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Young Digital Leaders

Impact Report

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Contents

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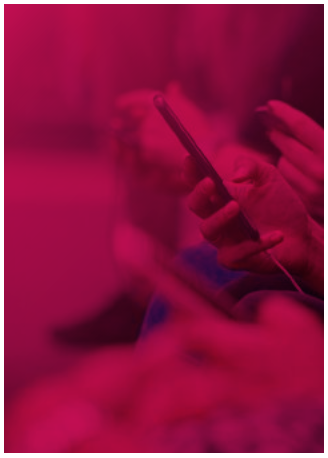

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We would first and foremost like to thank the Italian, Romanian and Swedish students, teachers and parents who so generously provided their time in taking part in our pilot project, and in doing so made this report possible. Their genuine, thoughtful and animated contributions lie at the heart of the success of Young Digital Leaders, and have laid the groundwork for far-reaching and impactful developments in the digital citizenship education space.

We are indebted to Google, whose generous support has allowed us to undertake this work. A special mention goes to Catherine Williams for her unrelenting hard work, dedication and passion, without which this pilot would not have been possible.

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Any mistakes or omissions are the authors' own.

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1 Executive Summary

The Young Digital Leaders Pilot

Young Digital Leaders is a Europe-wide education pilot project aiming to empower young people through digital citizenship, critical thinking and media literacy skills, so that they can become tomorrow's digital leaders. The project, developed in partnership with Google, was created in order to equip young people with the skills they need to be safe, powerful and effective online citizens in the 21st century, and to explore new ways of teaching digital citizenship in formal educational settings in Europe. The pilot phase has pioneered a unique, collaborative partnership model between students, teachers, parents and local civil society organisations across Europe.

There were three main elements to the project:

- directly providing young people with digital citizenship education;
- providing their parents with complementary education sessions on digital citizenship;
- providing educators with content and materials they could use to continue delivery sustainably in the longer term.

ISD and three local partner organisations – A Rocca, GEYC and Kommon Ground – delivered Young Digital Leaders in three schools in Italy, Romania and Sweden and ran three parent engagement sessions. ISD trained 12 facilitators from the local partner organisations in the Young Digital Leaders curriculum and delivered workshops to 260 students aged 13–16 and 40 parents.

The sessions were subject to a robust evaluation process, with pre and post surveys administered to participating parents and participating classes, and compared against a comparison group of classes within the same schools. The evaluation included six focus groups with participating young people and parents, and six interviews with teachers who participated in the school workshops. This report describes the logic of the project and its content and the findings of our pilot study, designed to provide evidence of efficacy and improve future delivery.

Key Findings

The evaluation returned mixed results in the delivery to students, with positive results that demonstrated the value of the project and a number of other results that suggest where improvements in content or delivery need to be made. Students overwhelmingly found the project a positive and valuable experience, and felt it would change their online behaviour.

61% of student participants said the session would change how they act online

In the delivery to parents, the results were very positive, demonstrating both the need for digital citizenship education for parents and how this can be provided effectively.

These are some of the key findings on the delivery to student participants:

- 61% felt that the workshops would change how they act online.
- 82% enjoyed the workshop.
- 69% felt they gained new skills, and 79% felt they gained new knowledge.
- 50% felt confident that they understood what 'echo chambers' were; there was an 84% increase in confidence between pre and post surveys.[1]
- 46% felt confident that they understood what a 'filter bubble' was; there was a 96% increase in understanding between pre and post surveys.
- 60% felt confident that they understood what 'scapegoating' was; there was a 32% increase in understanding between pre and post surveys.
- 85% felt confident that they would be able

to identify 'fake news' online; there was a 15% increase in confidence of this ability between pre and post surveys.

These are some of the key findings on the delivery to parent participants:

- 79% said they were more likely to have a conversation with their children about online safety as a result of the project, and 79% would recommend this session to other parents.
- 69% felt more able to help their children deal with online safety challenges.
- 9% felt confident that they know how hate groups use the internet; there was a 23% increase in confidence between pre and post surveys.
- 56% felt confident they would know what to say if their child/children asked questions about online challenges like fake news; there was a 12% increase in confidence between pre and post surveys.
- 53% felt confident that they know what practical steps they can take to help their child use the internet safely; there was a 13% increase in confidence between pre and post surveys.
- 56% felt confident that they would know what to do if they came across hate speech online; there was a 35% increase in confidence between pre and post surveys.
- 66% felt confident that they would know how and why to 'flag' or report social media content; there was a 56% increase in confidence between pre and post surveys.

> "Adult digital citizenship education is both essential for and valuable in developing key digital safeguarding skills"

- 73% felt confident that they would be able to identify 'fake news'; there was a 23% increase in confidence between pre and post surveys.

Key Outcomes

- The project had positive results in improving fundamental digital citizenship capacities among students, especially increasing their digital skills and knowledge.
- The informal workshop format and interactive, collaborative learning method was popular with student participants, who gained new knowledge and skills fast within a short timeframe.
- There were positive impacts across vital digital citizenship measures for parents, spanning media literacy, attitudinal change and skills and knowledge gain, demonstrating the need for and effectiveness of adult digital citizenship education.
- This evaluation shows that adult digital citizenship education is both essential for and valuable in developing key digital safeguarding skills for parents to complement pre-existing offline safeguarding knowledge.

Areas for Improvement

- The workshops had no significant positive effects on attitudinal change among students who participated in them, suggesting that session modules on these hugely important measures of digital citizenship should be revised.
- Student knowledge and skills gain and retention would be even more effective if the sessions were embedded within national curricula and delivered regularly over more than two hours to a wider age group.
- The efficacy of adult digital citizenship education would increase and engagement levels with parents would be even higher and more successful through a different delivery method.
- There is a long-term need for comprehensive and collaborative digital citizenship education across the groups in societies that are the closest to and most influential with young people.

2 Digital Citizenship Education in National Contexts

Introduction

One of the most pressing challenges that face societies across the globe today is how to balance the precious freedom and connective power of the internet while mitigating the harms that digital technologies can pose, from information manipulation to trolling and extremist content. Digital tools can be used to undermine social cohesion, catalyse political polarisation, and undermine trust between groups and within institutions. Manipulation, disinformation and conspiracy theories threaten our democratic systems and disrupt our ability to respond effectively to civic challenges, while online hate threatens our relations with each other.

Confronting these challenges requires action from government, civil society and technology companies. Yet it is individuals who sit at the heart of these challenges and they need to be empowered to deal with them. Young people who have grown up in the internet era as digital natives are frequently the most vulnerable to its risks. Being a digital native by no means guarantees digital literacy, and young people are frequently the targets of extremist movements and hate groups, and of abuse and grooming. They are often the strongest voices against extremism and hate. When young people do not understand these online challenges and are not equipped with the skills needed to address them, they are vulnerable to harm. Similarly when they understand and want to challenge these issues, they are often ill-equipped to do so or are poorly supported.

European governments are adjusting their citizenship education approaches to consider citizens in an online context

We need to address these challenges in a manner proportionate to the threat they pose. We need to equip young people with the capacities they need not just to build resilience to online harms, but to push back against them. Providing critical thinking and media literacy education, and promoting practical digital citizenship skills to address online problems, must be a cornerstone of our response.

As the digital world becomes increasingly central to our lives as citizens, European governments are adjusting their citizenship education approaches to consider citizens in an online context. Yet the scale of the response is still too small, too dependent on inconsistent delivery by civil society actors, and too focused on digital safety skills rather than attitudinal and behavioural transformation regarding the role of citizens in the online space.

For the past three years, ISD has been developing and testing curriculum and pedagogical approaches to teach critical thinking skills and online awareness techniques in an engaging and effective manner. The aim is to develop scalable models to undermine the efforts of extremist groups and hate movements to manipulate young people, with positive evidence of impact.

In this report, we present the findings from our Young Digital Leaders project. It forms part of a growing body of evidence collected by ISD from pilot projects and ongoing programmes across Europe, which suggests that digital citizenship educational approaches can be an effective tool for increasing the resilience of young people to extremist grooming and exploitation online.

National Contexts

The Young Digital Leaders project provided ISD with an excellent opportunity to build on our high body of evidence and pilot our digital citizenship approach in three very different European educational systems in Italy, Romania and Sweden.

The way digital citizenship is taught in regular classes, through what subjects and at what age group varies significantly across European national educational contexts. The diverse educational situations of these countries and their implications for further digital citizenship education delivery are considered below.

Italy

Recent reforms to Italian citizenship education have sought to introduce new guidance and supporting materials for teachers in order to improve the quality of citizenship education. In 2012, new national guidelines for developing competence-based education came into being, while in 2015 principles, objectives and guidelines were provided to schools that underscored the need to deliver citizenship education. However, these guidelines and objectives are loose. Italy enjoys a significant degree of school autonomy, and as a result central government does not define specific learning outcomes or detailed objectives for citizenship education. Instead, these are the responsibility of individual schools.

Whole-school approaches to citizenship are promoted through legislation in Italy, and schools are encouraged and empowered to engage with local communities, families and non-governmental organisations (NGOs). As a result of this permissive environment, the Young Digital Leaders model of digital citizenship, which is provided by NGOs with parental engagement, should be particularly popular in Italian schools.

Given the renewed attention to citizenship education at the policy level in Italy, and the unique flexibility of schools in delivering it, Italy presents an excellent opportunity for digital citizenship education provided by NGOs. That being said, the inability of Italian government to prescribe detailed requirements about citizenship provision to schools limits the potential for rapid national development in this space.

Romania

The Romanian citizenship education system is complex. In Romania, citizenship education is integrated into other subjects in early primary, after which it becomes a subject in its own right. Citizenship education is compulsory in primary and lower secondary education and is offered through optional subjects at the upper secondary level. In early primary, citizenship is integrated into other subjects rather than forming its own separate subject area. In later primary it is compulsory, after which it is compulsory only in selected years of lower and upper secondary education.

The overall picture is the delivery of compulsory citizenship within some grades of education but not others, with optional citizenship education opportunities filling those gaps. 'Personal development' classes, roughly the equivalent of personal, social, health and economic (PSHE) classes in the UK, provide one important delivery vehicle for citizenship education. While lessons incorporating compulsory citizenship education are a feature of general Romanian upper secondary education, no such subjects are taught in vocational education. Moreover, Romania is one of three countries in Europe where optional subjects that integrate aspects of citizenship education are not even offered in vocational schools. Therefore some teenagers do not benefit from citizenship education at all at this stage, limiting the opportunity for intervention. This is perhaps partly due to a lack of a common curriculum in vocational schools.

This uneven provision of citizenship education across types of school and years of education could limit the potential for the multiyear provision of digital citizenship education, so if digital citizenship is offered by necessity, it has to focus on specific year groups, yet there are certainly opportunities to deliver digital citizenship in Romanian schools.

Sweden

In Sweden, citizenship education is not a separate subject, but is threaded throughout the curriculum using a whole-school approach, and is presented in the curriculum. While there is no specific media education module or explicit cross-curricular requirement for media education, there are implicit references to it in Swedish curricula, presenting opportunities to explore media literacy in the context of citizenship.
Within this whole-school approach, Social Studies, which is compulsory in its basic form in both vocational and university preparatory education, is the clearest vehicle for digital citizenship education, containing as it does the objective of developing "the ability to search for, critically examine and interpret information from different sources and assess their relevance and credibility". History and Religion, which again are fundamentally compulsory courses, provide other potential avenues for digital citizenship education, though to a lesser degree than Social Studies.

3 The Young Digital Leaders Project

This chapter outlines the Young Digital Leaders project approach, resources and delivery model.

Our Theory of Change

Young Digital Leaders is a Europe-wide internet safety and digital citizenship skills pilot project, designed to give young people aged between 13 and 16 years old in Italy, Romania and Sweden the capacities they need to stay safe online, increase their resilience to antisocial behaviour, hate and extremism online, and become positive online citizens.

The project is skills based and intended to develop participants' media literacy, critical thinking and digital citizenship skills specific to the national and international challenges of online hate, prejudice and intolerance in the countries of delivery. The Young Digital Leaders project also aims to increase participants' understanding of propaganda, fake news, biased writing, and the arguments and techniques used by content creators to manipulate people online; and suggest ways of recognising and challenging online hate speech.

The project has sought not just to deliver technical skills, but also to develop positive attitudinal and behavioural change, which makes participants more active citizens online. The end result is that participants are not just safer online, but they can reinforce and take responsibility for the safety of their peers, and play a positive and proactive role as digital leaders in the online space.

Given the wide geographic scope of Young Digital Leaders, and the variation between social issues and education systems across European countries, this project has developed a flexible, customisable delivery model that varies and localises content to fit national contexts. It is based on a partnership model, bringing together Google, ISD and three local partner organisations, A Rocca, GEYC and Kommon Ground, to provide local education expertise and access to schools.

Context

Young people face a number of challenges that contribute to the growth of polarisation, hate and extremism online, such as disinformation and hate speech. In order to stay safe and make a positive contribution online, young people need the skills, attitudes, knowledge and behaviours that will make them more resilient to these challenges, including critical thinking, media literacy and digital citizenship skills. However, many young people do not receive sufficient education in these areas within formal or informal education, increasing their vulnerability. This project was created to equip young people with these crucial digital citizenship skills and intends to fill this educational gap.

