. More than a quarter of pupils say they would like to learn more about the subject of disinformation; in Spain this is as high as 35%. From these figures we can conclude that, although the analysis of the effect measurements shows no significant learning effect, the pupils themselves feel they learned a lot from the lessons. They also indicate that they will change their behaviour as a result of what they have learned, and that they want to know more about the topic of disinformation. This does allow us to conclude a positive learning curve from this part of the quantitative study.

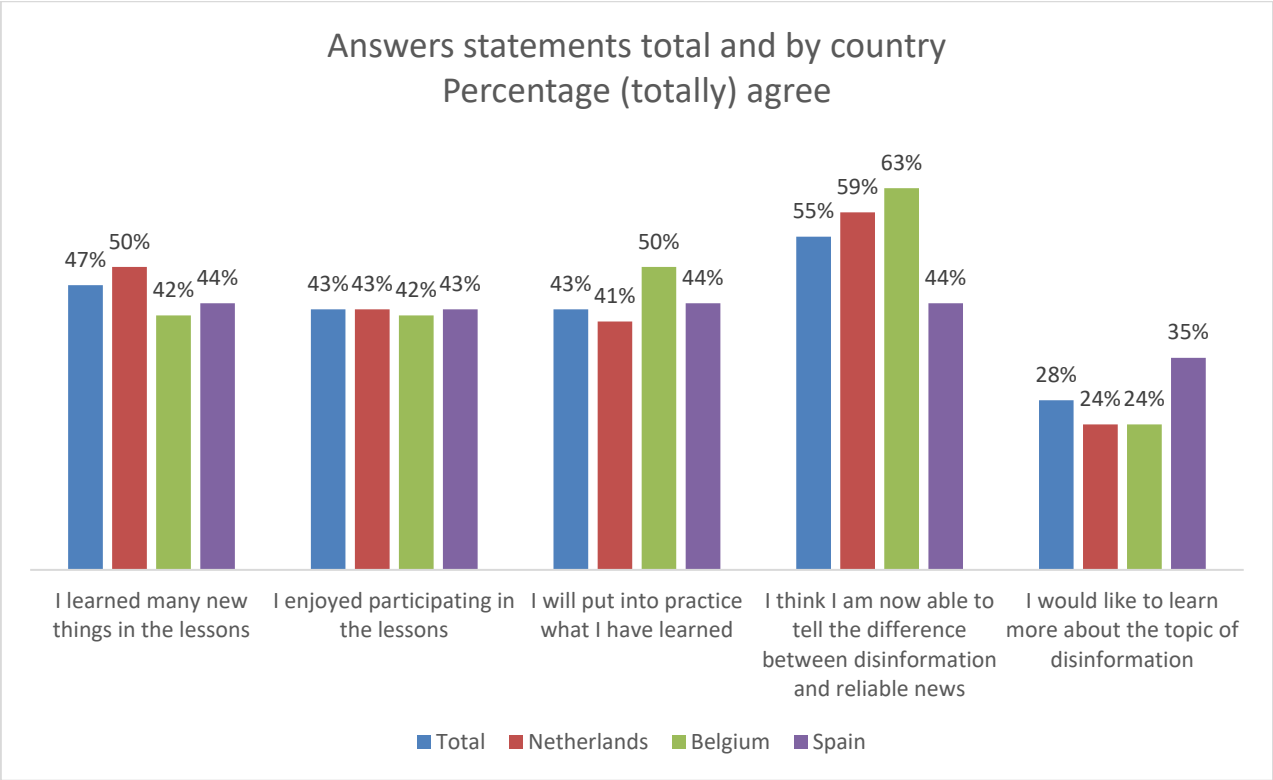

Chart 3 Answers statements regarding self-assessment knowledge, evaluation of lessons and interest in subject disinformation among students total and by country

'Pre-training knowledge test' results of total teachers and library professionals

A total of 56 knowledge tests were completed by trainers. Of these, 34 were knowledge tests before attending the training; 12 in the Netherlands, 9 in Belgium and 13 in Spain. There were 22 knowledge tests completed after the training; 16 in the Netherlands, 8 in Belgium and 17 in Spain. This means that not all trainers completed the knowledge tests. What exactly is the percentage that did complete it cannot be said, because we do not know the exact number of teachers and library professionals, who eventually taught the building blocks. Not all participants in the train-the-trainer workshops eventually taught the building blocks, and yet other participants involved colleagues in teaching the building blocks, who had not participated in the train-the-trainer workshops. Similarly, in the case of the trainers' knowledge tests, it was not possible to link the 'pre-training knowledge tests with the post-training knowledge tests. Therefore, only the overall averages were analysed.

In the knowledge test for trainers, there are 15 statements, so the maximum score to be obtained was 15 points. This was not achieved by anyone. On average, European trainers scored 10.6 points in the pre-training knowledge test and 11.8 points in the post-training knowledge test completed. The post-training score is thus slightly higher than the pre-training score, but this difference is not significant. The mean across countries differs, but this difference is also not significant. From these results, we can conclude that even among trainers, no significant learning effect is evident from the knowledge tests. See the graph below for the difference in scores before and after attending the training, and the results for each country.

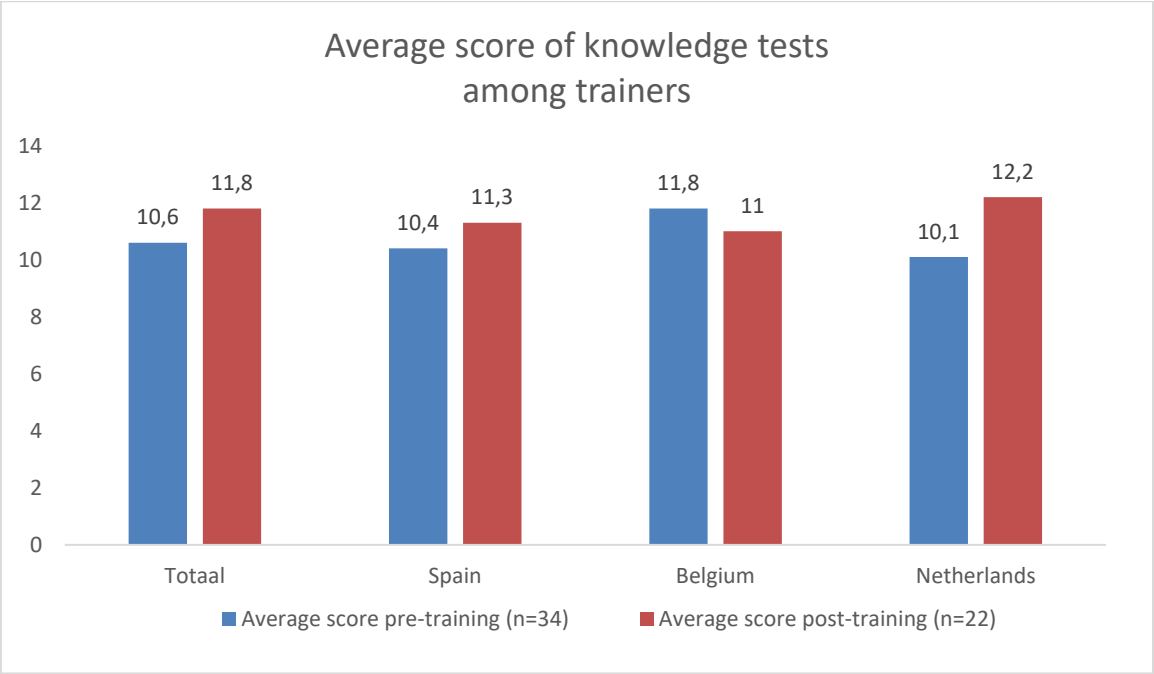

Chart 4 Average score of knowledge tests among trainers

In the analysis of the trainers' results, it was not possible to calculate scores on the five dimensions of media literacy, because some dimensions are based on only one question. In addition, the number of respondents among trainers is too low to make meaningful statements.

The aim of the train-the-trainer workshops was to prepare teachers and library professionals to teach the five building blocks on disinformation to students aged 12-15. Therefore, the knowledge test completed after the training asked whether professionals felt able to deliver media literacy training on disinformation themselves. As can be seen in the graph below, a total of 68% agreed with this statement. The results vary by country, with the highest percentage agreeing (completely) with this statement in the Netherlands (71%) and the lowest in Belgium (60%). From these figures, we can conclude that the goal of getting trainers ready (teaching pairs) to teach has largely succeeded.

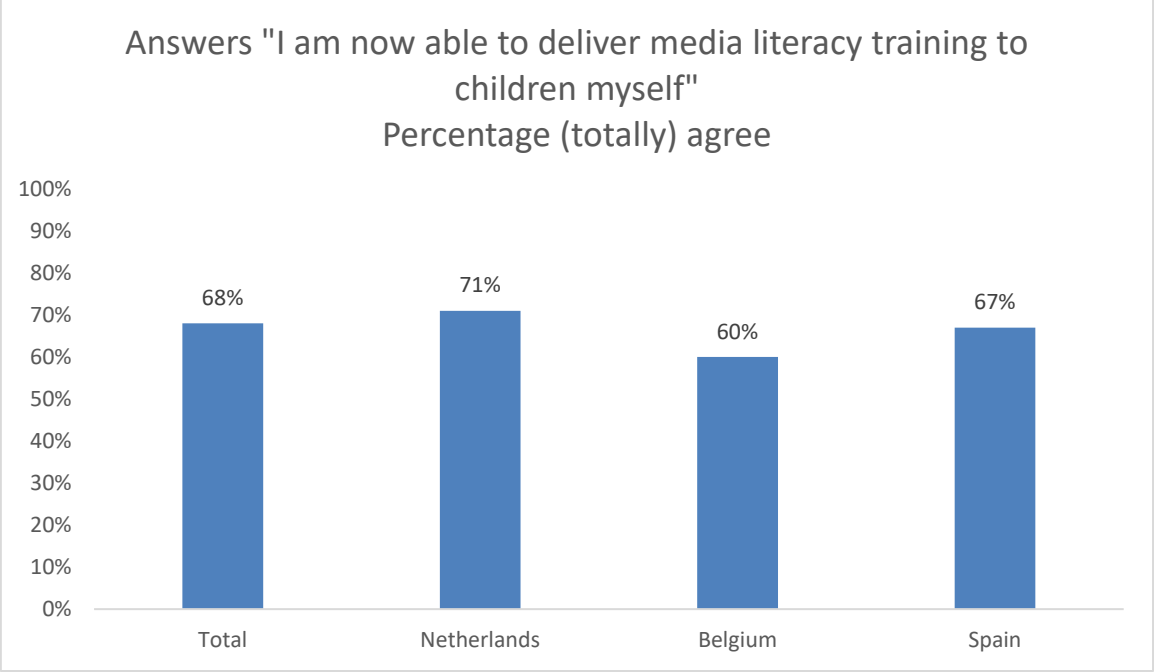

Chart 5 Answers "I am now able to deliver media literacy training to children myself"

4.3 Qualitative results

As mentioned earlier, the methodology of this research project was initially designed from a quantitative approach only. As the project progressed, especially in the last nine months prior to its completion on 30 April 2023, the researchers decided to also collect qualitative data from the trainers from the Netherlands, Belgium and Spain. There were three reasons for this:

1. The schools had indicated that they would not be ready to complete the knowledge tests until 17 February 2023 at the latest after the lessons. Analysing the quantitative data could therefore start late.
2. When completing the 'advance knowledge test', the link had inadvertently failed to be sent to a group of physical participants of the train-the-trainer workshops in Belgium, leaving only an online group to complete this knowledge test. Due to this and the reasons mentioned above, the researchers were concerned that the quantitative data might not provide enough representative material to answer the research questions.
3. The consortium partners who had provided training to the teaching pairs gradually came up with more and more verbal and written feedback that proved valuable to describe in the present report. So it was decided to pay attention to qualitatively collected data as well.