The Participants and Delivery Model

ISD trained 12 expert facilitators from A Rocca, GEYC and Kommon Ground in how to deliver the curriculum effectively between February and April 2018. Each local partner then independently held a day-long workshop in one secondary school in Milan (Italy), Oradea (Romania) and Malmo (Sweden) to 260 participating students aged 13–16 between March and May 2018. Within the same schools, 135 students who did not take part in the three workshops comprised a comparison group. Additionally, the trained local partner facilitators delivered three two-hour long parent engagement sessions to 40 parents of the same students who participated in the school workshops.

82%

Of student participants enjoyed the workshop

79%

Of student participants felt they gained new knowledge from them

The local partners administered and collected the student participant, comparison group and parent pre and post surveys, interviewed two teachers and conducted two focus groups with participant students and parents.

Outcomes

The Young Digital Leaders project sought to deliver the following outcomes for participants:

- increased critical thinking skills when online that are specific to the contexts of Italy, Romania and Sweden;

- increased media literacy skills, and the ability to identify fake news and biased writing more effectively;
- increased digital citizenship skills, and the ability to recognise and challenge online emotional manipulation and hate speech;
- improved attitudes towards the online world, including an increased desire to act to tackle hate and extremism online and feeling of responsibility for the wellbeing of peers online;
- ultimately improved behaviours in online interactions, including flagging hate content for removal and fact checking news articles online more frequently.

Impact

As a result of participation in Young Digital Leaders, Italian, Romanian and Swedish students will be more:

- resilient to extremist grooming and propaganda online;
- able to react effectively to hateful content online;
- active digital citizens.

Fewer Italian, Romanian and Swedish young people will be drawn into extremist groups, movements and ideologies, and they will be less sympathetic to extreme and hateful viewpoints. Fewer young people will suffer the negative effects of online hate. The social networks and online spaces in which young people operate and interact will be more positive and healthy environments. This approach ultimately aims to empower more capable and resilient citizens, and in doing so disrupts the ability of extremist and hate groups to influence, exploit and recruit young people.

> “Participants are not just safer online, but they can reinforce and take responsibility for the safety of their peers”

The Curriculum, Digital Deck and Facilitator Guide

The Young Digital Leaders curriculum consists of four one-hour comprehensive and fully structured sessions. They cover a range of social challenges relating to the online world, including fake news and propaganda, echo chambers, emotional manipulation and hate speech, specifically relating to Italy, Romania and Sweden. Each curriculum has been customised with real-world national examples and translated into the local language by the local partners to ensure relevance and engagement.

This curriculum, in conjunction with an accompanying digital deck and facilitator guide, provides all the information and guidance needed for educators and facilitators to deliver the project:

- key concepts to help facilitators gain insight into the issues discussed in the sessions;
- an outline of how to prepare for success;
- an overview of the activities and timing of each session, its learning outcomes and the required learning materials;
- detailed guidance on how to facilitate each session.

The digital deck provides the facilitator with high quality, interactive multimedia content that chronologically correlates with the session plans.

The facilitator guide provides supplementary guidance on the use of the curriculum and digital deck with young people. It is intended to provide facilitators with the content needed to build digital citizenship and social inclusion skills in young people against sensitive social issues that can often be challenging to discuss in formal and informal educational settings. This guidance serves to give the facilitator confidence in delivering the curriculum and pedagogical approaches contained within it.

Session 1: Digital Literacy

The purpose of Session 1 is to consider contemporary challenges associated with the consumption of media content and discussions on social media, such as how to recognise fake news, distinguish between fact and opinion, and understand online echo chambers, as well as to provide guidance on how young people can respond appropriately to contentious content online.

79%

Of parent participants would recommend the session to parents

79%

Of parent participants are now more likely to discuss online safety

It aims to make participants aware of these issues, more capable of critically consuming media content, and more likely to consume information from a wide range of sources.

Sessions 2 and 3: Online Behaviours

Sessions 2 and 3 explore the impact on young people of consuming information online and using social media, focusing on how the emotions of consumers can be influenced by online content creators. These sessions examine how and why content creators try to take advantage of emotional rather than logical responses to online material, and give young people the skills they need to recognise emotional manipulation. They consider 'us and them' thinking, the role it plays in communities and wider society and how to recognise it, and demonstrate how individuals and societies can flourish through collaboration.

The sessions increase participants' critical awareness of emotional manipulation and appeal to group identity through a balanced series of participatory activities that consider negative and positive aspects of these phenomena.

Session 4: Your Role

Session 4 seeks to increase participants' understanding of what hate speech is and why it is used, and the negative effects hate speech can have on individuals and society as a whole. It examines how young people can respond to hate speech appropriately when they come across it online. Its objective is to leave participants aware of these issues, more capable of recognising hate speech and negative online behaviour, self-aware of their internet use, and more motivated and able to respond appropriately when they encounter hate speech online.

The Parent Guide

A Parent Guide was created to complement the parent engagement sessions and provide a tangible product for parents to take away with them. It outlines the same key definitions on social challenges as used in the student curriculum, and suggests practical ways that parents can help young people to express themselves positively online and deal with online harms and challenges.

> "The sessions increase participants' awareness of emotional manipulation"

4 Evaluation of the Young Digital Leaders Project

This chapter presents the results of our evaluation of the Young Digital Leaders pilot project.

Methodology

This evaluation drew on quantitative and qualitative measurement methods: participant student and comparison group student pre and post surveys designed to measure changes in skills, knowledge, attitudes and behaviours, through a series of confidence-based Likert-scale measures. In the post surveys questions investigated the experiences of participant students.

The sample size of students was 143 for the participant group and 135 for the comparison group. These surveys were complemented by one focus group with eight participating students in each country to provide detailed insights into their experiences of the pilots.

Interviews with two teachers in each country were conducted to gain an understanding of the school and country within which the interventions took place and the subsequent impact of the pilots within this context.

Finally, pre and post surveys designed to measure changes in skills, knowledge, attitudes and behaviours, using similar confidence-based Likert measures, were administered to participant parents. In the post survey questions investigated the impact of the session on parents and their confidence in supporting their children in dealing with online safety challenges.

The sample size of parents was 39. There was one focus group with seven participant parents in each country to further explore these questions.

The full description of our evaluation methodology can be found in the technical appendix of this report.

Demographics

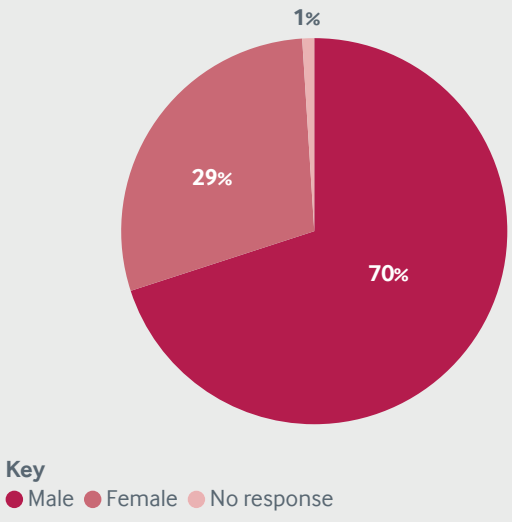
Participants

Demographic details of students and parents who participated in the pilot sessions were collected through the pre surveys. These data are critical to ensure that the project addressed and worked effectively for all in the target audience. This data will be valuable in future iterations of the project, allowing us to adapt and refine the content to ensure equality of outcomes.

Students

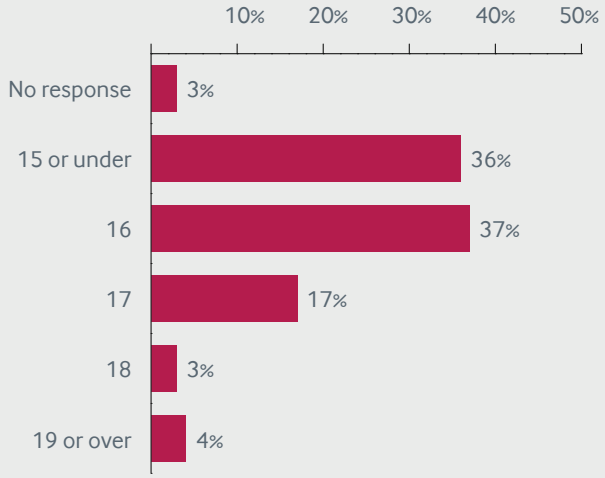
The student demographics suggest that the pilot sessions reached their targeted age group. However the gender distribution across the three countries was notably unbalanced, with a significantly more men participating than women and other: 70% of participants were male, 29% were female and 1% chose 'other' (Figure 1).

Figure 1 The gender of student participants



There was a broad range of ages participating: 73% of participants were aged 13–16, 17% were 17 and 7% were 18 or older (Figure 2). This wide age range might have led to some of the participants who were above the 13–16 age group feeling that the sessions were too basic.

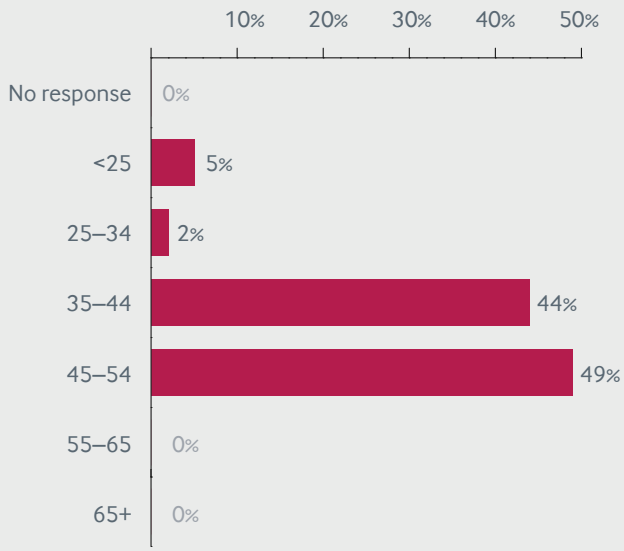
Figure 2 The age of student participants



Parents

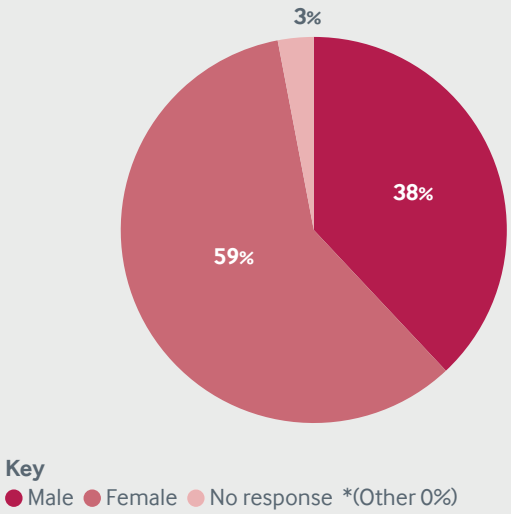
The age range of participating parents was, as expected, much broader than that of the students and demonstrates that the parent sessions reached the anticipated age range in line with the target age of participant students: 93% of the participants were aged between 35 and 54, with the remaining 7% being 34 or under (Figure 3).

Figure 3 The age of parent participants



As with the student demographics, the gender distribution for parents across the three countries was unbalanced: 59% of participants were female, 38% were male and 3% did not state their gender (Figure 4).

Figure 4 The gender of parent participants



The parents were surveyed on the frequency of their own use of the internet and the frequency of their child or children's use of social media. A large majority (97%) of parents reported using the internet more than once a day, with 92% stating that their child or children use social media more than once a day (figures 5 and 6). This demonstrates that the project reached those who use the internet and social media daily, therefore ensuring the content was delivered to an audience for whom digital citizenship training would be highly relevant and necessary.

The participant student data was matched with the corresponding data collected from their parents to understand whether student digital citizenship competencies would be higher for those students whose parents used the internet more frequently than other parents. However, there was no variation among the parents on the questions about internet usage so this hypothesis could not be proved. There were only 18 surveys that matched students with their parents, so it was hard to find variation over those questions with such a limited sample. Future iterations of this evaluation could include a larger sample and more

Figure 5 The frequency of parents' social media use

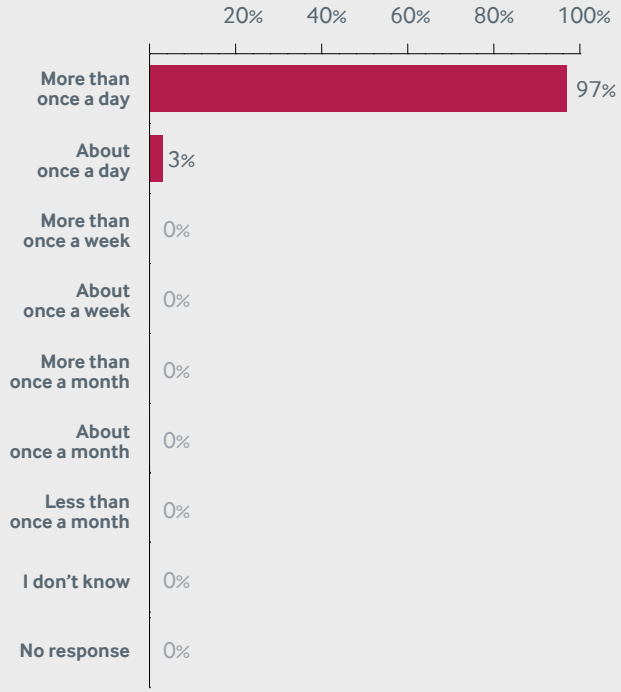
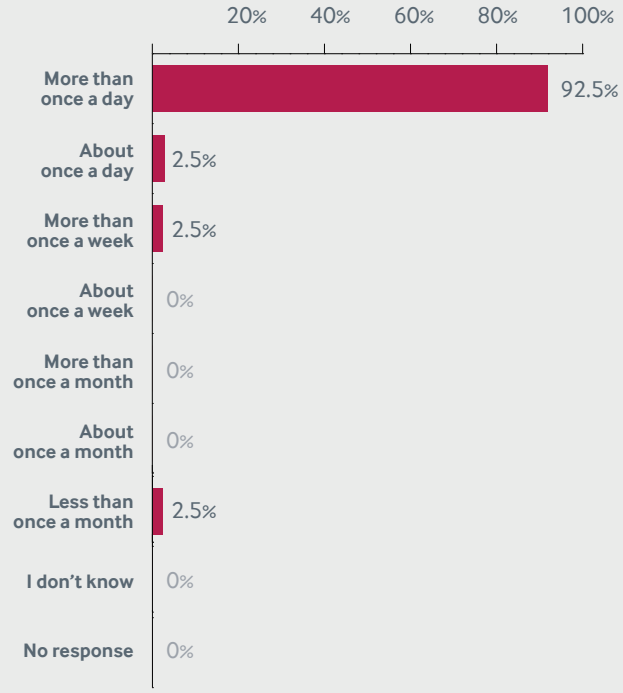


Figure 6 The frequency of children's social media use



options on the survey for internet and social media use, such as more than five times a day or once an hour, to allow for deeper insight to be gained into this area.

Impact Summary for Students

This section presents the key findings of our impact evaluation based on a sample size of 143 participant and 135 comparison group students. The comparison of the pre to post survey change in the student participant and comparison groups demonstrates varying levels of impact across measures, from statistically significant variations, to positive changes that were notable but could not be regarded as statistically significant in this context, to measures that showed no positive change.

Between the pre and post surveys there were statistically significant positive changes in the responses to five impact statements, a statistically significant negative change in response to one impact statement, a notable positive change in response to two impact statements, and no change or no notable change in response to seven impact statements.

There was a statistically significant positive change between pre and post surveys in responses to these five impact statements:

- 'I would know what to do if I came across hate speech online' – agreement among participants increased by 16%.
- 'I understand what "echo chambers" are' – agreement among participants increased by 84%.
- 'I understand what the "filter bubble" is' – agreement among participants increased by 95%.
- 'I would be able to identify "fake news"' – agreement among participants increased by 15%.
- 'I understand what "scapegoating" is' – agreement among participants increased by 32%.

There was a notable positive change between pre and post surveys in responses to these two impact statements:

- 'I know how and why to "flag" or report social media content' – agreement among participants increased by 8%.

- 'I would recognise "us versus them" arguments online' – agreement among participants increased by 23%.

There was a statistically significant negative change between pre and post surveys in the responses to this impact statement:

- 'I feel confident expressing my views online' – agreement among participants increased by –7%.

Thematic Analysis

The impact measures that reported the most success centred on a number of key themes, including increased skills related to overall digital citizenship capacity, media literacy and critical thinking, and understanding of key terminology and concepts relevant to understanding hate online.

Less successful impact measures similarly centred on a number of key themes, including the ability for participants to express views online confidently, and to seek out views and opinions that differ from their opinions online.

It is important to highlight here that it is common for young people to be overconfident when initially reporting their skills levels on a Likert scale, which partly explains some of the higher baseline scores across these measures. This makes the findings that were statistically significant difference even stronger.

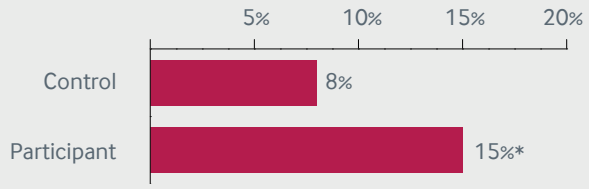
The thematic grouping of the more and less successful elements of the project makes it possible to draw useful insights from these results to improve and refine future efforts. These results are analysed by theme below.

Media Literacy and Critical Thinking

Two of the key themes examined in the workshop were media literacy within the online context and critical thinking about persuasive and manipulative content and individuals. The activities were devised to examine fact checking and responsible sharing of online information, awareness of fake news and biased writing, and emotional manipulation in online content and interactions with individuals.

Statistically significant positive impact was observed in one key measure in this subject area: 85% of participants left confident that they would be able to identify 'fake news'; between pre and post surveys, there was a 15% increase in confidence on average (Figure 7). Going into the workshop 65% of students reported being confident in their ability to identify fake news, demonstrating that this concept was the most familiar to students before the intervention, which explains why the overall increase in knowledge gain was smaller than for some of the other positive measures in this evaluation. One student from Italy reported, 'I knew about fake news before but now I feel more aware of how online content is categorised and it's easier for me to identify different types of situations.' This suggests that the workshops consolidated pre-existing knowledge of this concept, and provided a practical insight into how to recognise and identify the characteristics of fake content online.

Figure 7 Increase in the number of participants who stated they would be able to identify 'fake news' after workshop compared with control group (participants n=143, control group n=135, *p<.05)



For three other measures in this subject area no change among participants pre and post survey was recorded:

- When considering why people post things online, there was no change beyond random variation, with a –1% decrease for the participant group, and a 12% positive change for the comparison group. This may be explained by the small sample size and any number of external confounding variables for which we could not account.
- When asked if they were confident that if they weren't sure a story was true, and they wanted to share it, they would fact check it first, there was no change beyond random variation, with a 0.7% positive

increase for participants and 7% positive change for the comparison group (indicating that the control group may not have been a good comparison for this measure due to some externalities).

- When asked if they recognised when a social media post, article or website is designed to manipulate people emotionally, there was a 0.6% positive increase for participants before and after the pilot.

However, the baseline level of students who recorded confidence in these measures before the workshops was high, with 80% of participants feeling confident they would fact check a story and 67% confident they would recognise emotionally manipulative content before the interventions, growing to 84% and 68% respectively after the pilot.

This suggests that media literacy knowledge, such as the importance of fact checking and knowledge of fake news and emotional manipulation as key content creation techniques, was already high before the pilots. However, it seems that the more complex or technical aspects of these sessions, related to things like identifying the motivations and indicators of emotional manipulation, were less successfully delivered than those that focused on solidifying this knowledge.

Attitudinal Change

No statistically significant change was recorded for three attitudinal measures before and after the workshops. Some two-thirds (65%) of participants reported being happy to listen to people expressing different worldviews from theirs before the workshop, with a 3% increase in overall agreement after the pilot, while the comparison group reported an 8% increase. However, a high participant baseline measure of happiness to listen to different worldviews may account for the small rise on this measure.

Similarly 41% of participants reported that they feel responsible for the wellbeing of people connected to them through social media, an increase of 1% on average, while there was no increase in participants who felt motivated to seek out views and opinions that differ from theirs online (0%), with 42% of participants willing to do this after the workshops. As participant baseline levels were low for this measure, this suggests the lack of positive impact is due to issues with the project content, with more in-depth engagement needed around these hugely important measures of digital citizenship and online behaviours.

While the content focuses on what young people can do when faced with challenges online and had a positive impact on skills-focused measures, there is less of an emphasis on collective online community wellbeing and the practical ways in which those young people can help others as positive digital bystanders. Additionally, the curriculum extensively covers negative online behaviours and worldviews, such as hate speech, which may explain why participants felt less willing to seek out different views from those they already interact with online. In future, expanding the curriculum to have a greater focus on positive yet varied online content and worldviews could bring larger positive attitudinal and behavioural change.

Finally, there was a statistically significant 7% decrease in participants' confidence in expressing their views online, against a 7% increase for the comparison group after the workshops. Again, it could be that the workshops decreased participants' confidence because the curriculum is centred on the varied negative online challenges and harms that young people face, causing participants to feel more cautious with their online interactions in future. While this increased awareness could be a good thing, the goal should be to make young people critical but confident. As these surveys were administered a week after the workshops, a drop in confidence may be expected to start with, however a longitudinal three-month follow-up survey could demonstrate higher confidence once participants have had time to build on and apply their critical behaviour online.

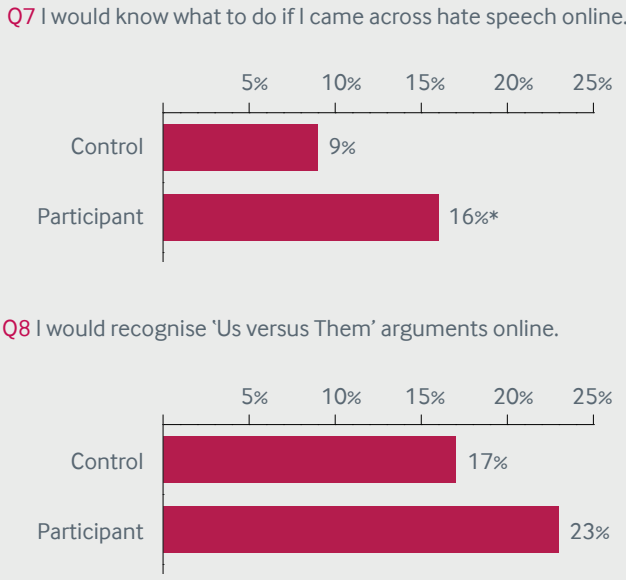
Skills Measures

The results for skills measures (knowing what to do when coming across hate speech online, recognising 'us versus them' arguments) were much more positive than those for attitudinal and behavioural change measures, with some key skills increases after the workshops. However, attitudes and behaviours are more ingrained and thus harder to shift through short-term, one-off interventions.

A statistically significant positive impact of the workshops was observed in one key skills measure: 66% of participants left confident that they would

know what to do if they came across hate speech online, with an average confidence increase of 16%. Similarly, participants' confidence in recognising 'us versus them' arguments online increased by 23% after taking the workshop (Figure 8). As baseline skills levels of participants were low, these increases demonstrate that the workshops have had a highly positive effect in equipping young people with the skills needed when faced with divisive digital harms and challenges.

Figure 8 Increase in the number of participants who would know what to do if they came across hate speech online and would recognise 'us versus them' arguments online after workshop compared with control group (participants n=143, control group n=135, *p<.05)



About three-quarters (74%) of participants were confident they knew how and why to 'flag' or report social media content before the workshop, increasing on average by 8% afterwards. It could not be ascertained whether this increase is statistically significant as there was a 10% increase for the comparison group. Similarly, 71% of participants were confident they understood the differences between hate speech and free speech before the workshop, and 82% afterwards, an average increase of 8%.

The high baseline levels of participants' skills confidence will account for the smaller increases for these two measures. The fact that young people are familiar with social media platforms may explain their pre-existing confidence in being able to flag negative content. Additionally, as mentioned before, it is common for young people to be overconfident when initially reporting their skills levels, which could be another reason for high baseline figures and small increases across these measures.

Finally, insights from teachers and local partners suggest that a reason for this smaller positive impact around hate-speech-related skills is the wider difficulty of defining and distinguishing between hate speech and free speech effectively in wider societies.

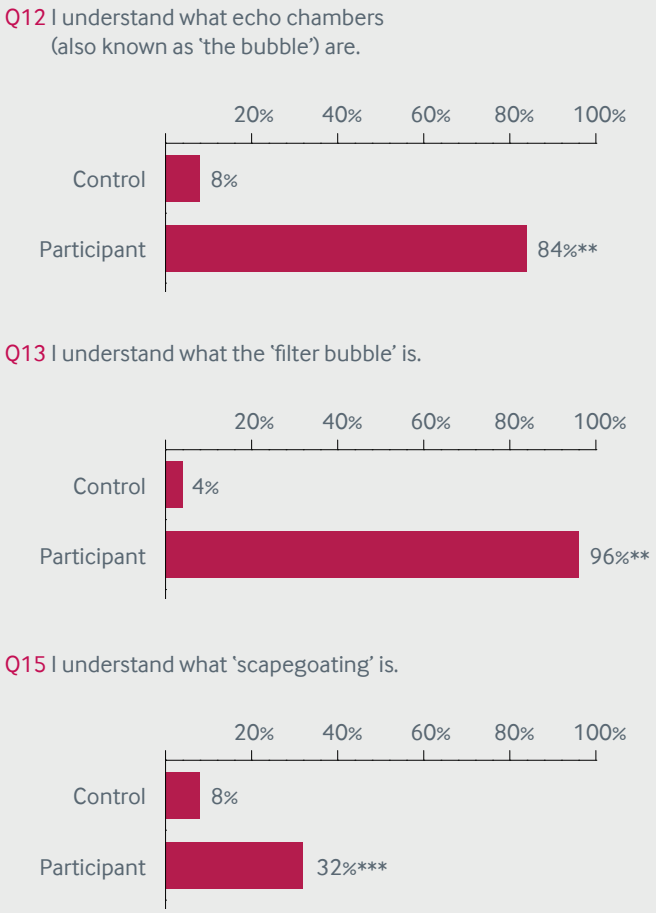
Social Media and Hate

The lessons were most successful in increasing participants' knowledge of and confidence in dealing with critical concepts about the online world which are relevant to hate and polarisation.