The qualitative feedbacks from the Dutch, Belgian and Spanish teachers and library professionals were collected in four small datasets:

I. Written open-ended questions to trainers in the knowledge test after the train-the-trainer workshops.

II. A focus group interview via an online meeting in MS Teams with ten Dutch pairs, covering their experiences of implementing and teaching the five building blocks. This meeting was recorded and the main findings were summarised anonymously by the researchers.

III. A jointly tabulated feedback log maintained by all three countries in which all feedback was collected: comments on the building blocks, the manual, et cetera. The feedback came from interviews with teachers, library professionals and consortium partners who had conducted the train-the-trainer workshops.

IV. A separately sent 'feedback survey' with five short open-ended questions in Dutch (for the Dutch and Belgian trainers) and in Spanish (for the Spanish trainers).

Dataset I - Written open-ended questions to teaching trainers in the knowledge test following the train-the-trainer workshops
Question 28: What did you like about the training?
We provide a clustered summary of the responses here:

- The training raises awareness on the subject: I look at news stories differently and am less likely to make judgements.
- The training contains diverse and interesting information about disinformation, the content of disinformation, and how disinformation campaigns are created; it gives numerous eye-openers; the building blocks are fun.
- The explanations were clear so we could work on the lessons ourselves.
- The dialogue (engaging with each other during the training) was very valuable and there was plenty of room for personal input.
- In terms of content, the five building blocks are very strong.

- The atmosphere during the training sessions was very pleasant.
- Discussing all the building blocks gave a clear helicopter view of the material.
- The trainers of the pairs (provided by the consortium partners) were very enthusiastic and inspired, also our input was appreciated and included in the adaptations.

Question 29: In what area(s) do you think the training could be improved?
We provide a clustered summary of the responses here:

- Building block B's game does not suit my target audience (vmbo and low-literacy).
- I felt the lessons were not yet finished, perhaps more pre-work could have been done.
- The content of the building blocks should include more national examples and thus fewer foreign examples.
- The material is not suitable/applicable for/at all levels.
- The time we have to implement the pilot is too short.
- The approach is too 'intellectualistic', in other words 'too abstract for children'.
- I found two days of training very long: I think I could have taught the lessons myself with a clear introductory video.

Question 30: What could we do to help you take ownership of the training content even better?
We provide a clustered summary of the responses here:

- The game from building block B had not been played by most before training.
- Getting teachers to participate in thinking about the content and delivery of lessons.
- Facts and basic information should be added so that every teacher can deliver the lesson and training.
- If you missed the first part of the train-the-trainer workshop, it would be nice to get a summary of what has already been covered during the second workshop.
- Shorter sentences, easier language, consideration of busy pictures and simplification.
- Making a difference with examples between the basic vocational course of vmbo and havo/vwo.

Question 31: To what extent do you agree with this statement "I am now able to deliver media literacy training on disinformation to young people myself".

- The answers to this question are discussed in the quantitative results, see section 4.2.

Dataset II - A focus group interview via an online meeting in MS Teams with ten Dutch pairs
On 31 January 2023, an online feedback session was organised by the KB with the aim of evaluating the pilot by some Dutch pairs (teachers and library professionals). Ten professionals from schools (vmbo, mavo, havo and vwo) and libraries shared their experiences with the KB and the two researchers (the latter are also the authors of the present report) on the training, implementation and delivery of the five building blocks of SMILES. Video recordings were made with the consent of the participants. The KB chairperson first gave a brief retrospective in which she said that:

1. 10 pairs indicated by summer 2022 that they wanted to start SMILES in the new school year.
2. 10 pairs attended SMILES' two-day train-the-trainer workshops in September and October 2022.

3. 10 pairs started the pilot in October 2022 or later in the autumn.
4. 8 pairs could actually start, 1 pair could start recently and 1 pair is still in discussion if and when they can start.
5. There were two interim contacts with consortium partners of SMILES.
6. Experiences were shared by e-mail.

This was followed by a round of introductions. Everyone then took turns to speak and the KB asked them to look back on their participation in SMILES with these questions in mind:

1. What was the pair's approach in the school in question?
2. For which group of pupils: education type and grade?
3. How many students were in the classes?
4. What went well?
5. What went less well?
6. What recommendation do you have for us?
7. Is a follow-up planned at the schools to continue with the SMILES building blocks?

In the full transcript of the joint interview session below, some participants occasionally mentioned specific technical bumps such as PowerPoints not working. Such 'problems' have since been remedied by the consortium partners. Furthermore, based on the feedback, the building blocks have also since been adapted, e.g. simplifying the language and shortening Building block B.

The main findings are:

- **Participant 1** (a library professional) reported that he did not know he could participate until very late: before summer 2022. As a result, SMILES' schedule for schools to complete five building blocks between September and December 2022 was too tight. He recommends that schools start early in the spring. His participation in the project unfortunately did not work out. Although his contact, a school, had attended the trainings, he withdrew before the start. After that, he was busy contacting other schools. Recently, he had found another school willing to participate in SMILES, but apart from an introductory meeting, no concrete promises and agreements have yet been made. However, even if this school were to participate, the research results of the knowledge tests would not come in time for the researchers. This participant also expressed a desire to provide feedback on the building blocks from the things he had noticed during the train-the-trainer workshop. For building blocks B and C, he would recommend taking another look at the design and structure. He also wondered whether a physical assignment such as 'cut and paste' was a good fit with the target groups. He was curious about the experiences of the other trainers, including on this point.
- **Participants 2** (a digital literacy specialist at a school) **and 3** (a library professional) also indicated that scheduling the SMILES building blocks in the class schedule was too tight for them. Fortunately, the necessary extension had been granted until mid-February 2023. Especially since the teacher of the pair indicated 'no regular classes'. Certain regular classes scheduled by the school had to be deliberately dropped to make room for the SMILES building blocks. Moreover, it took a lot of help from the school's timetabling team to help create this space. The building blocks were offered over two days with blocks within lessons. The pilot was conducted twice: once with a mavo class and once with a havo/vwo class. The mavo pupils found the building blocks too difficult. They found both the language level of the lessons and the questions in the measurement too complicated. On the one hand, these pupils indicate that they are 'thrown to death' with the term *fake news*, which makes it of less interest to

them. On the other hand, they do not know the alternative terminology *disinformation* and perceive such words as too difficult. So this is the other extreme. Alongside the SMILES building blocks, a havo/vwo class followed up the project themselves: they planned a plot with the pairs to pull off a 1 April prank (in 2023) at their school on disinformation. In doing so, they also had the help of a journalist from a regional newspaper who was happy to join in to give advice on how best to go about it. The school management had some concerns about the effect of the prank, but gave permission anyway. This initiative had come about as a replacement for the cut-and-paste tasks around the amusement park from one of the building blocks - these were not considered as interesting by these students. Participants 2 and 3 gave the following recommendation: once you have had a good start to your lessons, where the pupils find the theme catchy, keep a database of examples for the target group from then on. Do not think of boring examples like ministers, but rather influencers selling e-commerce.

- **Participant 3** also indicated later in the interview that they had to skip things or go through them faster, because as a teacher/library professional, you also spend a lot of time explaining the project, the knowledge tests, and the language (explaining difficult words) to students.

- **Participant 4** (a library professional specialising in media and with no teaching experience) taught the SMILES building blocks to a havo-1 class of 30 students, with support from the school. The lessons were scheduled during activity week, and then all in one day. This proved far too intensive for both the library professional himself and the pupils. However, the pupils participated well; the material landed well. In terms of content, they found it interesting. It was sometimes difficult to keep their attention with 30 mobile phones in the classroom. This participant has three recommendations. The first recommendation is that students create fake profiles (one of the assignments from the building blocks, which he did not offer digitally but with printed material) at the beginning of the lesson series. That way, the students would hold their interest better. In fact, the students totally flourished at this part and it is a nice unctuous start to the series of building blocks. Moreover, a funny side effect of working with the fake profiles was that the library professional - who did not know the pupils' names - did manage to quickly remember the fake names. All in all, this assignment had a positive impact on discussing the content on disinformation. Overall, his experience was that the goal of participating in SMILES was achieved: the students became more aware of the techniques behind disinformation and they started thinking more deeply about disinformation. A second recommendation is related to this: one building block includes an example of how students can tell from a photo when it is fake ('eyes aligned'). These kinds of techniques - from individuals who deliberately use certain technologies to spread disinformation into the world - will of course be obsolete in a few years' time. So it is important that SMILES' building blocks are updated from time to time. Finally, the school this library professional worked with is enthusiastic about continuing with the SMILES building blocks in the coming years. The tip (or third recommendation) to other schools that are also planning to do this is to then do to spread the building blocks over several teaching days.

- **Participant 5** (a school media officer at a vmbo school working with iPads) did not start until after the autumn break and therefore could not complete the building blocks in time. They could not start earlier than that, as the train-the-trainer workshop was completed just before the autumn break. She offered the building blocks to two classes of first-year vmbo students in the media literacy subject. There were about 26 students in each class. Lessons of 50 minutes are in fact too short to cover a building block; net you only have 40 minutes left as a teacher (students have to enter the room, unpack their bags, start, pack their bags again, leave the room, etc.). The students did not really understand what it was about and found the lesson material difficult. They needed more discussion and explanation than the time allowed for the building blocks. Again, some things these students liked, such as the quiz. Her own experience at the train-the-trainer workshop was that she struggled with the slide containing pictures with news items. She had expected this to be too difficult for her students, but to her own surprise, they could actually handle it. Looking back, it was a fun experience, but this teacher has no idea

what her students learned from it, and whether they will be able to use it later. She thinks "some students did, others didn't". She would like to test these building blocks again, but in second-year classes. She would then not cover the material in its entirety, because the scope is too big for the time available, and take out pieces (although she does not know exactly which ones at the moment, because everything does fit together nicely). Her recommendations for mavo students, for example, is: shorten the programme and take out pieces. Other recommendations: be aware that not all videos and quizzes work on iPads. Also make sure the language is adapted for these target groups: many terms are too difficult. Also, in the knowledge tests, pupils did not understand that the word 'mavo pupil' referred to themselves, i.e. vmbo-t'ers.