There were statistically significant positive increases in three of measures: understanding what 'echo chambers', 'filter bubbles' and 'scapegoating' are (Figure 9). There was an 84% increase in participants' confidence that they understand what 'echo chambers' are, compared with an 8% increase in the comparison group. Similarly, statistically significant positive changes were recorded for participant confidence in their understanding of 'filter bubble' and 'scapegoating', two other concepts critical to understanding the role the online space can play in facilitating hate. Participants' confidence in understanding what a 'filter bubble' is grew by 96%, against a comparison group change of 4%, while participants' confidence in understanding 'scapegoating' increased by 32% against 8% in the comparison group. These large changes in confidence can be explained by a combination of clarity of delivery around these key concepts within the sessions, and on a low initial baseline of participants' understanding, which leaves sufficient room for improvement.

However, despite these huge positive increases in knowledge levels, the overall percentages of participants who left the workshops feeling confident were still relatively low: 50% of participants were confident they knew what echo chambers were, up from 12% before the pilots, 46% were confident they knew what filter bubbles were, up from 8%, and 60% were confident they knew what scapegoating was, up from 39%.

Figure 9 Increase in the number of participants who understood what echo chambers, filter bubbles and scapegoating are after workshop compared with control group (participants n=143, control group n=135, **p<.01, ***p<.001)



While these numbers are markedly higher than the participants' pre-workshop and the comparison group's levels of knowledge, they demonstrate that there is room for improvement in the curriculum and delivery methods of the workshops in order to educate young people on these key terms properly, an understanding of which is a key part of being a digital citizen. These findings suggest the workshop should last longer than one day, as it had been too short a time to address many complex concepts. One student in Romania stated that participants were "very tired at the end of the day. I wanted to pay attention but there was a lot of information which needed to be taken into account so it was a little bit difficult to stay engaged throughout the programme."

Two factors probably account for the smaller positive improvements in impact measures for the comparison group, particularly in relation to understanding what 'echo chambers', 'filter bubbles' and 'scapegoating' are:

- Passing familiarity with the concepts as a result of exposure to the pre survey can have a small effect
- Pre survey exposure to unfamiliar concepts can precipitate conversations around them, with peers or teachers, which increase knowledge confidence before the post survey.

However, these changes were not statistically significant and may simply be due to random variation.

Overall in the impact findings there were fewer significant results among the students, and effect sizes tended to be more modest than in the results of the parents. There are two potential reasons for this:

- Adolescent participants are likely to be less able to gauge their understanding of concepts consistently than adults are. This explains why some results were more modest and potentially accounts for some of the variation observed in the comparison group.
- Student surveys were analysed with a comparison group, while only participating parents completed surveys so the students' results were required to meet a higher threshold of significance.

Given these considerations, it is encouraging that responses to five questions demonstrated that the workshops had a statistically significant, positive impact on participants.

Process Evaluation

The surveys included some process questions asking participants what they thought of the workshops. The three focus groups with students and six interviews with teachers drew out the strengths and weaknesses of the sessions from the perspectives of those being taught and those observing workshops in schools. This section analyses the responses to the process questions.

Participants reported a high level of enjoyment of the workshops: 81% liked the sessions, suggesting that the workshops were engaging and interesting (Figure 10). In the focus groups, several participants emphasised that

Figure 10 Participants' responses to the survey question 'Did you enjoy the workshop?' (n=121)

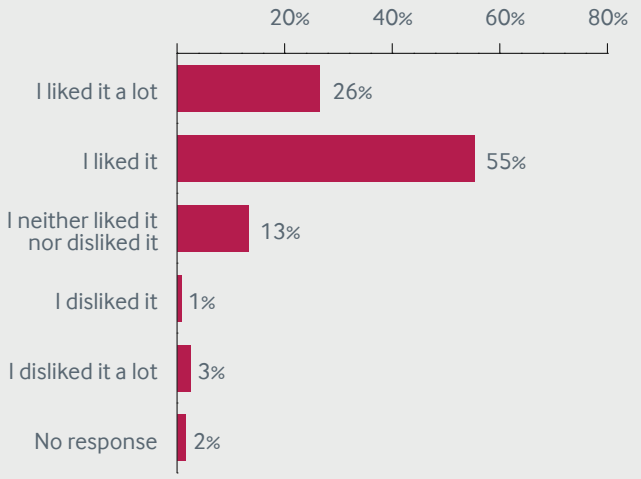
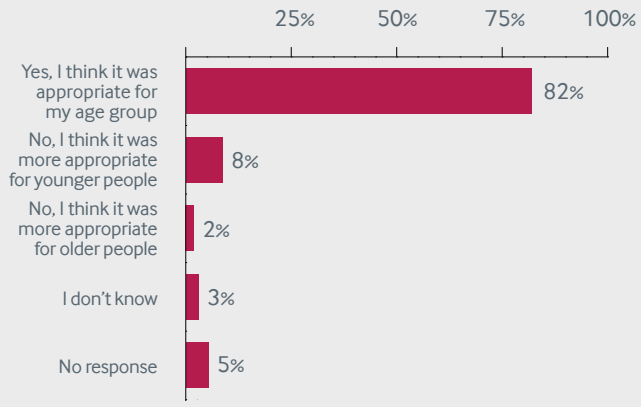


Figure 11 Participants' responses to the survey question 'Do you feel like the workshop was appropriate for your age?' (n=121)

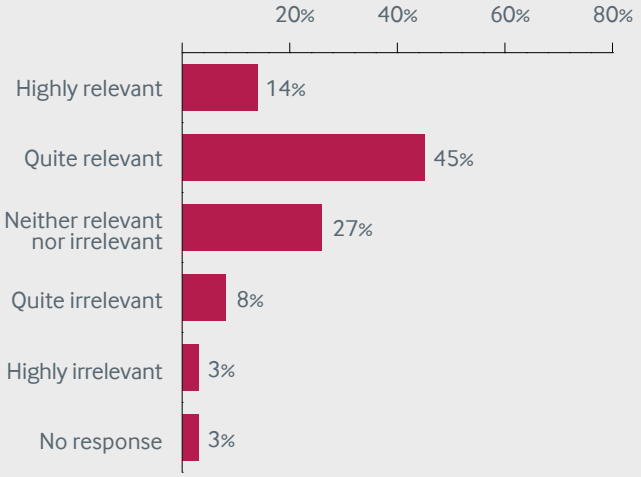


the informal workshop format and interactive learning method made the sessions particularly enjoyable:

> *It was something new to work in teams and to have to answer to challenges on the spot; I think it made me more creative.*
>
> *This is the best thing the school has done for me.*
>
> *The non-formal approach made me feel more relaxed and interested in the topic.*

Participants were asked whether the workshops were appropriate for their age, and whether the content was relevant to them and their lives: 82% thought the

Figure 12 Participants' responses to the survey question 'How relevant do you feel the content of the workshop was to you/your life?' (n=121)



content was age appropriate, and the fact that there were some participants over the original target age range of 13–16 could explain the small number of those who didn't agree with this statement (Figure 11).

While the participants felt the workshops were age appropriate, some in the focus groups thought it was important to educate younger students in digital citizenship as well:

> *A better understanding of the key concepts will be necessary also for the younger students [who] need more of this kind of information because they are in a sensitive period when they can be easily influenced by the online content that they are consuming.*
>
> *This project should go on a national or an international level so that everyone could benefit from it.*
>
> *I think this workshop should address kids that are even younger because when you start using the internet, you tend to behave poorly just to shift the attention towards you, stand out and get your voice heard, no matter your message. So, maybe, when in 5th or 6th grade you should attend a simplified version of the workshop to help you identify the basic ideas of responsible behaviour online.*

A majority (59%) of participants felt the content of the workshop was highly relevant or quite relevant to

Figure 13 Participants' responses to the survey question 'Do you feel like you learned new skills?' (n=121)

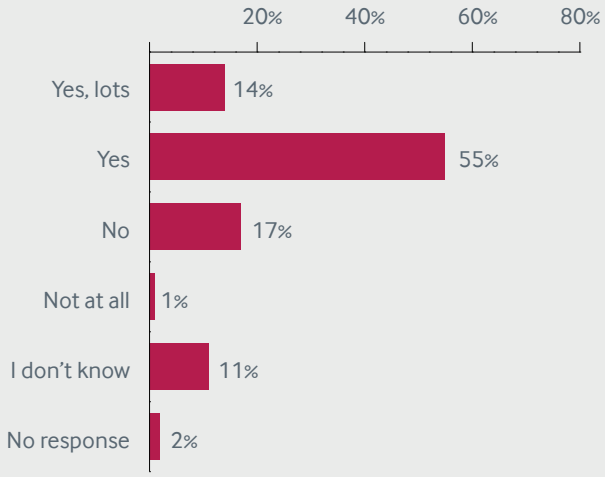
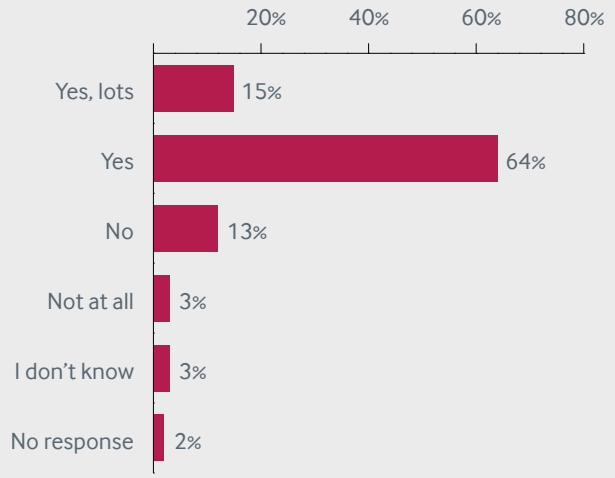


Figure 14 Participants' responses to the survey question 'Do you feel like you gained new knowledge?' (n=121)



them (Figure 12). This suggests that further work can be done to ensure the local examples included in the curriculum and the framing of the key concepts and social challenges are successfully tailored to the young people in each local context.

In the focus groups, participants emphasised that they were not aware of the majority of the concepts of digital literacy going into the workshops, yet these concepts are all relevant to the social media platforms they use regularly:

> *It was very useful, after this workshop I am aware of how much I don't know about online topics and social networks, yet I come across the things we learn about every day.*

> *I was aware that when I liked certain things on Facebook I would receive adverts related to the liked content, but I didn't know I could change anything about it. Now I know about filter bubbles.*

The qualitative and quantitative analyses showed the workshops were particularly successful in improving skills and knowledge gain: 69% of participants reported they had learned new skills in the workshop and 79% felt they had gained new knowledge (figures 13 and 14).

Students in the focus groups thought the interactive workshop format was one of the main reasons they had gained knowledge quickly:

> *I think the structure of the workshop and the fact that we were allowed to talk more helped us learn faster.*

> *I think we would never have learnt all this new information during a class. First of all because it's too new of a subject and classes require a lot of writing and a lot of fast teaching, not interacting.*

This observation was echoed by teachers we interviewed, who emphasised how the collaborative learning techniques used in the sessions helped students learn more within a short timeframe:

> *The format of the programme was very effective and reached its goals, because the kids understood clearly all the new ideas you presented.*

> *I took part in the training where the kids needed to put together a news report... I thought it was really interesting and [it] even made me pay attention and get into the game.*

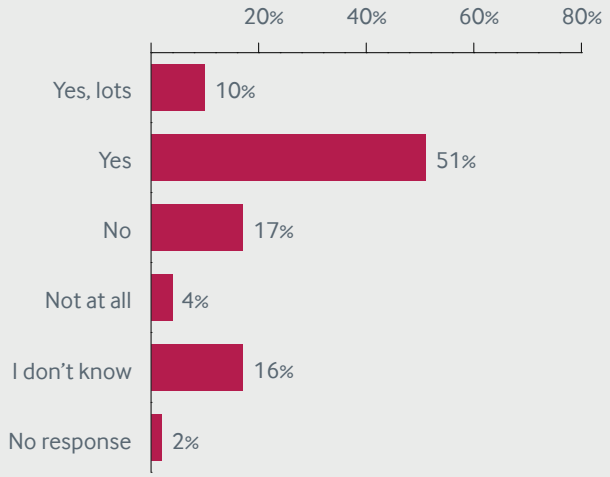
Similarly, the practical and discursive nature of the workshop activities was underlined in the focus groups as a contributing factor towards skills development:

Merging soft skills with hard skills helped us not only develop our knowledge about the online environment but about emotional intelligence, teamwork, combating manipulation too.

I think that because you asked us to answer the questions and you didn't give us the answer, like a teacher would do, you made us really think about our feelings and experiences.

The most important question asked of participants was whether or not they thought that the workshops would influence how they act online (Figure 15). A majority (61%) reported that they would behave differently online after being involved in the Young Digital Leaders project, which is a promising result. While the quantitative measurements of attitudinal and behavioural change were lower, the high proportion of participants stating that the workshops would inspire a change in their online behaviour is encouraging. It suggests that participating in the project had a positive impact on young people's daily lives, one of its key aims.

Figure 15 Participants' responses to the survey question 'Do you think that you'll behave differently online as a result?' (n=121)



In order to influence independent behaviour online, the sessions had to raise awareness or present new perspectives. Some participants in focus groups suggested workshops had been successful in this and explained how their views had changed after attending one:

After the workshop I won't see online ads in the same way, after this session with posters I learnt to see why I like them or not, next time when I will share some ad from H&M or X Factor on Instagram for example I will think about why I want to do it.

The option [to] counter with positivity that was presented to us in the free/hate speech part is something that I haven't thought about before this workshop and I will try to use it more often when I encounter something hateful online.

I came to realise that a filter bubble is a real problem and lets you access only a certain set of information. Maybe I want to know about everything, not only about the things that Facebook thinks I want to know.