- **Participant 6** (media teacher at an iPad school for havo/vwo pupils) implemented the building blocks in two havo-3 classes, together with a colleague. She has mixed feelings about the project. Offering the SMILES building blocks between autumn and Christmas (November and December 2022) proved to be far too stressful for the pupils as there was too much material for one lesson, which in their school consists of only 45 minutes. At the end of the project, teachers deliberately skipped items, purely because of time constraints. Building block E could therefore not even be carried out at all. However, a summary of this was given to the students. However, the students were interested and willing to participate. This was beyond expectation for the teachers, given that "this was havo-3, a difficult target group". The students were amazed at the amount of disinformation coming our way. They found cutting and pasting fun to do, precisely because they are always on the iPad. The assignment with the fake profiles also struck a chord. However, one of the building blocks deals with a work form with an amusement park and, according to the pupils, this would be better replaced by other topics such as climate change, discrimination, animal suffering and vandalism. In general, this media teacher's recommendation is: rather let pupils choose such serious topics themselves. A second recommendation is to thicken the whole programme and/or spread it over several grades. Indeed, with this format, pupils soon showed a 'saturated feeling' regarding the topic of disinformation. A third point is that the technology (PowerPoints) did not always work well, as was the case at the other iPad school. Finally, this professional's school is considering continuing the project next year, but this is not yet certain. The decision depends mainly on whether time can be freed up in the curriculum and on the timetable.

- **Participant 7** (joined later during the interview; working at vmbo) indicated during the online session that she was still working on the series of building blocks. She was only halfway through at the end of January 2023. They could not manage to complete everything in the autumn. It involved a vmbo-t bridge class and a second-year class of basic vocational education. Each week she taught one building block. This worked fine, if she briefly repeated the previous week's material at the beginning of each new lesson. Both target groups find the building blocks far too difficult, this is especially true for the students of the basic vocational class. For this reason, the professional is considering not finishing the building blocks with them. The first-year vmbo-t class needed a lot of explanation, but, as mentioned above, the teaching went better with them than with the basic vocational class. They especially want assignments where they are allowed to 'click' a lot on their mobile phones. With the vmbo-t bridge class, she decided to take out the game and building block A was divided over two lessons. At the end of the second lesson, there was some space left and a work form (creating a fake account) was added from the website slechtnieuws.nl. Her recommendations are specifically about the basic vocational pupils, as this target group would benefit from this topic. The lessons would fit better if the building blocks were condensed, simpler language was used and the students were activated even more (a quiz with a and b answers is not interactive enough for this target group). Finally, she indicated that she would actively look for a havo/vwo class to run the building blocks with, as this would yield different experiences. Like other professionals, she says she finds it difficult to keep the SMILES building blocks up to date(but necessary). Content-wise, these are well put together, according to her.

- **Participant 8** (a media teacher from a havo/vwo school) indicated that his intention was to participate, but little has happened yet due to logistical and practical problems in scheduling the building blocks. This is due to the school's new flexi timetables. These involve 80-minute classes plus free space components. He thinks the SMILES building blocks will do best with a 4/5 havo profile. He hopes to start the series of lessons next year as yet.
- **Participant 9** (language and media consultant at a library, culture and arts centre) worked with a teacher from a school with autistic pupils. The building blocks were distributed in three 2-havo classes, with about 10-12 students per class. Such pupils need clear communication about content, how numbers are arrived at, and they need a strong link between theory and practice. For the latter reason, the following format was chosen: one week of theory and one week of practice. Unfortunately, this planning went awry because of teacher and student illness, followed by test weeks and the like. The analytical part went easily for the students, this was clear to them. In this, they do need assignments that are not too open-ended, because then they lack imagination. The order of the five building blocks was adjusted here and there. For pupils with Autism Spectrum Disorder (ASD), things can be black and white. As a teacher, it is therefore important to offer the (SMILES) material in the right order. The building blocks had yet to be completed at the time of the online session. Despite this, the pilot did affect the students. The recommendations are to always link theory to practice, as well as to spread the teaching material over year 2 and 3.
- **Participant 10** (library professional) together with a teacher had two vmbo primary classes (freshmen, about 50 students). The SMILES building blocks were embedded in the media literacy subject. The pupils found the teaching material difficult. However, they constantly came up with topics themselves. They liked the cut-and-paste assignment. The example with the amusement park was too abstract. According to the professionals, the game was too difficult and "they didn't even try it". Many words were too difficult, many things had to be simplified and prefaced. Some lessons were shortened and skipped. In general, the professionals experienced that students found it difficult to understand the historical context of any of the building blocks and to "engage in conversation". What did not cooperate with this was the location: this was a computer lab. He does not recommend this to anyone, as it distracts students too much. Also, the teaching hours were too short for completing the five building blocks: they had to/could spend seven lessons on it, and even then they still hadn't gone through the material. His school does plan to continue working with the building blocks. His recommendation in doing so is: shorten the building blocks and rearrange certain things.

The above responses were collected among trainers from the Netherlands. To also collect experiences from the other countries, the previous focus group interview was presented to the partners in Belgium (MLA) and Spain (Fundación Platoniq) and they were asked if they recognised the Dutch context. The Belgian and Spanish consortium partners said they recognised this feedback collected under the heading of qualitative data. They believe that the profile of the selected teaching pairs was good; that they were well equipped to implement the project and building blocks. In Belgium, they also experienced difficulties in planning the activities: the timeline of SMILES was too short for efficient implementation in the schools.

In Belgium and Spain, as in the Netherlands, the issue with the difficulty of the terminologies and language use within the teaching building blocks themselves played a role: MLA believes "our target group was too broad". Furthermore, this partner indicated that the suggestions of one of the Dutch interviewees, to do one week of theory and one week of practice (referring to the SMILES building blocks), was an interesting option. In both Belgium and Spain, the main problem lay in forming pairs between teachers and library professionals, because, as mentioned earlier, this collaboration is best embedded in the Netherlands because of institutional grounds.

Based on the feedback, the Belgian consortium partner MLA concludes that "most teachers and library professionals were very enthusiastic about the materials - but each class and group is indeed very

different (level, attention, structure, location of the class) so the actual implementation of such a project needs extra attention."

Dataset III - A tabulated feedback log maintained jointly by all three countries
Between September 2022 and January 2023, the consortium partners continuously collected feedback from the teaching pairs (teachers and library professionals) to identify which things went well and which less so. This includes both the experiences during the train-the-trainer workshops and delivering the lessons to students. The table lists 'recommendations and possible solutions'. These are discussed in section 5.2.

Dataset IV - A separately submitted 'feedback survey' with five short open-ended questions
Educators and library professionals were asked five more open-ended questions in early 2023. Below the questions, responses are shown in clustered form:

1. In general, what was your experience of teaching the SMILES building blocks?

- The pairs report that they enjoyed doing it immensely.
- The curriculum is laid out in a playful and effective way.
- The project and lesson content are perceived as very interesting. Pairs enjoy working with the topic of disinformation using five ready-made building blocks.

2. What did you like about the SMILES building blocks?

- The topics covered are considered very informative and useful.
- The content of the building blocks was well designed and gave a clear framework to work with.
- The structure of the building blocks is sound.
- The structure of the building blocks is pleasant.
- The topic of disinformation is very relevant and fits well with current events.
- The building blocks are rich in information.

3. In what ways could the SMILES building blocks be improved?

- To avoid duplication and increase the readability of the present report, the answers to this question are included in section 5.2 as recommendations.

4. How did the students react after attending the SMILES building blocks?

- Students were generally very positive about the building blocks.
- There is a lot of enthusiasm to work on the topic of disinformation.
- The balance between information and being nice and active with the building blocks was good.
- Students indicated that they found the topic of disinformation very interesting and showed genuine interest while following the building blocks.
- Students enjoyed coming up with their own relevant examples during lessons.

5. If you plan to integrate (parts of) the SMILES workshop building blocks into the current curriculum, which parts are involved?

- The parts where the students get to work on their own.
- Components that fit well with citizenship education.

- The sections that clearly address the difference between information and disinformation are very useful.
- Parts where theory and practice can be integrated in one lesson.
- Parts we can develop into short assignments and a final assignment.
- Items we can use to create a learning line.
- Link the different techniques available for creating and disseminating disinformation to a practical task.

The survey also contained a final closed-ended question:

6. How likely are you to collaborate more often with the (local) library on digital media in the future, including countering disinformation?

- Of the seven respondents, three people answered 'neutral', two people 'likely' and two others 'very likely'.

4.4 Conclusion

Conclusion quantitative data
As described, the quantitative part of the study consists of two knowledge tests that were presented prior to attending the workshops/lessons and afterwards. The knowledge test for students contained statements that they had to rate as true/false. A final score was calculated for each pupil based on the number of correctly answered statements. On average, European pupils scored 12.8 points before the lessons and 12.3 points after the lessons. There are no significant differences between the scores from different countries. This allows us to conclude that no significant effect can be identified from the effect measurement by means of the knowledge tests among pupils. But in the knowledge test that was submitted to the students afterwards, a number of open questions were asked to find out what students thought of the lessons and whether they felt they had learned more. These questions show that almost half of the pupils say they learned a lot of new things and four out of ten pupils say they will put what they learned into practice. Over half of the pupils think they are now able to tell the difference between disinformation and reliable news. From these figures, it seems that a learning effect did occur, but was not measured by the knowledge tests used. We will explain more about the limitations of the quantitative method used in Chapter 5.

The knowledge tests for trainers also contained statements that the teachers and library professionals had to answer true/false. On average, the European trainers scored 10.6 points in the pre-training knowledge test and 11.8 points in the post-training knowledge test. Thus, the score afterwards is slightly higher, but this difference is not significant. The analysis of trainers' scores also shows that there are no significant differences between the scores of trainers coming from different countries. What is a positive outcome is that after attending the train-the-trainer workshops, the majority of trainers say they feel able to give media literacy training on disinformation to young people themselves. In the Netherlands, 71% agree (completely) with this statement, in Belgium 60% and in Spain 67% agree. This does achieve the aim of the train-the-trainer workshops, which is to prepare trainers to deliver the lessons.

Conclusion qualitative data
The analysis of the four mini-datasets show two things:

1. The extent to which trainers were satisfied with attending the train-the-trainer workshops, what they learnt there and how they estimate their students will find the building blocks.

The trainers especially liked the training that it encouraged awareness of the topic; it was very informative; the explanations were clear; there was plenty of room for dialogue; the building blocks were strongly structured; the atmosphere during the training was pleasant; there was a clear helicopter view; and the trainers were very enthusiastic and inspired.

According to the trainers, the training could be improved by making it less intellectualistic and shorter. Possibly a training video could help. Also, more attention should be paid during training sessions to the fact that the SMILES building blocks (because of, for instance, the use of language) are not suitable or easy to grasp for all target groups (such as vmbo and low-literate). This also applies to the game from building block B.

The content of the trainings could be better internalised by trainers by allowing them to think about the content and delivery of the lessons themselves; if they could have played the game from building block B beforehand in preparation for the training; more facts and basic information about disinformation and journalism would be added, so that trainers could not only give the lessons to the students, but also train their colleagues to deliver the lessons; a summary of the first training day; and they would see a more clearly applied difference between the examples suitable for the basic vocational training of vmbo versus havo/vwo.

2. Trainers' experiences of teaching the lessons from the building blocks.

From the feedback collected among Dutch trainers, the following issues emerged in outline:

- The trainers found it fun and instructive to teach the building blocks. They felt the building blocks were well put together and logically laid out.
- Trainers like the fact that there is a ready-made teaching package, which they can adapt themselves if necessary.
- The topic of disinformation is very relevant and fits well with current events.
- Students generally participated well and seemed to learn from the building blocks.
- The planning of the pilot did not work out well for the participating schools.
- The building blocks are not suitable for mavo students. The havo/vwo pupils, however, were enthusiastic.
- Teachers spend a lot of time explaining the project, knowledge tests, and language. Therefore, the building blocks are too long for one class hour and are better spread over several hours.

This feedback was presented to the Belgian partners and they indicated that they recognised this feedback from the focus interviews done in Belgium. During the Transnational Project Meetings, Spanish partners indicated that they received similar feedback.

5 In conclusion

In this chapter, we conclude with a conclusion and reflection (section 5.1), and recommendations (section 5.2). In section 5.1, we additionally answer the research questions. We look back at the main research findings and hope to inspire readers who also want to get started with the five building blocks (or own teaching materials to recognise and combat disinformation) how best to do so.

5.1 Conclusion and reflection

Answering the research questions

1. To what extent did the project succeed in establishing a strategic partnership to test common innovative teaching methods in the field of (digital) media literacy aimed at library professionals and educators, as well as schoolchildren aged 12-15?

    - The consortium partners succeeded in establishing a strategic partnership. There was good cooperation between them and the experiences of the different partners were positive. The alternation between physical and online meetings created a sense of unity and shared goals and responsibilities.

    - The consortium partners jointly developed five innovative building blocks that were then used by trainers (teaching pairs) to teach young people in secondary schools to use digital technologies more safely and responsibly with a focus on recognising reliable and authentic information versus disinformation.

2. To what extent did the consortium partners succeed in providing practical guidance and training to teachers and library professionals on disinformation, teaching them new skills for organising (digital) media literacy lessons for secondary school students?

    - All consortium partners offered disinformation training to teachers and library professionals in their countries.

    - In the application, the plan was to train 10 teachers and 10 librarians per national partner to deliver the building blocks. This proved difficult to achieve in practice. Nor was a two-day training organised in every country: in some countries, the training took place partly digitally. Besides the training sessions, a handbook was also available for the trainers in which all building blocks were clearly explained. All participants at the training days were very positive about the training and felt confident afterwards to be able to work well with the building blocks themselves.

    - The consortium partners completed the train-the-trainer workshops in different ways. Belgium organised both a physical, and an online workshop. At the online workshop, 10 professionals attended. The physical training had 20 participants, with different functions, such as youth workers, teachers and librarians. A physical train-the-trainer workshop took place in the Netherlands, lasting 2 working days. A total of 20 future teaching professionals attended. In Spain, three train-the-trainer workshops were organised with a total of 16, 13 and 6 participants, respectively.

    - The majority of trainers say after attending the train-the-trainer workshops that they feel they are able to deliver media literacy training on disinformation to young people themselves. In the Netherlands, 71% agree (completely) with this statement, in Belgium 60% and in Spain 67% agree.

- All trainers who participated in the pilot say they will continue with the building blocks. This is a very positive result and indicates that the project has succeeded in providing teaching materials in this area.

3. To what extent have young people in secondary schools in three European countries been helped to use digital technologies more safely and responsibly with a focus on recognising reliable and authentic information versus disinformation?

   - The qualitative results show that pupils found the building blocks interesting and that the SMILES lessons were a starting point for discussion, further activities and deepening. The quantitative analysis also shows that over 40% of pupils enjoyed participating in the building blocks. Around 40-50% of pupils say they will apply what they have learned in practice. A quarter of pupils in the Netherlands and Belgium say they would like to learn more about the topic of disinformation; in Spain the figure is as high as 35%.

   - The plan was for 10 schools per country to participate in the SMILES project, reaching a total of 600 schoolchildren. The number of schools was not achieved in each country. A total of 20 schools participated in the SMILES project (8 in the Netherlands, 9 in Spain and 3 in Belgium). Nevertheless, an estimated total of 570 pupils were reached, which is about the same as originally conceived (365 pupils in the Netherlands, 130 pupils in Spain and 75 pupils in Belgium).

   - The SMILES building blocks were a good addition to existing teaching materials that pay little attention to disinformation. There is also still little attention to this in media literacy subjects.

4. To what extent are the implemented building blocks effective, as evidenced by evaluations through impact measurement?

   - The effect measurement measured the extent to which the train-the-trainer workshops among teachers and library professionals, and the building blocks among students, had a positive effect on the extent to which trainers and students correctly answered the statements from the knowledge test. No significant improvements on the final score obtained emerged from the quantitative analysis. The lack of these effects may also be caused by the fact that the impact measurement method was not appropriate for the project (see heading stumbling blocks and challenges). For instance, the knowledge tests did not match well with the content of the building blocks, knowledge tests were too long and the results of both knowledge tests could not be linked at an individual level. But the self-assessment component of the knowledge tests did show a positive learning curve. Moreover, the qualitative results of the study also show that the implemented lessons have positive effects. The analysis of the ex-post effect measurement shows that pupils do feel able to tell the difference between disinformation and reliable news after the building blocks. In the Netherlands, 55% of pupils say so, in Belgium 63% and in Spain 44%. Students also often feel they have learned new things in the building blocks; 50% agree with this statement in the Netherlands, 42% in Belgium and 44% in Spain. This is a very positive result.

   - The qualitative results of the study also show that the implemented lessons have positive effects. Teachers indicate that students were interested in the teaching materials and felt that students gained knowledge around the topic. Teachers indicate that the content of the building blocks is well put together and that the building blocks fit together well.

5. To what extent have existing and new collaborations between schools and libraries in the three partner countries been strengthened?

   - Only in the Netherlands has the linkage really succeeded, this is because of the pre-existing institutionalised embedding in which schools already frequently cooperate with libraries (and

also: because schools often employ their own media librarians). This is a focus for the other countries. It turned out that it was difficult in Spain and Belgium to get libraries and schools to work together, because that relationship is not obvious there. In the Netherlands, there is a lot of cooperation between libraries and schools, but this did not appear to be the case in all Dutch regions, by the way.

- One of the aims of the project was to establish/promote cooperation between libraries and secondary schools. It was therefore chosen to work with a pair consisting of a library professional and a teacher. The evaluation with the participants showed that SMILES had a positive impact on such cooperation (trainers found it fun, inspiring and instructive), but that working together with education requires more than an occasional project. When it comes to good structural cooperation, good preparation and structural commitment of both someone from the library and the school is necessary, and that requires formation. One preparation school year and one subsequent implementation school year seem almost necessary to achieve success. In this respect, SMILES was planned too tightly at the outset. Fortunately, Erasmus+ honoured a run-out so that the schools that were still busy could finish their building blocks. The Digital Toolkit contains tips on how to work well together. Not entirely unimportant to mention is also that the materials were adapted based on the feedback, both the building blocks, manual and Digital Toolkit.

Obstacles and challenges

Research: knowledge tests etc.

On reflection, the quantitative component of the study, the knowledge tests, does not fit well with the project. The time between completing both knowledge tests is too short to measure really significant results. In addition, the knowledge tests were very long and the language was too complicated for some respondents. Feedback from teachers showed that many of the students (especially the vmbo students in the Netherlands) did not understand the knowledge tests. Taking the knowledge tests took a lot of time due to their length. This activity had to take place within the relevant lesson hour itself, while teachers indicated that they were already pressed for time when teaching the building blocks. For these two reasons, it is likely that the knowledge tests were not completed very seriously, especially by the students.

Another problem with the method used is that the content of the knowledge tests does not fit well with the topics covered in the five building blocks. The examples used in the knowledge tests are different from those used in the building blocks. The knowledge tested in the knowledge tests has not been covered in full verbatim (or: one-to-one) in the building blocks. As a result, according to the researchers, the knowledge tests do not properly measure whether a significant learning effect has occurred. However, the evaluation questions asked in the knowledge test after following the train-the-trainer workshops and lessons show that both the trainers and the students themselves do feel they have learned something.

Regarding the content of some questions/positions from the knowledge test, the researchers note in retrospect that there are normative views (e.g. about a sexy photo being circulated in an app group). The question is whether you can change students' ethical compass with a few building blocks. Moreover: even if you are an expert on disinformation, you can agree with such a statement, i.e. that you have no problem with someone sending around a sexy photo in an app group.

In addition, a number of practical problems and obstacles existed with regard to the quantitative part of the survey. As it was very cumbersome and often not possible under the GDPR to ask for personal data such as an e-mail address, it was not possible to link completed knowledge tests to a specific respondent. It was therefore decided to try to link the pre-knowledge test and the post-knowledge test by a roundabout means. Control questions were asked, which did not contain personal data, but together contained a code unique to the respondent. Unfortunately, it turned out that either not the

same individuals completed both knowledge tests, or respondents answered the control questions differently. As a result, the results could not be analysed at the individual level.

There were also some problems with sending out the digital links to the knowledge tests. Because the project was set up so that the researchers had no direct contact with the students and trainers, they were dependent on various chain partners (and they in turn on their own contact persons) for sending out the digital links to the knowledge tests. This resulted in a disappointing response rate and a number of problems with incorrect or forgotten links sent out with a link to the knowledge tests. Also, the fact that there were 12 different knowledge tests and thus digital links caused confusion and mistakes in sending out the links. When analysing the data, these 12 different datasets also created a lot of extra work.

Finally; the trainers had the same knowledge tests as the students. In retrospect, this was not very fortunate because we were measuring something different in both target groups. Namely: with the teachers and library professionals, we wanted to know the learning effect after attending the two-day train-the-trainers workshops; while with the learners, we wanted to know the learning effect after attending the five building blocks.

Project: practical implementation, materials, etc.
As mentioned earlier, some trainers sometimes suffered from some technical 'hurdles' in lesson preparation or during teaching. Think of a PowerPoint that could be adapted, but then could not be saved properly. Such technical problems were continuously collected by the consortium partners throughout the project in the three countries and soon provided with solutions. For this reason, we will not pay more attention to them here. In addition, the schools, teachers and library professionals experienced other types of bumps in implementing and delivering the SMILES lessons. These issues are described in the next section in the form of how they can be solved in a constructive way, i.e. as recommendations.

5.2 Recommendations

Several recommendations have already emerged here and there in the present research report. We present here an overview arranged by theme, which may be useful for future users of the SMILES building blocks.

Implementation & timing

- The content of the five building blocks contains a logical structure and order. Therefore, offer the building blocks in the correct order.
- Some teachers themselves experience a knowledge gap on the topics of journalism and disinformation. It is then important to schedule extra reading time on these topics. It is still possible, even after the project ends, to attend train-the-trainer workshops on request. In the Netherlands, these are provided by the Netherlands Institute for Sound and Vision for both Belgian and Dutch participants, and in Spain by an umbrella organisation of libraries.
- Some teachers and library professionals have found it time-consuming to translate the five building blocks designed by SMILES into classroom practice (with regard to didactic, theoretical, learning objectives and testing). Extra preparation time is therefore welcome.
- The building blocks appear to be slightly too long for one class hour. Taking into account: a) the time lost with students entering and leaving, b) the time needed for the teacher or library

professional to explain and clarify the material and c) the extra time needed for discussion, we recommend scheduling more than one class hour for a building block.