However, several participants in focus groups and teacher interviews suggested that knowledge and skills gain and retention would be even more effective if the sessions were embedded within the school curriculum and delivered regularly over a longer period of time:

I was very tired at the end of the day because I really like the activities and wanted to pay attention but there was a lot of information which needed to be taken into account so it was a little bit difficult to stay engaged throughout the programme.

The impact of the sessions could be improved for the students [who] participated in the workshops if there will be regular sessions over the years in which our team can monitor the progress.

Some sort of continuity will motivate and create the digital leaders that their generation needs.

I would like to propose this kind of workshops once per month in every school.

Students and teachers thought it important to build on the positive effect the pilots had by extending digital citizenship education to younger students, embedding the project in the national curriculum across countries and continuing to work collaboratively within the educational ecosystem of students, parents and teachers:

I think this is a programme that should be extended at a national level because, seeing our students and

how excited and willing to learn they were, I realised that this is the situation in all the schools, we don't have enough online education.
(Teacher)

I think your programme should be available as an option in the already existing curriculum, so that students could choose to attend it during the year.
(Student)

To create a longer impact and help the implementation of this type of initiative in the Romanian educational system, [you should] use manuals, flyers and courses that can be accessed by students, teachers and parents.
(Teacher)

Impact Summary for Parents

Our evaluation of the parent sessions is based on a sample size of 39 participants. The comparison of the pre to post survey change in the parent participant group demonstrates varying levels of impact across measures, from changes that were statistically significant, to positive changes that were notable but could not be regarded as statistically significant, to measures that showed no positive change.

There were more statistically significant measures for parents than students. These measures are likely to be even more reliable than those in the student surveys, as adults are typically better at assessing their understanding and knowledge than adolescents. This is hugely encouraging and demonstrates the value of digital citizenship education for parents in addition to students.

Between the pre and post surveys there were statistically significant positive changes in the responses to eight impact statements, notable positive changes in responses to five impact statements, no change or no notable change in responses to two statements, and a negative change in the response to one statement.

There was statistically significant positive change between the pre and post surveys in responses to these eight impact statements:

- 'I understand how hate groups use the internet' – agreement among participants increased by 23%.
- 'I know what practical steps I can take to help my child/children use the internet safely' – agreement among participants increased by 13%.
- 'I feel confident expressing my views online' – agreement among participants increased by 25%.
- 'I feel responsible for the wellbeing of people connected to me through social media' – agreement among participants increased by 18%.
- 'I'm motivated to seek out views and opinions that differ to my own online' – agreement among participants increased by 26%.
- 'I would know what to do if I came across hate speech online' – agreement among participants increased by 35%.
- 'I know how and why to 'flag' or report social media content' – agreement among participants increased by 56%.
- 'I would be able to identify "fake news"' – agreement among participants increased by 23%.

There was a notable positive change between pre and post surveys in responses to these five impact statements:

- 'I am always happy to listen to people expressing different worldviews to my own' – agreement among participants increased by 9%.
- 'I'd know what to say if my child/children asked me questions about online challenges like fake news' – agreement among participants increased by 12%.
- 'If I wasn't sure a story was true, and I wanted to share it, I'd fact check it first' – agreement among participants increased by 11%.
- 'I consider the reasons why people post things online' – agreement among participants increased by 10%.
- 'I understand the differences between hate speech and free speech' – agreement among participants increased by 9%.

Thematic Analysis

As with the student evaluation, the impact measures that were most successful for parents can be analysed through the same key themes, including attitudinal change and increased skills related to supporting the

digital citizenship competencies of their children, as well as overall digital citizenship capacity, media literacy and critical thinking.

Those impact measures that were less successful similarly centred on a number of key themes, including the ability to use the internet confidently and support their children to express themselves positively online.

As the same thematic grouping of the more and less successful elements of the project were used, helpful comparisons can be made between the impacts of the pilots on the students and parents, and insights can be drawn to improve and refine future efforts of engaging with and delivering to parents.

Media Literacy and Critical Thinking

The parent sessions examined media literacy online and critical thinking about emotionally manipulative content and individuals (Figure 16). A statistically significant positive impact was observed in the same key measure in this subject area as with the students: 73% of participants left the workshop confident that they would be able to identify 'fake news', an average increase in confidence of 23% from before the workshop. The reported baseline level of parents' knowledge of fake news before the workshop was 46%, lower than for the students, demonstrating that parents' pre-existing knowledge of this concept was weaker than that of students and explaining the larger shift on this measure for parents. This is extremely positive as it demonstrates that the sessions had a real impact on parents' understanding of less familiar digital concepts.

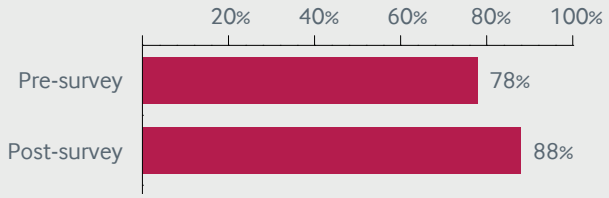
Notable positive change was recorded following the workshop for two other measures in this thematic area:

- 88% of participants left the workshop stating they would fact check a story they wanted to share but weren't sure it was true, an 11% average increase in confidence from before the workshop.
- 69% of participants left the workshop stating they would consider the reasons why people post things online, an average increase of 10% from before the workshop.

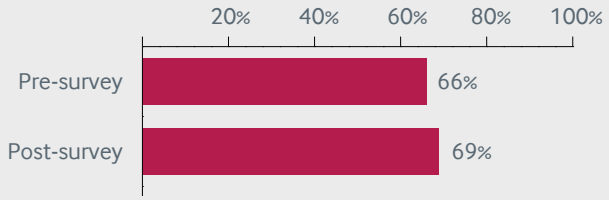
As with students, the baseline level of parents who recorded confidence in these measures before the workshops was high, with 78% of participants confident that they would fact check and 66% of participants stating they would consider the motivations of those posting content online. These high baselines could be accounted for through generational bias: adults are usually less trusting of content online and so are more likely to apply critical thinking skills when using the internet and social media. However, again the larger increases in confidence here compared with the students, on top of existing high levels of baseline literacy, demonstrate the success of the workshops in educating parents on this key theme of digital citizenship.

Figure 16 The number of participants who would fact check stories they didn't know were true before sharing them, consider why people post things online and be able to identify 'fake news' pre and post survey (participants n=39, *p<.05)

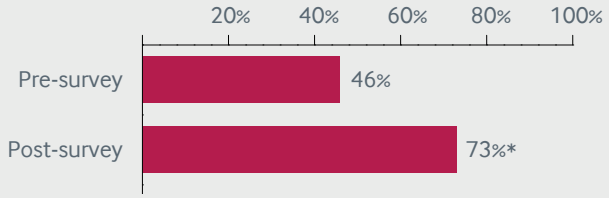
Q10 If I wasn't sure a story was true, and I wanted to share it, I'd fact check it first.



Q11 I consider the reasons why people post things online.



Q16 I would be able to identify 'fake news'.



Attitudinal Change

Across five attitudinal measures, three statistically significant changes and one positive notable change were recorded as a result of the workshops (Figure 17). Given the importance of attitudinal change to strong digital citizenship capabilities, such as how individuals interact with others online and being prepared to seek out worldviews that differ from theirs, these results are highly positive.

After the workshop 48% of participants reported feeling confident in expressing their views online, up from 35% of participants who felt confident in this measure before the workshop. On average, there was a 25% statistically significant increase in confidence overall. This large shift stands in contrast to the 7% decrease in student confidence for this measure, and is particularly promising given the common perception that older generations are generally less confident in using the internet.

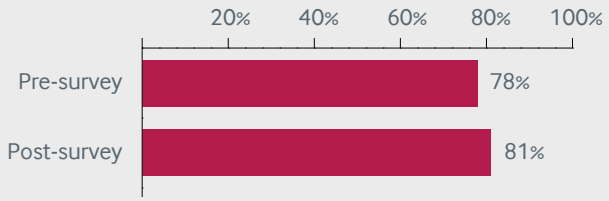
The number of participants who felt motivated to seek out views and opinions that differ from theirs online increased from 69% before the sessions to 75% afterwards, an average increase of 26%. The baseline level was fairly high to start with, but the large statistically significant shift here compared with the 0% shift for students is very positive. Similarly after the workshop 50% of participants reported that they feel responsible for the wellbeing of people connected to them through social media, up from 31% of participants before, an average increase of 18%. Again this statistically significant result is positive compared with the 1% shift for students on this measure.

This data is in line with the notable positive change recorded for parents' confidence in being happy to listen to people expressing different worldviews from theirs, a 9% increase compared with the 3% increase for students after workshops. The baseline level for this measure was high for both students and parents, at 65% and 78% respectively, yet it is highly promising that 81% of parent participants felt confident on this measure after the sessions.

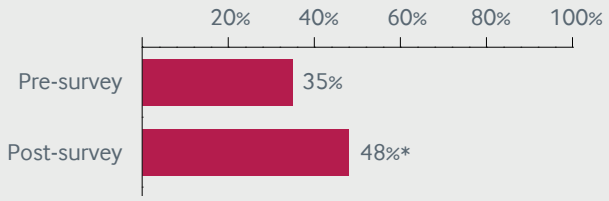
These results indicate that the content and delivery methods used for the parent sessions were more effective in creating impactful attitudinal change than for the student sessions. While it may be that the negative

Figure 17 The number of participants who are happy to listen to people expressing different world views from theirs, feel confident expressing views online, feel responsible for the wellbeing of those with whom they share social media and are motivated to seek out opinions different from theirs pre and post surveys (participants n=39, *p<.05)

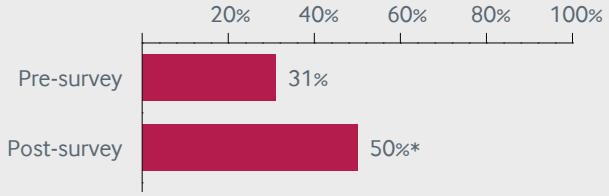
Q7 I am always happy to listen to people expressing different worldviews to my own.



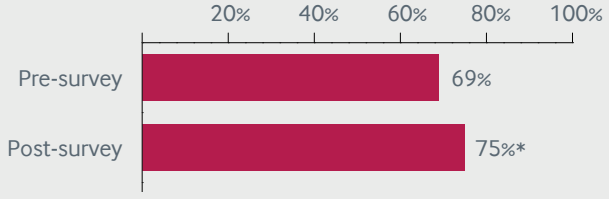
Q8 I feel confident expressing my views online.



Q9 I feel responsible for the wellbeing of people connected to me through social media.



Q12 I'm motivated to seek out views and opinions that differ to my own online.



content in the student curriculum made the students less willing to interact with others' views online, the emphasis in the parent sessions on the need to diversify from one worldview and be a positive bystander when faced with challenges online was clearly well received by participants. In future, increasing the length of the parent sessions from two hours to allow more time for exploring these key messages may serve to increase the number of participants who feel confident with these core digital citizenship competencies.

Finally, when measuring confidence in using the internet, there was no change recorded for parents before and after the workshops. However, the baseline level was high with 78% of participants stating they felt confident in using the internet before the sessions, which may account for the lack of increase on this measure.

Skills Measures

The results for skills measures (knowing what to do when coming across hate speech online, how and why to flag or report social media content and the difference between hate speech and free speech) for parents were as positive as for students following their workshops (Figure 18). Between the pre and post surveys there were statistically significant positive changes for two key measures and a notable positive change in the last measure in this section. Following the workshop 56% of participants were confident they would know what to do if they came across hate speech online, a statistically significant increase of 35% on average compared with their confidence before the workshop. Similarly, 66% of participants were confident they knew how and why to 'flag' or report social media content after the workshop, up from the baseline level of 28% beforehand, a statistically significant increase in confidence of 56% on average.

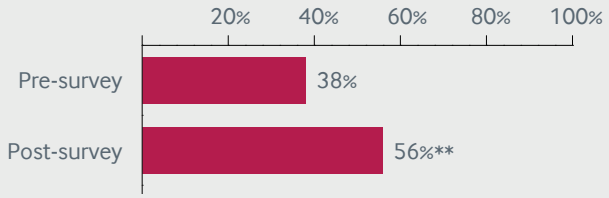
The baseline levels for these measures were low, suggesting the session was successful in demonstrating the ways in which you can respond to hate online. The low baselines suggest that parents were less aware of these skills than students are before the sessions and could explain why the workshops had more effect on them than on students. One parent observed that students "know more about the internet than we do, but we know more about safety than they do".

This, combined with the clear positive impact of the parent sessions, provides strong evidence of the need for and potential effectiveness of adult digital citizenship education. This education would allow parents to develop key technical skills to complement their pre-existing safeguarding knowledge, and is imperative given the high frequency of adult internet use. (See 'Parent Demographics' above.)

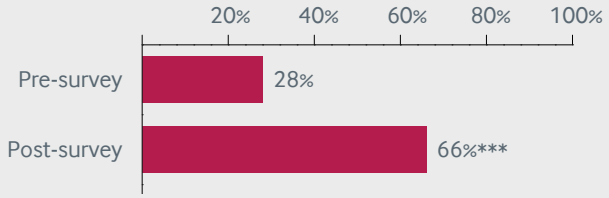
After the workshop there was a 10% increase in the number of parent participants who understood the differences between hate speech and free speech, up from 77% beforehand to 87% afterwards. The adult baseline was higher than that of the students for this measure, which is to be expected as these concepts are historical and existed offline before they were used online.