- It is also advisable to spread the building blocks throughout the year, so that the teaching material can sink in better and saturation of the subject matter does not occur among pupils within a short period of time. Also, the programme (the whole of the five building blocks) could be spread over several teaching years.
- For very young pupils aged 11-12 years old (such as first-year and bridge class pupils), the SMILES building blocks can be a bit more difficult to follow. Participants who delivered the building blocks therefore recommend offering the teaching material in year 2 or 3. Another solution could be to offer the teaching material at the end of the year for this group of students.
- If pupils find the explanations and answers linguistically too difficult, it undermines the learning effect. The building blocks have proved difficult for vmbo students, basic vocational students and students in the first year of secondary school. Offering the SMILES building blocks is possible in such cases, but then it is necessary to: a) adapt the terminology, b) take more time, c) and make the lessons more interactive with assignments and games (a quiz with A and B answers is in fact not interactive enough). The language in the building blocks has since been adjusted in the final phase of the project based on this feedback.
- Think carefully in advance about planning and the most efficient teaching period in which to teach the SMILES building blocks: which teaching period works best (the months before the summer holidays or the period of autumn and early winter)? Consider such considerations as: when do test weeks take place? When are there mid-term holidays? When are students usually felled by the flu? Spring and early summer may be more suitable than autumn.
- Choose a location suitable for delivering the building blocks and check whether the arrangement of tables and chairs is suitable for discussion (computer lab, for example, is too distracting and not suitable for this type of teaching).
- Disinformation is a sensitive issue. Allow enough time for discussion, dialogue, debate and the exchange of ideas and personal experiences.

Adapting teaching materials

- During the trainings, the SMILES consortium partners who conducted the train-the-trainer workshops indicated that trainers are free to adapt the five building blocks as they see fit. In practice, however, not all participants have the right knowledge to do this. Therefore, look carefully in advance to see which parts can be shortened, spread out and modified rather than doing this ad hoc once the lesson series has already started.
- As a teacher or library professional, in addition to the SMILES material, look for examples yourself that appeal to pupils. Here, the principle of 'proximity' (connecting to the pupils' world of experience) is crucial in order to promote empathy with the subject.
- It can be useful to create a database of appealing examples that can be reused. However, some examples that refer to current digital techniques and technologies may quickly become obsolete within a few years. Consider an AI-generated photo that is 'fake' because if you look closely, the eyes are too aligned. So it is advisable to use updates of such teaching materials or teach these examples as 'recent historical examples'. Based on this feedback, the Digital Toolkit includes resources where recent examples of disinformation can be found.
- Pupils also like to come up with their own examples: in fact, they would rather discuss an influencer than a minister featured in the building blocks. Pupils also seem to enjoy discussing

current world problems in class; it is important to encourage this and make time and space for it in lessons.

- The aim of SMILES building blocks is to make students recognise disinformation and become more resilient. Some teaching materials, however, seem to convey a normative message themselves in terms of "what is true and what is not". For example, on climate change. So there are certain normative judgements embedded in the teaching material here and there (e.g. in building block B). Some teachers, library professionals or students may find this too directive. The question, of course, is whether it is at all possible to develop value-free teaching materials. In any case, make this negotiable in the classroom.
- Make the lessons even livelier by inviting a journalist into the classroom once.
- Students become even more actively involved in the lessons if there is room to organise extra activities outside the classroom, such as pulling a 1 April prank at school around the topic of disinformation.
- Complex games (as in building block B) require a walk-through instruction with a summary for teachers; and a worksheet for students to keep in their notebooks or digital notes. This instruction was added to the building block based on this feedback in the final phase of the project.
- Playing a complex game (as in building block B) is too complicated for vmbo students and students with *special needs*, especially for first-year students. They may also experience the game as too busy, too distracting and the next steps are not always perceived as easy to find. For some players, the interface is also not intuitive enough. Schedule more time for the game or look for other teaching materials related to these target groups. Based on this feedback, the game in building block B has been simplified and shortened.
- Building block C includes an assignment for students to create fake profiles. It works better to do this assignment at the beginning, so that attention is better held.
- As a teacher or library professional, give more direction to the historical casuistry (in building block E) by dividing time periods between a few or a group of students.
- Provide students with the websites/resources where they can find the historical examples (from building block E). Added these sources to the building block based on this feedback.
- The cut and paste task is particularly appreciated by students in iPad schools, as it takes them away from the screen and they find it fun to be able to do some 'old skool' crafting for a while.

Annex 1: Pre-lesson knowledge test for students from the Netherlands

This knowledge test has been developed as part of the SMILES project and the classes you will participate in. The knowledge test consists of a number of introductory questions and 25 statements. Please answer the questions and statements honestly. Your answers will be anonymous. The purpose of the survey is to evaluate the lessons. We expect it to take about 10 minutes to complete the knowledge test.
We have informed your parents/carers with a flyer about these SMILES lessons you will be participating in. Have you talked to your parents/carers about your participation in these classes? 0 Yes 0 No

This survey is anonymous and will take place before and after your participation in the SMILES project. In order to compare these two completed knowledge tests, we will give you a unique code. This code is based on the answers to the three questions we will ask you below. This way, the researchers do not need to know your name or other personal details and the study remains anonymous. What is your day of birth? Please enter your day of birth as 2 digits. If your day of birth consists of only 1 digit, start with 0. Example: if you were born on 5 December, enter 05. What are the first 2 letters of street you currently live in? What are the last 2 digits of your personal mobile phone number?
I am a... Boy Girl Otherwise I wouldn't say that
What is your age? <open>
What kind of education are you currently pursuing? VMBO HAVO VWO Combination class VMBO/HAVO Combination class HAVO/VWO Otherwise
What language(s) do you speak at home? Tick all that apply. Dutch/Flemish French English Moroccan Arabic/Berber Turkish Chinese/Mandarin

Polish Other, namely...

For the statements below, indicate whether you think they are true, false or that you don't know.
Each proposition has the choices Where Not true I don't know

Latent variable		Questions
Knowledge and understanding of how media are organised	KMO1 true/false	News about Covid-19 on the Youth News is always double-checked before it is aired.
	KMO2 true/false	If 10 different people look up the same words in Google, they all get the same search results. (reverse coded)
	KMO3 true/false	People posting on Twitter about the war in Ukraine always do extensive research first. (reverse coded)
	KMO4 true/false	Journalists help Facebook fact-check posts about Covid-19, but not all posts can be checked.
	KMO5 true/false	It is true that TikTok has removed unreliable information on Covid-19. However, there are still a lot of videos on TikTok that have not been checked.
Knowledge and understanding of media content types	KMC1 true/false	Reliable news organisations always post a correction if they have accidentally posted a wrong message.
	KMC2 true/false	Some posts on social media are meant to offend other people, for example politicians.
	KMC3 agree/disagree	I have nothing to hide, so I don't have to worry about my privacy either. (reverse coded)
	KMC4 true/false	Posting a picture on Snapchat does no harm, as it is deleted after 10 seconds anyway. (reverse coded)
	KMC5 true/false	When I have searched for mouthguards on Google, I subsequently come across ads for mouthguards on other websites. This is because Google sells my searches to other people.
Knowledge and understanding of media effects	KME1 agree/disagree	Someone whose sexy picture is sent around in an app group is to blame (reverse coded)
	KME2 agree/disagree	If a photo on Instagram has a lot of likes, it is also a great photo. (reverse coded)

	KME3 agree/disagree	Negative news gets more attention on social media than positive news.
	KME4 agree/disagree	Two people reading the same post on Covid-19 can still get very different information from it.
	KME5 agree/disagree	For them, most of the information people read on social media confirms the opinion they already have.

Personal media locus of control	LOC1 true/false	Before I forward a WhatsApp message, I always check that the content is correct.
	LOC2 true/false	I decide who I get to see information from on social media.
	LOC3 true/false	Personal data on my mobile phone
	LOC4 true/false	I know how to turn off push notifications or app notifications on my phone.
	LOC5 true/false	When I am asked to 'accept' cookies, I always click 'Accept All'. (reverse coded)
Content analysis and evaluation skills	SK1 agree/disagree	The message in this YouTube video is reliable: https://youtu.be/GT3pcfmNdX4 (reverse coded)
	SK2 agree/disagree	https://ukraine.ua/ is a reliable website to look up information about the war in Ukraine. (revers coded)
	SK3 agree/disagree	This report on the RTL News site about Covid-19 is reliable https://www.rtlnieuws.nl/entertainment/royalty/artikel/5113131/gezin-prins-laurent-getroffen-door-coronavirus For Flanders suggest using this message: Dutch Princess Beatrix (83) tests positive for coronavirus | Royalty | hln.be
	SK4 agree/disagree	This infographic contains reliable information about Covid-19 and water: Infographic
	SK5 agree/disagree	This video contains reliable information about Covid-19 https://fb.watch/4-QIgwlIFT/. (reverse coded)

Annex 2: Knowledge test prior to the train-the-trainer workshops for the trainers from the Netherlands

This knowledge test is part of the international disinformation project SMILES in which you are participating. The form consists of some introductory questions and 15 statements. We ask you to answer the statements and questions as honestly as possible. Your answers will be processed anonymously. The purpose of the knowledge test is solely to measure the effectiveness of the workshops. You will need about 5 minutes to answer all the questions.
☑ I have read the information about the study and I agree to participate.
This survey is anonymous and will take place before and after your participation in the SMILES project. In order to compare these two completed knowledge tests, we will give you a unique code. This code is based on the answers to the three questions we will ask you below. This way, the researchers do not need to know your name or other personal details and the study remains anonymous. What is your day of birth? Please enter your day of birth as 2 digits. If your day of birth consists of only 1 digit, start with 0. Example: if you were born on 5 December, enter 05. What are the first 2 letters of the street you currently live on? What are the last 2 digits of your personal mobile phone number?
Demographic items: I am a he, she, other What is your age? What is the highest education you have attended? Secondary education MBO Bachelor Master PhD/PhD Other What language(s) do you speak at home? (Tick all that apply) Dutch French English Moroccan Arabic/Berber Turkish Chinese/Mandarin Polish Other, namely...
How many years of experience do you have in teaching or training? <open>

Items in Dutch		
Of the statements below, please indicate whether you think they are true or false, or if you don't know.		
Where	Not true	I don't know

Latent variable		Items in Dutch

Knowledge and understanding of how the media is organised	KMO3 true/false	People who publish posts on Twitter about the war in Ukraine normally do extensive research first. (reverse coded)
	KMO4 true/false	Journalists help Facebook fact-check posts about Covid-19 but not all posts can be checked.
Knowledge and understanding of media content types	KMC2 true/false	Some posts on social media are meant to damage other people, for example politicians.
	KMC4 true/false	Posting a picture on Snapchat won't hurt because it will be deleted after 10 seconds anyway. (reverse coded)
Knowledge and understanding of media effects	KME2 true/false	If a Tweet (a message on Twitter) is often retweeted, it must also be trustworthy. (reverse coded)
	KME3 true/false	On social media, negative news gets more attention than positive news.
Personal media locus of control	LOC4 true/false	I know how to turn off push notifications or app notifications on my smartphone.