Figure 18 The number of participants who knew what to do if they came across hate speech online, knew how and why to flag or report social media content and understood the difference between hate speech and free speech pre and post surveys (participants n=39, **p<.01, ***p<.001)

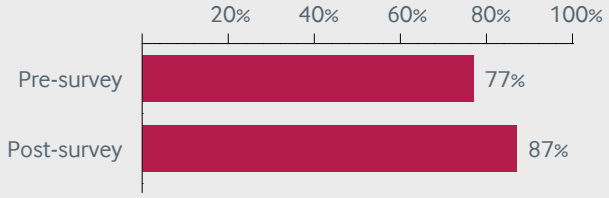
Q13 I would know what to do if I came across hate speech online.



Q14 I know how and why to 'flag' or report social media content.



Q15 I understand the differences between hate speech and free speech.



The findings for this measure contrast with those for more recent online concepts, like fake news, which were more familiar to young people than adults: parents already distinguished hate speech and free speech before the sessions, which may explain the smaller increase for this skills measure.

In addition to measuring the same digital citizenship skills as the students, parents were evaluated on their skills in supporting their children in dealing with online challenges and positive online expression. Parent participants were asked before and after their workshop if they agreed with three impact statements: there was a statistically significant change in response for one, a notable change for one and no notable change for the third.

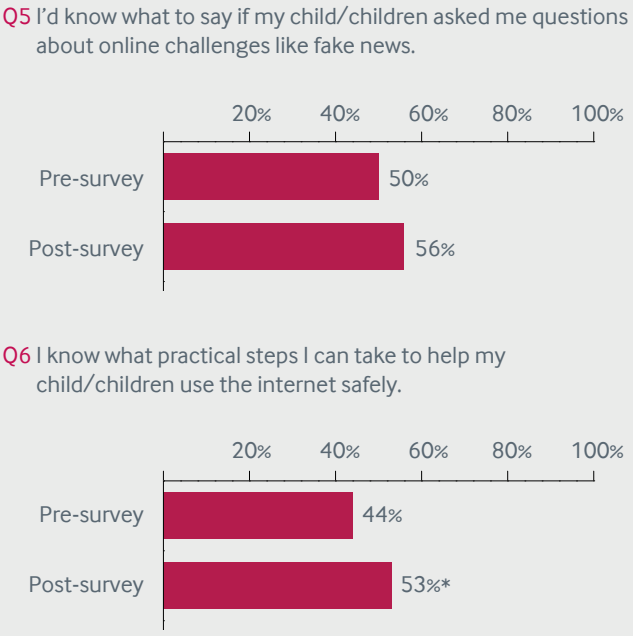
From a low baseline of 50% before the workshop, afterwards 56% of participants left confident they would know what to say if their children asked them questions about online challenges like fake news, an average increase of 12%. Similarly from a baseline of 44% before the workshop, afterwards 53% of participants left confident they knew what practical steps they can take to help their children use the internet safely, a significant average increase of 13%.

The number of participants who felt confident about their ability to support their children in dealing with online challenges and internet safety after the sessions is still relatively low overall (Figure 19). However, the statistically significant increase in confidence demonstrates that the workshops are effective. Extending future iterations of the sessions to longer than two hours may be useful, in order to develop these skills in parents. One parent stated, "More time would have helped us realise all the aspects of your teachings".

Unfortunately it is often difficult for parents to attend even two-hour sessions, though, and attendance at the parent workshops was lower than originally anticipated. It might therefore be valuable to investigate different engagement methods for parents, such as online guidance films and toolkits, for future iterations of the project.

There was no notable change before and after the workshop in the number of parent participants who were confident they could support their children to express

Figure 19 The number of participants who would know what to say to their child(ren) if asked about online challenges and what practical steps to take to help them use the internet safely pre and post surveys (participants n=39, *p<.05)

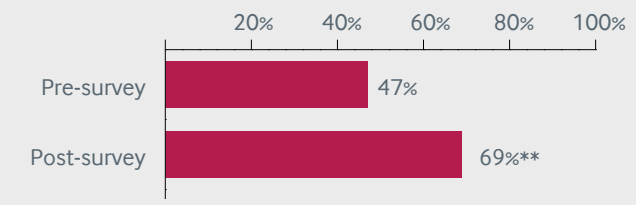


themselves positively online: 78% of participants were confident about this after the sessions, a 4% increase on average from the high baseline of 69%. This figure is high compared with the number of parents pre workshop who were confident they knew how to support their children to use the internet safely (44%) or answer questions on online challenges (50%). This could be because parents are likely to be familiar with encouraging their children to express themselves in a positive way offline, and the other two measures investigated specific and complex challenges around equipping young people to deal with social issues online.

Social Media and Hate

While the students were assessed specifically on their knowledge of the key concepts about the online world related to hate and polarisation, parents were evaluated on two broader measures relating to these terms. A statistically significant positive impact of the workshops was observed in one key measure: 69% of participants were confident they understood how hate groups use the internet after the workshop, up from 47% beforehand, an average increase of 23% (Figure 20). This is a highly

Figure 20 **The number of participants who understood how hate groups use the internet pre and post surveys (participants n=39, **p<.01)**



positive result, given the low baseline of knowledge before the workshop and the multifaceted and complex techniques employed by hate groups online. The strength of the content of the project curriculum is demonstrated in its ability to educate the general population effectively on a specialised issue in two hours.

There was no change in the number of participants who were confident in understanding the challenges young people face online before and after the workshops. However the baseline level was 81%, which probably explains why participating in the workshop had no effect in changing parents' views for this measure. One explanation for this high baseline could be that parents are more likely to be aware of the well-documented safeguarding challenges that the online world poses to their children, but less aware of the solutions or practical skills that can be harnessed to counter them: only 56% of parents would know what to say if their children asked questions about these challenges and 53% know the practical steps they can take to support safe internet use by their children.

Process Evaluation

As with the student surveys, the parent surveys included a number of process questions focusing on parents' views on the sessions and how effective they had been, providing valuable data. Three focus groups with parent participants provided further insights into the strengths and weaknesses of the sessions, and the need for digital citizenship education. This section presents the findings of these surveys and focus groups.

More than three-quarters (77%) of parent participants in the workshops enjoyed them (Figure 21). Although there

Figure 21 **Participants' responses to the survey question 'Did you enjoy the session?' (n=39)**

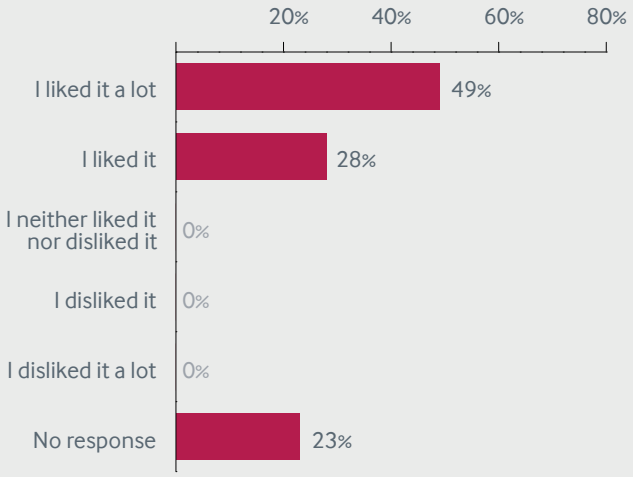
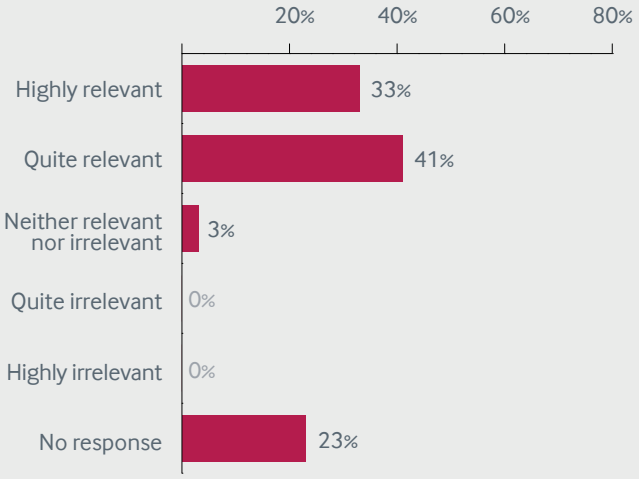


Figure 22 **Participants' responses to the survey question 'How relevant do you feel the content of the session was to you?' (n=39)**



may be some self-selection bias in parents' responses to this question compared with those of students, as parents chose to attend this session whereas students were selected, this result still suggests that the sessions were engaging and interesting for parents. Similarly, 74% of participants felt that the content of the session was relevant or highly relevant to them (Figure 22).

In the focus groups the parents emphasised how the workshops had introduced them to many new concepts they had not been aware of beforehand, which they felt

were important for parents to know about:

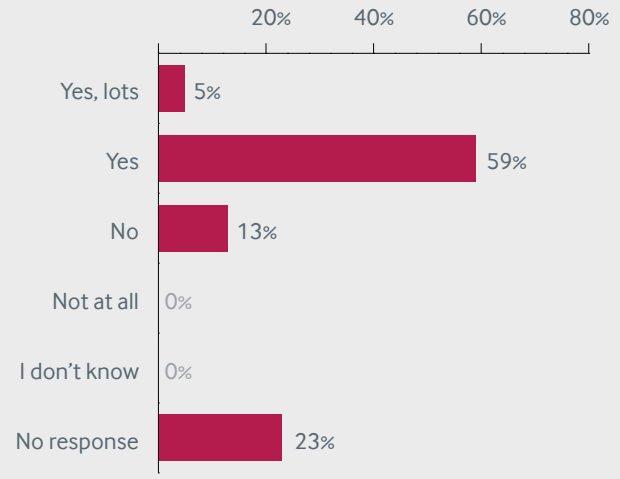
> *Actually, it surprises me! It made me think a lot about something I didn't consider a problem or a danger for my child before.*
>
> *The most interesting concept for me that I didn't realise was a problem online is the 'us versus them' thinking.*
>
> *I can say that emotional manipulation, the activity that you demonstrated, was very impactful for me, because usually we don't think about ads in that way.*
>
> *Before the parent engagement evening I thought I knew everything and I am a little ashamed to admit I only knew about two of the concepts you introduced.*

Some participants stated that the parent sessions were too condensed and felt the need to interact with facilitators over a longer period of time to discuss the concepts in more depth because they felt less literate with these topics and social media:

> *More time would have helped us realise all the aspects of your teachings.*
>
> *I feel less ready to help my daughters now, after your event, than I was before, because I came to realise I know very little about this.*
>
> *I understand the purpose and I welcome this initiative even if it is about the concepts that are including online things and technology that I am not very comfortable with.*
>
> *My greatest problem in raising and educating my kids to behave responsibly online is that they are so much ahead of me, and I just cannot keep up with all the apps and social media that they are using.*

Parent participants thought the sessions would have a significant impact on their future online behaviour and future parenting skills in dealing with online safety challenges, echoing the value they gave to the information imparted attitudinal and skills change recorded for parents. Nearly two-thirds (64%) of parents said they would behave differently online as a result of the workshops dealing with attitudinal change and skills in addressing online challenges (Figure 23). This demonstrates the value of the project for parents, similar to its value for students (see 'Attitudinal change', above).

Figure 23 **Participants' responses to the survey question 'Do you think that you'll behave differently online as a result?' (n=39)**



A similarly positive trend is that 69% of parents felt more able to help their children deal with online safety challenges and 79% of parents were more likely to have a conversation with their children about online safety following these sessions (figures 24 and 25). This complements the positive skills increases found after participating in workshops in the quantitative analysis.