Of the statements below, please indicate whether you agree or disagree, or don't know.			
Agree	Agreed	Disagree	I don't know

Latent variable		Items in Dutch
Knowledge and understanding of media effects	KME1 agree/ disagree	Someone who is caught off guard by a Twitter storm (an unexpectedly large number of negative posts about him or herself) is to blame. (reverse coded)
	KME4 agree/ disagree	Two people reading the same post on Covid-19 can still get very different information from it.
	KME5 agree/ disagree	For them, most of the information people find on social media confirms the opinion they already have.
Content analysis and evaluation skills	SK1 agree/ disagree	The message in this YouTube video is reliable: https://youtu.be/GT3pcfmNdX4 (reverse coded)
	SK2 agree/ disagree	https://ukraine.ua/ is a reliable website to look up information about the war in Ukraine. (reverse coded)
Latent variable		Items in Dutch
Content analysis and evaluation skills	SK3 agree/	This report on the RTL News site about Covid-19 is reliable https://www.rtlnieuws.nl/entertainment/royalty/artikel

	disagree	/5113131/gezin-prins-laurent-getroffen-door-coronavirus
	SK4 agree/ disagree	This infographic contains reliable information about Covid-19 and water: Infographic
	SK5 agree/ disagree	This video contains reliable information about Covid-19 https://fb.watch/4-QIgwlIFT/. (reverse coded)

Annex 3: Post-lesson knowledge test for students from the Netherlands

This knowledge test has been developed as part of the SMILES project and the classes you will participate in. The knowledge test consists of a number of introductory questions and 25 statements. Please answer the questions and statements honestly. Your answers will be anonymous. The purpose of the survey is to evaluate the lessons. We expect it to take about 10 minutes to complete the knowledge test.
We have informed your parents/carers with a flyer about these SMILES classes you will be participating in. Have you talked to your parents/carers about your participation in these classes? 0 Yes 0 No

This survey is anonymous and will take place before and after your participation in the SMILES project. In order to compare these two completed knowledge tests, we will give you a unique code. This code is based on the answers to the three questions we will ask you below. This way, the researchers do not need to know your name or other personal details and the study remains anonymous. What is your day of birth? Please enter your day of birth as 2 digits. If your day of birth consists of only 1 digit, start with 0. Example: if you were born on 5 December, enter 05. What are the first 2 letters of street you currently live in? What are the last 2 digits of your personal mobile phone number?
I am a... Boy Girl Otherwise I wouldn't say that
What is your age? <open>
What kind of education are you currently pursuing? VMBO HAVO VWO Combination class VMBO/HAVO Combination class HAVO/VWO Otherwise
What language(s) do you speak at home? Tick all that apply. Dutch/Flemish French English Moroccan Arabic/Berber Turkish Chinese/Mandarin

Polish Other, namely...

For the statements below, indicate whether you think they are true, false or that you don't know.
Each proposition has the choices Where Not true I don't know

Latent variable		Questions
Knowledge and understanding of how media are organised	KMO1 true/false	News about Covid-19 on the Youth News is always double-checked before it is aired.
	KMO2 true/false	If 10 different people look up the same words in Google, they all get the same search results. (reverse coded)
	KMO3 true/false	People posting on Twitter about the war in Ukraine always do extensive research first. (reverse coded)
	KMO4 true/false	Journalists help Facebook fact-check posts about Covid-19, but not all posts can be checked.
	KMO5 true/false	It is true that TikTok has removed unreliable information on Covid-19. However, there are still a lot of videos on TikTok that have not been checked.
Knowledge and understanding of media content types	KMC1 true/false	Reliable news organisations always post a correction if they have accidentally posted a wrong message.
	KMC2 true/false	Some posts on social media are meant to offend other people, for example politicians.
	KMC3 agree/disagree	I have nothing to hide, so I don't have to worry about my privacy either. (reverse coded)
	KMC4 true/false	Posting a picture on Snapchat does no harm, as it is deleted after 10 seconds anyway. (reverse coded)
	KMC5 true/false	When I have searched for mouthguards on Google, I subsequently come across ads for mouthguards on other websites. This is because Google sells my searches to other people.
Knowledge and understanding of media effects	KME1 agree/disagree	Someone whose sexy picture is sent around in an app group is to blame (reverse coded)
	KME2 agree/disagree	If a photo on Instagram has a lot of likes, it is also a great photo. (reverse coded)

	KME3 agree/disagree	Negative news gets more attention on social media than positive news.
	KME4 agree/disagree	Two people reading the same post on Covid-19 can still get very different information from it.
	KME5 agree/disagree	For them, most of the information people read on social media confirms the opinion they already have.

Personal media locus of control	LOC1 true/false	Before I forward a WhatsApp message, I always check that the content is correct.
	LOC2 true/false	I decide who I get to see information from on social media.
	LOC3 true/false	Personal data on my mobile phone
	LOC4 true/false	I know how to turn off push notifications or app notifications on my phone.
	LOC5 true/false	When I am asked to 'accept' cookies, I always click 'Accept All'. (reverse coded)
Content analysis and evaluation skills	SK1 agree/disagree	The message in this YouTube video is reliable: https://youtu.be/GT3pcfmNdX4 (reverse coded)
	SK2 agree/disagree	https://ukraine.ua/ is a reliable website to look up information about the war in Ukraine. (revers coded)
	SK3 agree/disagree	This report on the RTL News site about Covid-19 is reliable https://www.rtlnieuws.nl/entertainment/royalty/artikel/5113131/gezin-prins-laurent-getroffen-door-coronavirus For Flanders suggest using this message: Dutch Princess Beatrix (83) tests positive for coronavirus | Royalty | hln.be
	SK4 agree/disagree	This infographic contains reliable information about Covid-19 and water: Infographic
	SK5 agree/disagree	This video contains reliable information about Covid-19 https://fb.watch/4-QIgwlIFT/. (reverse coded)

Process evaluation

In the classes, I learnt many new things. very much agree - agree - disagree - very much disagree - don't know
I enjoyed participating in the classes. very much agree - agree - disagree - very much disagree - don't know
What I have learnt I will put into practice. very much agree - agree - disagree - very much disagree - don't know
I think I am now able to tell the difference between disinformation and reliable news. very much agree - agree - disagree - very much disagree - don't know
I would like to learn more about the subject of disinformation very much agree - agree - disagree - very much disagree - don't know

Annex 4: Knowledge test after the train-the-trainer workshops for the trainers from the Netherlands

This knowledge test is part of the international disinformation project SMILES in which you are participating. The form consists of some introductory questions and 15 statements. We ask you to answer the statements and questions as honestly as possible. Your answers will be processed anonymously. The purpose of the knowledge test is solely to measure the effectiveness of the workshops. You will need about 5 minutes to answer all the questions.
☑ I have read the information about the study and I agree to participate.
This survey is anonymous and will take place before and after your participation in the SMILES project. In order to compare these two completed knowledge tests, we will give you a unique code. This code is based on the answers to the three questions we will ask you below. This way, the researchers do not need to know your name or other personal details and the study remains anonymous. What is your day of birth? Please enter your day of birth as 2 digits. If your day of birth consists of only 1 digit, start with 0. Example: if you were born on 5 December, enter 05. What are the first 2 letters of the street you currently live on? What are the last 2 digits of your personal mobile phone number?
Demographic items: I am a he, she, other What is your age? What is the highest education you have attended? Secondary education MBO Bachelor Master PhD/PhD Other What language(s) do you speak at home? (Tick all that apply) Dutch French English Moroccan Arabic/Berber Turkish Chinese/Mandarin Polish Other, namely...
How many years of experience do you have in teaching or training? <open>

Items in Dutch		
Of the statements below, please indicate whether you think they are true or false, or if you don't know.		
Where	Not true	I don't know

Latent variable		Items in Dutch
Knowledge and understanding of how the media is organised	KMO3 true/false	People who publish posts on Twitter about the war in Ukraine normally do extensive research first. (reverse coded)
	KMO4 true/false	Journalists help Facebook fact-check posts about Covid-19 but not all posts can be checked.
Knowledge and understanding of media content types	KMC2 true/false	Some posts on social media are meant to damage other people, for example politicians.
	KMC4 true/false	Posting a picture on Snapchat won't hurt because it will be deleted after 10 seconds anyway. (reverse coded)
Knowledge and understanding of media effects	KME2 true/false	If a Tweet (a message on Twitter) is often retweeted, it must also be trustworthy. (reverse coded)
	KME3 true/false	On social media, negative news gets more attention than positive news.
Personal media locus of control	LOC4 true/false	I know how to turn off push notifications or app notifications on my smartphone.

Of the statements below, please indicate whether you agree or disagree, or don't know.			
Agree	Agreed	Disagree	I don't know

Latent variable		Items in Dutch
Knowledge and understanding of media effects	KME1 agree/ disagree	Someone who is caught off guard by a Twitter storm (an unexpectedly large number of negative posts about him or herself) is to blame. (reverse coded)
	KME4 agree/ disagree	Two people reading the same post on Covid-19 can still get very different information from it.
	KME5 agree/ disagree	For them, most of the information people find on social media confirms the opinion they already have.
Content analysis and evaluation skills	SK1 agree/ disagree	The message in this YouTube video is reliable: https://youtu.be/GT3pcfmNdX4 (reverse coded)
	SK2 agree/ disagree	https://ukraine.ua/ is a reliable website to look up information about the war in Ukraine. (reverse coded)
Latent variable		Items in Dutch

Content analysis and evaluation skills	SK3 agree/ disagree	This report on the RTL News site about Covid-19 is reliable https://www.rtlnieuws.nl/entertainment/royalty/artikel/5113131/gezin-prins-laurent-getroffen-door-coronavirus
	SK4 agree/ disagree	This infographic contains reliable information about Covid-19 and water: Infographic
	SK5 agree/ disagree	This video contains reliable information about Covid-19 https://fb.watch/4-QIgwlIFT/. (reverse coded)

Process evaluation

What did you like about the training?
At what point or points do you think the training could be improved?
What could we do so that you can take ownership of the training content even better?
I am now able to deliver media literacy training on disinformation to young people myself. strongly agree - agree - neutral - disagree - strongly disagree

Annex: 5 Quantitative results and analyses

Validate
The final knowledge tests were assessed by colleagues from The Hague University of Applied Sciences, participants of the SMILES project and by a researcher from the Universitat Pompeu Fabra (UPF) in Barcelona, Mittzy Arciniega. Arciniega is involved in Edumediatest, another media literacy assessment project funded by the European Commission. The knowledge tests were then submitted to 97 HBO-ICT bachelor students from The Hague University of Applied Sciences (of which 87 were male, 8 female and 2 other). The results were analysed using a reliability test in SPSS. This test was performed three times so that only items with sufficient correlation remained (see table 1). Finally, 10 questions were removed from the trainers' knowledge test and 15 statements remained.

Because the age and educational level of undergraduate students at The Hague University of Applied Sciences is expected to be higher than the students aged 12-15 in this study, and almost equal to the level of trainers, only in the 'train-the-trainer' knowledge tests were scaffolds removed. Validation of the learner knowledge tests was done only after the knowledge test came out of the field. See the results of this validation in Table 2. In the end, one question was removed from the student knowledge test and 24 statements remained.

First iteration N of items 25 Cronbach's Alpha .750 Items were deleted if Corrected Item-Total Correlation < .300 and Cronbach's Alpha If Item Deleted > .750: kmo1, kmo2, kmc1, loc1 and loc2 are deleted. Second iteration N of items 20 Cronbach's Alpha .763 Items were deleted if Corrected Item-Total Correlation < .300 and Cronbach's Alpha If Item Deleted > .763: kmc3, kmc5, loc3 and loc 5 are deleted. Third iteration N of items 16 Cronbach's Alpha .789 Items were deleted if Corrected Item-Total Correlation < .300 and Cronbach's Alpha If Item Deleted > .789: kmo 5 is deleted.