In order to increase parents' independent online behaviour and develop their parenting skills the sessions had to raise awareness of new perspectives and provide tangible examples of how to provide practical support. Some in the focus groups spoke about this:

> *The first step in solving the problem is approaching it, things we didn't do up until we interacted with your programme.*
>
> *We never thought about this as being a serious problem, and we didn't take into account the risks our kids were facing.*
>
> *It is very hard to control the content which children are exposed to online; activities like this that aim to educate the children are the best we can do to assure that they will make the right choices online.*

Figure 24 Participants' responses to the survey question 'Do you feel more or less able to help your child/children deal with online safety challenges?' (n=39)

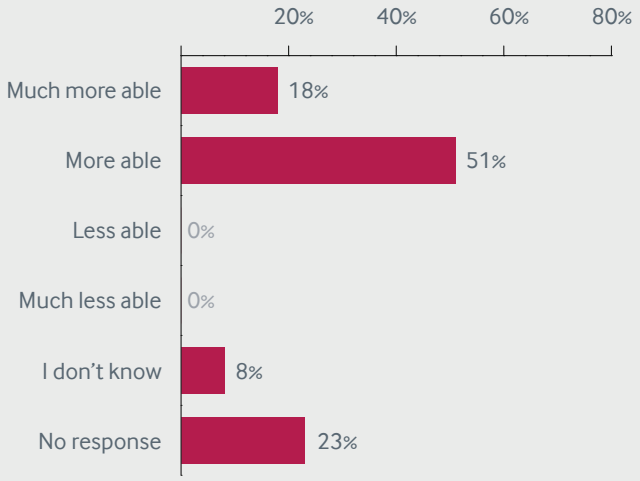
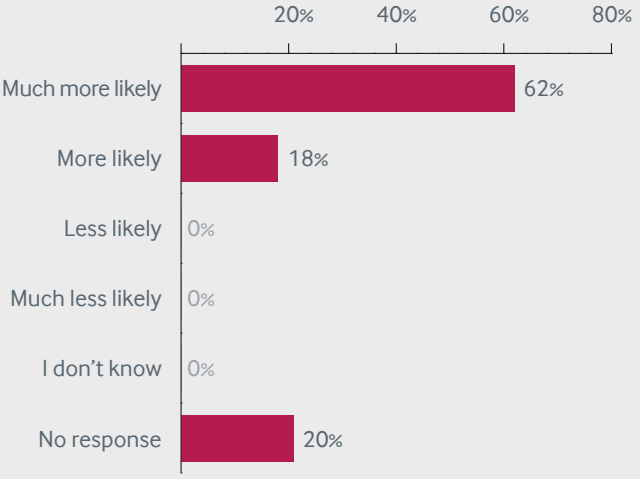


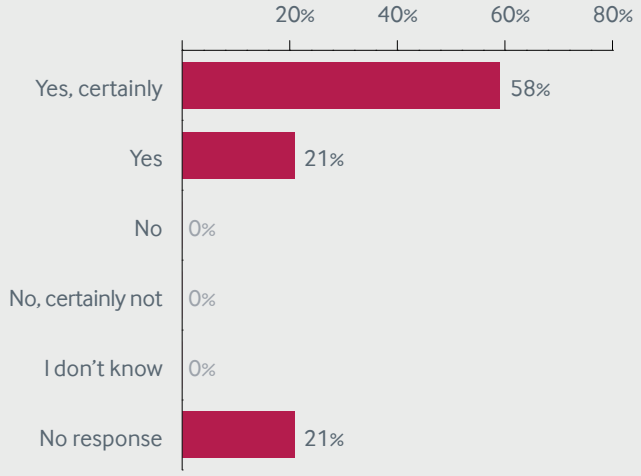
Figure 25 Participants' responses to the survey question 'Are you more or less likely to have a conversation with your child/children about online safety as a result of this session?' (n=39)



Another notable observation that came out of the parent focus groups, as with the student and teacher testimonies, was the importance of continuing and extending this digital citizenship education nationally by harnessing our unique collaborative partnership model, within which parents, teachers and students work with and learn from each other.

A large majority (79%) of participants would recommend these sessions to other parents (Figure 26),

Figure 26 Participants' responses to the survey question 'Would you recommend this kind of session to other parents?' (n=39)



and several emphasised they should be available to teachers, parents and younger and older students:

Everyone should access this programme, even my father who is 70 and is prone to making mistakes online.

Parents and teachers need this kind of education as well.

I think your project reaches its target easier because teachers and parents are perceived as people that impose restrictions and give orders, whereas you are collaborating with them, getting into an uncensored, open conversation with the kids.

The students could become the facilitators, one day, if by listening to your examples and coming up with even more they will learn the ideas you wanted to transmit.

Some participants suggested that everyone who is closely involved with young people should have comprehensive and collaborative digital citizenship education. Students and teachers wanted to embed this project in the national curriculum, and some in the parent focus groups agreed:

You should do this at a national level, not just local.

It should appear in the curriculum as a mandatory activity, but not graded.

5 Conclusions

Key Outcomes

The project had positive results in improving fundamental digital citizenship capacities among students, especially increasing their digital skills and knowledge.
The greatest positive impacts of the project were observed in two areas. First, key digital citizenship skills of those participating improved. For example, after the workshops the confidence of participants in knowing what to do if they came across hate speech online increased by 16%, and their confidence that they would be able to recognise 'us versus them' arguments online increased by 23%. Second, confidence in dealing with critical online concepts relevant to hate and polarisation among those who participated in the workshops increased, for example in understanding what echo chambers are (by 84%) and what filter bubbles are (by 96%). The students were highly positive that they had gained new skills and knowledge.

The informal workshop format and interactive, collaborative learning method was popular with student participants, who gained new knowledge and skills fast within a short timeframe.
Both the student focus groups and teacher interview data from the evaluation suggested that the practical and discursive nature of the workshop activities kept student participants engaged and focused, achieving higher impact than more traditional, individual pedagogies. The collaborative nature of the teamwork activities was emphasised as particularly key to delivering a full and impactful curriculum successfully within a short timeframe.

There were positive impacts across vital digital citizenship measures for parents, spanning media literacy, attitudinal change and skills and knowledge gain, demonstrating the need for and effectiveness of adult digital citizenship education.
The project had successful outcomes for key digital citizenship capabilities for parents. Media literacy improved: there was a 23% increase in parent confidence that they could identify fake news after the workshop. Across five attitudinal measures, three statistically significant changes and one positive notable change were recorded following the workshops, such as a 25% increase in parents' confidence in expressing their views online. The sessions developed media literacy, attitudinal change, key digital skills and digital knowledge. After attending workshops there was a 35% increase in parents' confidence that they would know what to do if they came across hate speech online, and a 23% increase in their confidence that they understood how hate groups use the internet. This evaluation demonstrates the need for specialised adult digital citizenship education, and shows that the workshops had demonstrable success within just two hours when addressing a complex issue.

This evaluation shows that adult digital citizenship education is both essential for and valuable in developing key digital safeguarding skills for parents to complement pre-existing offline safeguarding knowledge.
The sessions were successful in developing key parenting skills: supporting children as they deal with online challenges and positive online expression. After attending workshops there was a 13% increase in parents' knowledge of the practical steps they can take to help their children use the internet safely, and a 12% increase in their confidence that they would know what to say if their children asked them questions about online challenges. After the sessions, 69% of parents felt more able to help their children deal with online safety challenges and 79% were more likely to have a conversation with their children about online safety. This provides strong evidence that this education was effective in developing practical parenting skills that can be harnessed to counter online safety challenges.

> "The practical and discursive nature of the workshop activities kept student participants engaged"

Areas for Improvement

The workshops had no significant positive effects on attitudinal change among students who participated in them, suggesting that session modules on these hugely important measures of digital citizenship should be revised.

The pre and post surveys showed the workshops had no significant or notable positive impact on students' attitudes to feeling responsible for the wellbeing of others on social media or being motivated to seek out views and opinions different from theirs online. One reason for this is that there is little emphasis in the curriculum on collective online community wellbeing and the practical ways in which young people can become positive digital bystanders. The sessions disproportionately focus on negative online behaviours and worldviews, such as hate speech. In future, if the curriculum expanded and considered more positive and varied online content and worldviews, the sessions might have a greater effect in encouraging positive attitudes and behaviour online among students.

Student knowledge and skills gain and retention would be even more effective if the sessions were embedded within national curricula and delivered regularly over more than two hours to a wider age group.

While the impact indicators relating to social media knowledge gain and key skills development after attending workshops were positive, a consistent theme of the student and teacher qualitative evaluation was that there is room for improvement in the delivery format of these workshops. A full day of workshop delivery was tiring and too short a timeframe within which to educate young people properly on complex concepts. In future the project should be delivered through shorter sessions over more than one day. It is crucial to extend digital citizenship education to younger students because the age at which children start to use the internet has decreased. Students and teachers felt that embedding this project within national curricula would allow for greater uptake of the sessions within formal education settings, fulfilling the need for there to be high-level digital citizenship education across Europe.

The efficacy of adult digital citizenship education would increase and engagement levels with parents would be even higher and more successful through a different delivery method.

This evaluation of this project demonstrates the need for and success of digital citizenship education for parents. Yet both the quantitative and qualitative analysis show that increasing the amount of engagement with parents would allow more time to explore core digital citizenship competencies and vital safeguarding guidance that were previously unknown to them. While the obvious iteration would be to increase the length and frequency of the parent sessions, the pilots demonstrated the difficulty in finding a suitable time to hold them, and as a result overall attendance was much lower than had been anticipated. In future, different engagement methods will be used to encourage further reach and greater uptake of this necessary adult education.

> "Student knowledge and skills gain and retention would be even more effective if the sessions were embedded within national curricula"

There is a long-term need for comprehensive and collaborative digital citizenship education across the groups in societies that are the closest to and most influential with young people.

This project demonstrated the importance of digital citizenship education for secondary school students aged 13–16 and their parents, but participants feeding back from the evaluation emphasised the need to extend the Young Digital Leaders partnership model by training teachers and older peer groups to deliver sessions to students as well. Harnessing and upskilling those who are most influential in developing the capabilities of young people is a vital step in embedding digital citizenship education within our societies successfully.

6 Technical Appendix

The data used to evaluate the impact of this project was gathered in pre and post surveys across all three countries (Italy, Romania and Sweden). Surveys were delivered to project participants (intervention group) and non-participants (comparison group) at the same schools. Due to an issue with survey delivery in Sweden, surveys were only completed by project participants. Pre and post surveys were given to parents of participating children, who had attended the parent sessions.

Student Data

Surveys gathered basic demographic data (on gender, age, birth country, language spoken at home, etc.), as well as measures of knowledge and confidence about the key concepts of the project. There were 15 Likert-scale confidence questions and three knowledge questions. Data were then cleaned and coded.
Table 1 shows a summary of the responses by students to 15 questions, by control and participant groups.

Analysis

Results from the pre surveys were compared across intervention and control groups to ensure groups were comparable, with the following results:

- Of the 15 Likert-scale questions, in the response to only one question (Q11) was there a statistically significant difference between the intervention and the control groups (p=0.003), so this question was discarded.
- As data were Likert-scale questions, ordinal (logit) regression was used to analyse the 14 questions where the control group served as a reliable comparison. Two models were constructed:
- a simple model – a basic model with the intervention variable and pre scores used as independent variables, and the post scores as dependent variables
- a complex model – as simple model, with country of analysis, gender, country of birth, language spoken at home and parent's birthplace as additional independent control variables.
- In the body of this report any references to statistical significance indicate that both the model and the intervention variable were statistically significant at the p<.05 level.

As the simple model provided more robust results, we preferred this model in our analysis. Full results of the analyses are presented overleaf.

Simple Model

Table 2 shows the model fit, Pearson and Pseudo R2 indices for the simple model.

Table 2 Model fit, Pearson and Pseudo R2 indices for the simple model

	Model Fit (p)	Pearson (p)	Pseudo R2 (Nagelkerke)
Q1	.000	.596	.206
Q2	.000	.312	.161
Q3	.000	.104	.178
Q4	.000	.170	.143
Q5	.007	.192	.078
Q6	.000	.153	.131
Q7	.001	.523	.096
Q8	.000	.769	.213
Q9	.000	.023	.119
Q10	.000	.127	.127
Q11	-	-	-
Q12	.000	.518	.184
Q13	.000	.645	.180
Q14	.001	.229	.100
Q15	.000	.020	.153

Table 1 **Summary statistics of responses to 15 questions by students, by control and participant groups**

		Mean			Median	
		Pre survey	Post survey	Change	Pre survey	Post survey
Q1	Control	4.85	5.25	8.17%	5	5
	Participant	5.01	5.14	2.57%	5	5
Q2	Control	4.63	4.96	7.02%	5	5
	Participant	4.73	4.39	-7.08%	5	4
Q3	Control	4.04	4.33	7.24%	4	5
	Participant	4.05	4.10	1.32%	4	4
Q4	Control	5.26	5.65	7.47%	6	6
	Participant	5.76	5.80	0.63%	6	6
Q5	Control	3.99	4.47	11.99%	4	5
	Participant	4.16	4.12	-1.09%	4	4
Q6	Control	3.86	4.12	6.86%	4	4
	Participant	3.94	3.94	0.03%	4	4
Q7	Control	4.16	4.52	8.53%	4	5
	Participant	4.30	4.97	15.61%	4	5
Q8	Control	5.03	5.55	10.32%	5	6
	Participant	5.00	5.41	8.25%	5	6
Q9	Control	3.98	4.67	17.41%	4	5
	Participant	4.00	4.92	23.00%	4	5
Q10	Control	5.03	5.16	2.59%	6	6
	Participant	5.06	5.10	0.63%	5.5	5
Q11	Control	5.45	5.49	0.75%	6	6
	Participant	5.16	5.59	8.46%	6	6
Q12	Control	2.38	2.57	8.10%	2	2
	Participant	2.31	4.25	84.12%	2	4
Q13	Control	2.46	2.55	3.62%	2	2
	Participant	2.15	4.20	95.57%	2	4
Q14	Control	4.94	5.35	8.25%	5	6
	Participant	4.90	5.63	15.00%	5	6
Q15	Control	3.82	4.11	7.63%	4	5
	Participant	3.66	4.83	31.83%	4	5

Parameter Estimates

Table 3 displays selected outputs of the ordinal regressions for each question. Post 1 to Post 7 are the categories of the dependent variable for each question (derived from the 1–7 Likert scale for each question). Participant and Control are the categories of the intervention (independent variable). Pre 1 to Pre 7 are the categories of the independent variable for each question.