Table 1: Results of SPSS reliability analysis 'train-the-trainer' knowledge test

First iteration N of items 25 Cronbach's Alpha .803 Items were deleted if Corrected Item-Total Correlation < .300 and Cronbach's Alpha If Item Deleted > .803: Kmo2 is deleted. *Second iteration* N of items 24 Cronbach's Alpha .823 Items were deleted if Corrected Item-Total Correlation < .300 and Cronbach's Alpha If Item Deleted > .823: no further items are deleted.

Table 2: Results of SPSS reliability analysis scholastic knowledge test
Results total students

To link the knowledge tests completed before lessons with the knowledge test completed afterwards, students were asked to answer three questions (day of birth, first 2 letters of the street they live in and the last 2 digits of their telephone number). Together, the answers to these three questions form a code by which a respondent can be recognised and with which the knowledge keys of the same person can be juxtaposed. The codes were corrected for capitalisation (sometimes someone entered everything in capitals in one knowledge key, and in lower-case letters in the other. These were still linked together). 56 times, the same code was entered in both knowledge tests. This means that only 56 people's knowledge tests can be linked together. Of the total 547 completed knowledge keys, 435 times a unique code was filled in that does not occur again in the dataset. This may be because the respondent only completed one knowledge test. Or because a respondent answered the 3 control questions differently in one knowledge test than in the others. Because the knowledge tests cannot be linked to each other on an individual level, a comparison was only made on the total average of all completed knowledge tests prior to attending classes, and the total average of all completed knowledge tests after attending classes. 3 completed knowledge tests were clearly not completed seriously. Weird open-ended answers were given, or the figure 69 was entered everywhere or 99 was entered as age. Nevertheless, this respondent's answers were included in the analysis because it is not certain whether the statements were filled in seriously.

The pre-lesson knowledge test was completed a total of 298 times among European pupils: 186 times in the Netherlands, 41 times in Belgium and 71 times in Spain. Of these 298 pupils, 11% indicated that they had talked to their parents/carers about their participation in the SMILES lessons, nine out of ten did not talk about this. Of the pupils, 55% are male, 42% female and 2% identify differently. The average age is 13.8. Below are the background characteristics of the pupils by country.

Of the 186 Dutch schoolchildren who completed the pre-class knowledge test, 57% were male, 41% female and 2% other. The average age is 13.4 years. Dutch pupils mainly attend havo education (47%) and vmbo education (36%); 8% are in a combination class havo/vwo. 97% of Dutch pupils speak Dutch at home, 13% speak (also) English at home, and 4% speak (also) Turkish. Other languages are hardly mentioned. Of the pupils from the Netherlands, 7% talked to their parents about participating in the SMILES lessons.

54% of the 41 Belgian schoolchildren who completed the pre-lesson knowledge test are male, 46% are female; they are on average 14.7 years old. The majority of Belgian school pupils, 86%, currently follow the second grade secondary TSO education; 5% follow the first grade secondary education, and 10% say they follow another level of education. 93% of Belgian pupils speak Dutch at home and 10% speak (also) English and 7% (also) Turkish. Other languages are almost not mentioned. None of the schoolchildren from Belgium discussed the SMILES lessons with their parents at home.

Of the 71 pupils who completed the pre-lesson knowledge test in Spain, 52% were male, 42% female and 5% other. The average age was 14.5 years. Of Spanish secondary school students, almost all, 98%, attend ESO education. 67% of Spanish students speak Spanish at home, 71% speak Catalan and 7% speak English. 30% of Spanish students have talked about SMILES lessons at home.

Scores total students

On average, European students as a whole scored 12.8 points in the knowledge test prior to the lessons. The maximum number of points to be scored is 24. None of the pupils scored 24 points. The highest score is 21 points (only one pupil managed to achieve this score). The average is almost the same for the different countries, see the table below. The Dutch and Belgian pupils have a slightly higher mean than those from Spain, but this difference is not significant revealed by a one-way ANOVA test, $F(2, 295) = .159$, $p = .853$.

Total score pre-lesson student knowledge test by country			
Country	Average	N	Std. deviation
Netherlands	12,89	186	4,122
Belgium	12,90	41	3,604
Spain	12,59	71	3,686
Total	**12,82**	**298**	**3,944**

Table 3

Whether or not students talked to their parents about taking the SMILES lessons causes a small difference in the mean score, see the table below, but this difference is not significant: one-way ANOVA test F (1, 296) = .549, *p* = .459.

Total score pre-lesson student knowledge test students 'talked about SMILES lessons'			
	Average	N	Std. deviation
"Yes, I talked to my parents"	13,29	34	3,495
"No, I have not spoken to my parents"	12,76	264	4,000
Total	**12,82**	**298**	**3,944**

Table 4

Results and analysis knowledge test after total schooling
A total of 249 knowledge tests were completed by pupils after attending classes. 127 in the Netherlands, 38 in Belgium and 86 in Spain.

The score obtained by pupils on average in the knowledge test prior to attending classes (M = 12.8; SD = 3.94) and the score obtained by pupils afterwards (M = 12.3; SD = 4.73) did not differ significantly revealed by a t-test (*t* (545) = 1.383; *p* .084).

Also in the results of the post-lesson knowledge test, the fact that pupils discussed their participation in the SMILES lessons with their parents or guardians did not significantly affect their final scores. The difference in mean final score for pupils who discussed SMILES with their parents (M = 12.6; SD = 4.74) and pupils who did not discuss it with their parents (M = 12.2; SD = 4.74) is not significant (*t* (247) = .553; *p* .290).

Total score post-lesson student knowledge test students 'talked about SMILES lessons'			
	Average	N	Std. deviation
"Yes, I talked to my parents"	12,61	57	4,742
"No, I have not spoken to my parents"	12,22	192	4,739
Total	**12,31**	**298**	**4,733**

Table 5

Differences do exist between the scores obtained in the knowledge test completed after the lessons in the different countries. Pupils in Belgium scored highest in this knowledge test with an average of 13.9

points, followed by Dutch pupils with 12.6 points and Spanish pupils achieved 11.2 points. This difference is not significant is shown by the one-way ANOVA analysis F (1, 246) = 4.946, *p* = .008.

Total post-lesson student knowledge test score by country			
Country	Average	N	Std. deviation
Netherlands	12,58	126	4,895
Belgium	13,92	38	3,364
Spain	11,19	85	4,790
Total	**12,31**	**249**	**4,733**

Table 6

The gender of secondary school students makes a difference in the final score obtained in the knowledge test after taking the lessons; males achieve a lower score on average than females. But this difference in mean final score for females (M = 13.1; SD = 4.46) and males (M = 11.9; SD = 4.76) is not significant (*t* (236) = 2.00; *p* .023).

Age also has no significant effect on the final score obtained after attending classes is shown by a single regression analysis, *F* (3, 245) = 3.403, *p* .018.

No cross correlations were tested on the other background characteristics. The reason for this is too low N for the underlying subgroups; for example, in each country, educational levels and home-spoken languages are different, making the groups per educational level or spoken language too small.

Following the literature review which is described in chapter 2, the knowledge tests were developed containing rating scales for five dimensions of media literacy:

- Knowledge and understanding of how media are organised (Kmo);
- Knowledge and understanding of media content types (kmc);
- Knowledge and understanding of media effects (kme);
- Personal media *locus of control* (loc);
- Content analysis and evaluation skills (sk).

To measure each dimension, a number of statements were devised for each dimension, which students were required to say whether they were correct or incorrect. Based on these, the final score was calculated. In addition, a score per dimension was also calculated for the students. No significant results were seen in the scores per dimension either. See the table below for the scores obtained per dimension.

	Score pre-lesson knowledge test	**Score post-lesson knowledge test**
Kmo	2,3	2,1
Kmc	3,2	3,0
Kme	2,9	2,8
Loc	2,7	2,7
Sk	1,7	1,8

Table 7

Below are the background characteristics of the schoolchildren by country. The questions related to the language spoken at home are multiple-choice and thus the percentages do not add up to 100%.

A total of 127 knowledge tests were completed by secondary school students in the Netherlands after attending classes. Of these, 58% were male, 41% female and 2% other. The average age was 13.5 years. 40% follow havo education, 21% follow vmbo and 17% are in a combination class vmbo/havo. 10% are in a combination class havo/vwo and 10% also mention something else. 2% are following vwo education. 97% of pupils speak Dutch at home, 11% speak (also) English, 7% Turkish, 5% Arabic and 3% Moroccan.

The mean score of Dutch students in the knowledge test before attending classes is 12.90; in the knowledge test after attending classes, it is 12.58. This difference is not significant is shown by the one-way ANOVA F (1, 310) = .372, *p* = .542.

The assessment questions on the building blocks show that half of the pupils in Holland said they learnt many new things. 43% enjoyed participating in the lessons. 41% say they will apply what they have learned in practice. 59% think they are now able to tell the difference between disinformation and reliable news. A quarter of Dutch students, 24%, say they would like to learn more about the topic of disinformation. See all answers to the evaluation questions below.

In the classes, I learnt many new things.		
	Number	Percentage
Totally agree	18	14,2
Agreed	45	35,4
Disagree/disagree	47	37,0
Disagree	8	6,3
Completely disagree	9	7,1
Total	127	100,0
I enjoyed participating in the classes.		
	Number	Percentage
Totally agree	15	11,8
Agreed	39	30,7
Disagree/disagree	52	40,9
Disagree	9	7,1
Completely disagree	12	9,4
Total	127	100,0
What I have learnt I will put into practice.		
	Number	Percentage
Totally agree	10	7,9
Agreed	42	33,1
Disagree/disagree	54	42,5
Disagree	15	11,8
Completely disagree	6	4,7
Total	127	100,0
I think I am now able to tell the difference between disinformation and reliable news.		
	Number	Percentage
Totally agree	19	15,0
Agreed	56	44,1
Disagree/disagree	41	32,3

	Disagree	5	3,9
	Completely disagree	6	4,7
	Total	127	100,0
I would like to learn more about the topic of disinformation.			
		Number	Percentage
	Totally agree	11	8,7
	Agreed	20	15,7
	Disagree/disagree	56	44,1
	Disagree	21	16,5
	Completely disagree	19	15,0
	Total	127	100,0

Table 8

A total of 38 pre-lesson knowledge tests were completed by schoolchildren in Belgium. Of these, 32% were male, 61% female and 8% other. The average age was 14.5 years. Almost all schoolchildren, 97%, follow as education the degree Technical Secondary Education TSO, 3% follow another education. The grade Technical Secondary Education TSO is comparable to havo level in Dutch education. 90% speak Dutch at home, 13% speak (also) English and 8% speak (also) French.

The mean score in the knowledge test before attending classes of Belgian schoolchildren was 12.90, the mean score in the post-lesson knowledge test was 13.92. This difference is not significant, one-way ANOVA test F (1, 77) = 1.679, *p* = .199. Other tests are not possible due to the low number of respondents in Belgium.

In Belgium, 42% of students say they learned new things in the lessons, also 42% say they enjoyed participating in the lessons. 50% say they will apply what they have learned in practice and 63% think they will be able to tell the difference between disinformation and reliable news. Almost a quarter, 24%, say they would like to learn more on the subject of disinformation. See the results in tabular form below.

In the classes, I learnt many new things.			
		Number	Percentage
	Totally agree	3	7,9
	Agreed	13	34,2
	Disagree/disagree	17	44,7
	Disagree	2	5,3
	Completely disagree	3	7,9
	Total	38	100,0
I enjoyed participating in the classes.			
		Number	Percentage
	Totally agree	3	7,9
	Agreed	13	34,2
	Disagree/disagree	15	39,5
	Disagree	6	15,8
	Completely disagree	1	2,6
	Total	38	100,0

What I have learnt I will put into practice.			
		Number	Percentage
	Totally agree	3	7,9
	Agreed	16	42,1
	Disagree/disagree	12	31,6
	Disagree	4	10,5
	Completely disagree	3	7,9
	Total	38	100,0
	I think I am now able to tell the difference between disinformation and reliable news.		
		Number	Percentage
	Totally agree	6	15,8
	Agreed	18	47,4
	Disagree/disagree	11	28,9
	Disagree	3	7,9
	Total	38	100,0
I would like to learn more about the topic of disinformation.			
		Number	Percentage
	Totally agree	4	10,5
	Agreed	5	13,2
	Disagree/disagree	15	39,5
	Disagree	9	23,7
	Completely disagree	5	13,2
	Total	38	100,0

Table 9

A total of 86 secondary school students in Spain completed the post-lesson knowledge test. Of these, 45% were female, 47% male and 8% other. The average age is 13.5 years. Almost all schoolchildren, 95%, attend ESO education. The level of ESO education is comparable to havo education in the Netherlands. 1% follow Educación Primaria and also 1% Formación Profesional; 2% follow another type of education. 84% of the schoolchildren speak Spanish at home, 45% (also) speak Catalan, 9% also English and 8% Arabic.

The mean score of Spanish students prior to the lessons is 12.59, and after the lessons the mean score is 11.19. This difference is not significant, one-way ANOVA test F (1, 154) = 4.076, p = .045. Other tests are not possible due to the low number of respondents in Spain.

44% of students in Spain say they learned many new things in the lessons, 43% enjoyed participating in the lessons. 44% will apply what they have learned in practice and also 44% say they are now able to tell the difference between disinformation and reliable news. 35% say they want to learn more about the subject.

In the classes, I learnt many new things.			
		Number	Percentage
	Totally agree	12	14,0
	Agreed	26	30,2
	Disagree/disagree	39	45,3
	Disagree	3	3,5
	Completely disagree	6	7,0

	Total	86	100,0
I enjoyed participating in the classes.			
		Number	Percentage
	Totally agree	11	12,8
	Agreed	26	30,2
	Disagree/disagree	39	45,3
	Disagree	6	7,0
	Completely disagree	4	4,7
	Total	86	100,0
What I have learnt I will put into practice.			
		Number	Percentage
	Totally agree	11	12,8
	Agreed	27	31,4
	Disagree/disagree	34	39,5
	Disagree	6	7,0
	Completely disagree	8	9,3
	Total	86	100,0
I think I am now able to tell the difference between disinformation and reliable news.			
		Number	Percentage
	Totally agree	11	12,8
	Agreed	27	31,4
	Disagree/disagree	35	40,7
	Disagree	8	9,3
	Completely disagree	5	5,8
	Total	86	100,0
I would like to learn more about the topic of disinformation.			
		Number	Percentage
	Totally agree	12	14,0
	Agreed	18	20,9
	Disagree/disagree	35	40,7
	Disagree	11	12,8
	Completely disagree	10	11,6
	Total	86	100,0

Table 10

Results total teachers and library professionals

The knowledge test prior to attending the train-the-trainer workshops was completed a total of 77 times. After analysis, it was found that an incorrect invitation link had been sent to some of the participating secondary school students in the Netherlands. Of the total 77 knowledge tests filled in prior to the train-the-trainer by the trainers, after analysing the ages filled in, it was found that 43 of these 77 fillers were schoolchildren (with an age between 9 and 13 years). All these knowledge tests were filled in on 30 or 31 January 2023 from which it is also clear that the link provided is wrong. Unfortunately, these completed knowledge tests are unusable because the knowledge test for pupils has 25 statements and that for trainers has 15. These 43 completed knowledge tests were therefore removed from the sample, leaving 34 train-the-trainer knowledge tests completed by trainers.

In total, after correction, 56 knowledge tests were completed by trainers. Of these, 34 knowledge tests were completed prior to the train-the-trainer and 22 post-training knowledge tests. To link these

completed knowledge tests at the person level, trainers were asked to answer three questions (day of birth, first 2 letters street and last 2 digits phone number). Together, the answers to these three questions form a code by which a respondent can be recognised and with which the knowledge tests of the same person can be juxtaposed. The codes for linking the knowledge tests were corrected for capitalisation (sometimes someone entered everything in capitals in one knowledge test, and in lower-case letters in the others. These were still linked together). Only 9 people were able to link both knowledge tests. In 38 of the completed knowledge tests, these are both ex ante and ex post knowledge tests, a unique code was entered that does not occur again in the dataset. This could be because the respondent only completed one knowledge test. Or because a respondent answered the 3 control questions differently in one of the knowledge tests than in the other knowledge test. Because the knowledge tests cannot be linked at an individual level, a comparison was only made on the total average of all completed knowledge tests prior to the train-the-trainer, and the total average of all completed knowledge tests after the train-the-trainer. Due to the low number of respondents, it was not possible to analyse further breakdowns or cross-relationships.

Of the total 34 completed train-the-trainer pre-training knowledge tests, 12 were completed in the Netherlands, 9 in Belgium and 13 in Spain. Of the total respondents in the train-the-trainer pre-training knowledge test for trainers, 59% are male, 38% female and 3% identify themselves differently. The average age is 43.3 years. On average, participating trainers have 13.2 years of experience in teaching and training.

On average, European trainers scored 10.6 points in the pre-training knowledge test. The maximum obtainable score was 15 points, this was not achieved by anyone. The highest score obtained was 14 points, 12% of trainers achieved this 14 points. The average for the different countries differs: Dutch trainers achieved an average of 10.1 points, Belgian trainers achieved 11.8 points and Spanish trainers 10.4 points (see table below). This difference is not significant revealed by a one-way ANOVA test F (2, 31) = .946, p = .399.

Total score of pre-training knowledge test among trainers by country

Country	Average	N	Std. deviation
Netherlands	10,08	12	3,75278
Belgium	11,78	9	2,38630
Spain	10,38	13	2,32875
Total	**10,65**	**34**	**2,92204**

Table 11

Below are the results of the train-the-trainer knowledge test described by country. The questions related to the language spoken at home are multiple-choice and thus the percentages do not add up to 100%.

Of the 12 Dutch trainers who completed the knowledge test prior to the workshops, 25% are male and 75% female; the average age is 39.3 years. Of the 12 trainers, 67% have a bachelor's degree as their highest education, 17% have secondary education as their highest education and 8% have a master's degree. 100% of the trainers speak Dutch at home, 8% speak (also) English and 8% (also) Turkish. On average, Dutch trainers have 11 years of experience providing education or training.

Of the 9 Belgian trainers, 33% are male and 67% female, and the trainers are on average 47.8 years old. More than half (56%) have a master's degree, 33% have a bachelor's degree and 11% have a doctoral degree (i.e. a PhD from a university). 100% of Belgian trainers speak Dutch at home, 11% of them (also) speak French. On average, trainers from Belgium have 14.1 years of experience in teaching or training.

54% of the 13 Hispanic trainers are male, 39% female and 8% identify differently or do not want to name the gender. On average, they are 43.8 years old. Spanish trainers mainly, 43%, have a Licentiate (the standard academic degree obtained after 4-5 years of university study), 21% have a Maestría and 29% mention another level of education. 57% of Spanish trainers speak Spanish at home, 64% speak Catalan, 14% speak (also) Vasco and 7% speak (also) English. On average, Spanish trainers have 14.7 years of experience in providing education and training.

Results and analysis of teachers and library professionals

There were 22 post-training knowledge tests completed; 16 in the Netherlands, eight in Belgium and 17 in Spain.

On average, the European trainers scored 11.8 points in the knowledge test after the training. Again, the maximum obtainable score was 15 points, this was not achieved by anyone. The highest score obtained was 14 points, 14% of the trainers achieved this 14 points. The average for the different countries differs: Dutch trainers achieved an average of 12.1 points, Belgian trainers achieved 11 points and Spanish trainers 11.3 points (see table below). This difference is not significant revealed by a one-way ANOVA test F (2, 21) = 1.079, p = .360.

Total post-training knowledge test score among trainers by country			
Country	Average	N	Std. deviation
Netherlands	12,21	14	1,424
Belgium	11,00	5	2,236
Spain	11,33	3	2,082
Total	**11,81**	**22**	**1,708**

Table 12

On average, European trainers scored 10.6 points in the pre-training knowledge test and 11.8 points in the post-training knowledge test. Thus, the score afterwards is higher than that in the pre-training knowledge test. This difference is not significant is shown by a one-way ANOVA test F (1, 54) = 2.884, p = .095.

To what extent do you agree with this statement: I am now able to provide media literacy training on disinformation to young people myself.		
	Number	Percentage
Totally agree	1	4,5
Agreed	14	63,6
Disagree/disagree	5	22,7
Disagree	2	9,1
Total	22	100,0

Table 13

The following describes the background of the trainers conducting the post-training knowledge test in the different countries.

A total of 16 Dutch trainers completed the knowledge test after attending the train-the-trainer. Of these, 31% were male and 69% female. The average age was 42 years. 37.5% of the respondents have a Bachelor degree, 18.8% a Master and 6.3% have secondary education as their highest level of education. All trainers speak Dutch at home, 6% additionally speak English. On average, they have 14.5

years of experience in teaching and training. 71% (fully) agree with the statement "I am now able to give media literacy training on disinformation to young people myself"; 21% are neutral on this statement and 7% disagree. Dutch trainers obtained on average 10.1 points prior to the training and 12.2 points in the knowledge test after attending the training. But this difference is not significant revealed by a one-way ANOVA test F (1, 24) = 3.885, *p* = .060.

There are only 8 completed knowledge tests in Belgium after attending the training. Of these 8 fillers, 25% are male and 75% female. 50% have a Bachelor's degree, 37.5% a Master's and 12.5% are Dr. All respondents speak Dutch at home. The average age is 36.5 years. Respondents have on average 7.3 years of experience in teaching and training; answers given range from 1 to 15 years. Of Belgian trainers, 60% said they agreed with the statement "I am now able to give media literacy training on disinformation to young people myself"; 20% were neutral and 20% disagreed. Belgian trainers scored an average of 11.8 points in the knowledge test prior to the train-the-trainer and 11 points in the knowledge test afterwards. But this difference is not significant revealed by a one-way ANOVA test F (1, 12) = .356, *p* = .562.

A total of 17 Spanish trainers completed the knowledge test after the train-the-trainer. Of these, 71% were women, 14% men and 14% did not want to say. The average age of the respondents was 42.1 years. 29% have a Licenciatura as their educational background, also 29% a Master's and also 29% a PhD. 71% speak Spanish at home, 86% (also) speak Catalan. On average, trainers have 10.6 years of teaching and training experience. 67% say they agree with the statement "I am now able to deliver media literacy training on disinformation to young people myself"; 33% are neutral on this. Spanish trainers achieved an average of 10.4 points prior to the training and 11.3 points afterwards. But this difference is not significant revealed by a one-way ANOVA test F (1, 14) = .417, *p* = .529.

In the analysis of the trainers' results, it was not possible to calculate the scores on the five dimensions of media literacy because some dimensions are based on only 1 question. In addition, the number of respondents among trainers is too low to make statements.

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