Table 3 Parameter estimates for questions 1–15 in the simple model

	Q1		Q2		Q3		Q4		Q5	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-5.992	.000	-4.106	.000	-4.225	.000	-4.781	.000	-3.740	.000
Post 2	-5.501	.000	-3.010	.000	-2.922	.000	-3.917	.000	-2.834	.000
Post 3	-4.230	.000	-2.058	.000	-2.096	.000	-2.971	.000	-1.903	.000
Post 4	-2.866	.000	-1.201	.000	-1.268	.000	-2.270	.000	-1.097	.004
Post 5	-1.909	.000	-.506	.066	-.245	.477	-1.289	.000	.117	.752
Post 6	-.527	.178	.701	.013	.615	.079	-.184	.430	1.309	.001
Post 7	.	.	.	.	.	.	.	.	.	.
Participant	-.243	.352	-.743	.001	-.308	.178	.016	.948	-.372	.108
Control	0	.	0	.	0	.	0	.	0	.
Pre 1	-2.700	.005	-1.367	.011	-3.043	.000	-2.878	.000	-1.049	.048
Pre 2	-2.304	.005	-1.453	.002	-1.805	.000	-1.745	.005	-1.819	.000
Pre 3	-2.971	.000	-1.477	.000	-1.687	.000	-1.440	.000	-1.284	.003
Pre 4	-2.545	.000	-1.101	.002	-1.315	.001	-1.532	.000	-.919	.027
Pre 5	-2.044	.000	.085	.822	-.971	.026	-1.400	.000	-.654	.129
Pre 6	-1.543	.001	.078	.833	-.510	.256	-.294	.360	-.482	.330
Pre 7	0	.	0	.	0	.	0	.	0	.

	Q6		Q7		Q8		Q9		Q10	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-3.212	.000	-3.590	.000	-4.394	.000	-3.808	.000	-3.931	.000
Post 2	-2.136	.000	-2.553	.000	-3.553	.000	-2.519	.000	-3.108	.000
Post 3	-1.348	.000	-1.870	.000	-2.965	.000	-2.129	.000	-2.694	.000
Post 4	-.593	.081	-1.085	.001	-2.066	.000	-1.213	.000	-1.871	.000
Post 5	.292	.388	-.327	.289	-1.067	.000	-.227	.491	-1.027	.000
Post 6	1.506	.000	.754	.016	-.193	.448	.918	.006	.158	.565
Post 7	.	.	.	.	.	.	.	.	.	.
Participant	-.213	.349	.483	.042	.048	.841	.295	.203	-.130	.616
Control	0	.	0	.	0	.	0	.	0	.
Pre 1	-1.744	.000	-1.407	.004	-2.209	.000	-1.573	.000	-1.848	.000
Pre 2	-1.352	.002	-1.512	.001	-3.313	.000	-1.712	.000	-1.596	.002
Pre 3	-1.437	.001	-.989	.021	-1.760	.000	-1.254	.004	-.889	.113
Pre 4	-.857	.053	-1.240	.001	-.230	.549	-.707	.083	-1.765	.000
Pre 5	-.316	.467	-1.160	.006	-1.081	.004	-.656	.119	-1.160	.002
Pre 6	.142	.757	-.227	.614	-.327	.367	.175	.714	-.984	.007
Pre 7	0	.	0	.	0	.	0	.	0	.

	Q11		Q12		Q13		Q14		Q15	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-	-	-.875	.168	-.208	.763	-3.879	.000	-2.463	.000
Post 2	-	-	-.388	.539	.250	.716	-3.644	.000	-2.002	.000
Post 3	-	-	.070	.912	.719	.298	-2.839	.000	-1.449	.000
Post 4	-	-	.615	.331	1.210	.081	-1.713	.000	-.956	.002
Post 5	-	-	1.221	.056	1.620	.020	-.643	.017	-.395	.193
Post 6	-	-	2.045	.002	2.237	.002	.551	.039	.526	.084
Post 7										
Participant	-	-	1.490	.000	1.422	.000	.465	.047	.717	.003
Control	-	-	0	.	0	.	0	.	0	.
Pre 1	-	-	-1.193	.068	-.678	.344	-.916	.088	-2.104	.000
Pre 2	-	-	-.809	.236	-.136	.856	-1.711	.001	-1.190	.005
Pre 3	-	-	-.208	.768	-.199	.794	-1.406	.001	-1.555	.002
Pre 4	-	-	-.490	.526	.221	.781	-.813	.032	-.788	.072
Pre 5	-	-	-.530	.492	.890	.295	-.593	.113	-1.256	.005
Pre 6	-	-	-.595	.504	.145	.873	-.119	.732	-.498	.270
Pre 7	-	-	0	.	0	.	0	.	0	.

Complex Model

Table 4 shows the model fit, Pearson and Pseudo R2 indices for the complex model.

Table 4 Model fit, Pearson and Pseudo R2 indices for the complex model

	Model Fit (p)	Pearson (p)	Pseudo R2 (Nagelkerke)
Q1	.000	.028	.225
Q2	.000	.000	.201
Q3	.000	.209	.269
Q4	.000	.510	.165
Q5	.001	.000	.150
Q6	.000	.002	.216
Q7	.002	.181	.143
Q8	.000	.461	.236
Q9	.000	.002	.229
Q10	.000	.051	.362
Q11	-	-	-
Q12	.000	.773	.228
Q13	.000	.158	.294
Q14	.000	.000	.182
Q15	.000	.000	.202

Parameter Estimates

Table 5 displays selected outputs of the ordinal regressions for each question. These are the variables:

- Post 1 to Post 7 are the categories of the dependent variable for each question (derived from the 1–7 Likert scale for each question).
- Participant and Control are the categories of the intervention (independent variable).
- Romania, Italy and Sweden are control variables for the three countries of delivery.
- Gender N/R (no response), Male, Female and Other are gender categories.
- Born in country and Born abroad show whether the participant was born in the country or abroad.
- Majority and Minority show whether the language spoken at home is a majority (Romanian, Italian and Swedish) or minority language of the country.
- Parent born in country and Parent born abroad show whether the parent was born in the country or abroad.
- Pre 1 to Pre 7 are the different categories of the independent variable for each question.

Table 5 Parameter estimates for questions 1–15 in the complex model

	Q1		Q2		Q3		Q4		Q5	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-6.200	.000	-2.909	.030	-4.144	.003	-4.465	.002	-3.670	.009
Post 2	-5.707	.000	-1.802	.172	-2.764	.050	-3.582	.013	-2.727	.051
Post 3	-4.425	.003	-.833	.527	-1.861	.186	-2.630	.066	-1.739	.213
Post 4	-3.039	.039	.046	.972	-.956	.495	-1.920	.177	-.881	.527
Post 5	-2.069	.159	.768	.560	.140	.920	-.928	.513	.399	.774
Post 6	-.667	.648	2.020	.126	1.032	.460	.196	.890	1.625	.245
Post 7	.	.	.	.	.	.	.	.	.	.
Participant	-.235	.386	-.890	.000	-.370	.119	-.003	.991	-.504	.036
Control	0	.	0	.	0	.	0	.	0	.
Romania	.390	.636	-.395	.608	-2.051	.010	-.492	.544	.910	.256
Italy	.810	.310	-.408	.584	-.867	.263	-.471	.556	.148	.847
Sweden	0	.	0	.	0	.	0	.	0	.
Gender N/R	-.924	.640	1.756	.337	.289	.873	.176	.923	.141	.938
Male	-.954	.442	1.309	.252	1.156	.317	.100	.933	-.592	.608
Female	-.448	.721	1.105	.337	1.560	.179	.045	.970	-.142	.903
Other	0	.	0	.	0	.	0	.	0	.
Born in country	.055	.934	.529	.278	-.118	.813	.637	.207	.568	.249
Born abroad	0	.	0	.	0	.	0	.	0	.
Majority	-.003	.996	1.057	.022	.885	.049	-.037	.939	.819	.070
Minority	0	.	0	.	0	.	0	.	0	.
Parent born in country	-.099	.843	-1.068	.015	-.341	.424	.328	.465	-1.363	.002
Parent born abroad	0	.	0	.	0	.	0	.	0	.
Pre 1	-2.705	.010	-1.746	.002	-2.970	.000	-2.875	.000	-.965	.073
Pre 2	-2.075	.013	-1.480	.002	-1.769	.000	-1.750	.008	-1.672	.001
Pre 3	-2.896	.000	-1.480	.000	-1.680	.000	-1.501	.001	-1.099	.015
Pre 4	-2.486	.000	-1.117	.002	-1.388	.001	-1.497	.001	-.825	.049
Pre 5	-1.941	.000	.091	.812	-1.034	.021	-1.396	.001	-.451	.296
Pre 6	-1.394	.002	.050	.895	-.594	.195	-.344	.291	-.377	.450
Pre 7	0	.	0	.	0	.	0	.	0	.

Table 5 (cont.) **Parameter estimates for questions 1–15 in the complex model**

	Q6		Q7		Q8		Q9		Q10	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-3.756	.007	-5.265	.000	-4.774	.002	-3.755	.010	-22.931	.000
Post 2	-2.637	.055	-4.210	.004	-3.902	.011	-2.338	.109	-21.955	.000
Post 3	-1.808	.186	-3.512	.014	-3.287	.031	-1.912	.189	-21.450	.000
Post 4	-.984	.471	-2.712	.058	-2.363	.119	-.928	.523	-20.460	.000
Post 5	-.017	.990	-1.932	.176	-1.348	.372	.137	.925	-19.416	.000
Post 6	1.253	.360	-.808	.570	-.464	.758	1.361	.348	-18.007	.000
Post 7	.	.	.	.	.	.	.	.	.	.
Participant	-.140	.552	.593	.016	.064	.795	.468	.053	.296	.277
Control	0	.	0	.	0	.	0	.	0	.
Romania	1.150	.137	.343	.678	-.106	.903	1.630	.049	-.386	.662
Italy	.855	.250	.301	.709	.181	.826	1.615	.043	-1.767	.035
Sweden	0	.	0	.	0	.	0	.	0	.
Gender N/R	.951	.599	-1.101	.556	2.261	.246	-.872	.636	-19.277	.000
Male	-.438	.702	-1.208	.333	-.198	.880	-2.138	.076	-19.540	.000
Female	.210	.855	-1.024	.413	-.124	.924	-2.112	.081	-19.606	.
Other	0	.	0	.	0	.	0	.	0	.
Born in country	.017	.972	-.707	.157	-.734	.171	-.203	.674	.278	.681
Born abroad	0	.	0	.	0	.	0	.	0	.
Majority	-1.530	.001	-1.078	.020	.652	.173	-.192	.672	.309	.585
Minority	0	.	0	.	0	.	0	.	0	.
Parent born in country	.208	.620	.851	.050	-.108	.814	1.474	.001	1.375	.008
Parent born abroad	0	.	0	.	0	.	0	.	0	.
Pre 1	-1.935	.000	-1.365	.006	-2.201	.000	-1.562	.001	-.893	.109
Pre 2	-1.532	.001	-1.573	.001	-3.785	.000	-1.838	.000	-1.093	.057
Pre 3	-1.474	.001	-.911	.040	-1.803	.000	-1.197	.007	-.419	.482
Pre 4	-1.004	.025	-1.293	.001	-.255	.516	-.896	.032	-1.434	.004
Pre 5	-.347	.429	-1.023	.017	-.984	.010	-.708	.096	-1.110	.004
Pre 6	.249	.592	-.199	.662	-.256	.484	.250	.608	-.879	.020
Pre 7	0	.	0	.	0	.	0	.	0	.

Table 5 (cont.) **Parameter estimates for questions 1–15 in the complex model**

	Q11		Q12		Q13		Q14		Q15	
	Est.	p	Est.	p	Est.	p	Est.	p	Est.	p
Post 1	-	-	.279	.852	-3.064	.053	-20.327	.000	-4.011	.010
Post 2	-	-	.813	.587	-2.553	.106	-20.088	.000	-3.533	.023
Post 3	-	-	1.312	.381	-2.033	.197	-19.270	.000	-2.958	.056
Post 4	-	-	1.910	.204	-1.488	.344	-18.108	.000	-2.449	.113
Post 5	-	-	2.574	.088	-1.029	.512	-16.984	.000	-1.870	.225
Post 6	-	-	3.456	.023	-.351	.823	-15.713	.000	-.914	.552
Post 7	-	-	.	.	.	.	.	.	.	.
Participant	-	-	1.673	.000	1.623	.000	.433	.073	.809	.001
Control	-	-	0	.	0	.	0	.	0	.
Romania	-	-	1.478	.074	.297	.724	.803	.370	.399	.606
Italy	-	-	.757	.338	-.817	.314	.291	.734	.535	.475
Sweden	-	-	0	.	0	.	0	.	0	.
Gender N/R	-	-	-19.929	.	-3.736	.067	-17.654	.000	-.996	.614
Male	-	-	-.229	.847	-2.630	.035	-16.950	.000	-1.939	.164
Female	-	-	.571	.634	-2.051	.101	-17.108	.	-1.282	.361
Other	-	-	0	.	0	.	0	.	0	.
Born in country	-	-	.445	.400	.628	.281	-.924	.067	-.909	.081
Born abroad	-	-	0	.	0	.	0	.	0	.
Majority	-	-	-.501	.292	-.589	.236	1.302	.006	.257	.584
Minority	-	-	0	.	0	.	0	.	0	.
Parent born in country	-	-	.210	.636	.032	.944	-.181	.677	.413	.339
Parent born abroad	-	-	0	.	0	.	0	.	0	.
Pre 1	-	-	-1.089	.103	-.762	.301	-.522	.382	-2.179	.000
Pre 2	-	-	-1.017	.144	-.651	.405	-1.452	.006	-1.235	.004
Pre 3	-	-	-.313	.663	-.257	.742	-1.346	.003	-1.642	.001
Pre 4	-	-	-.494	.530	-.290	.725	-.753	.053	-.647	.150
Pre 5	-	-	-.631	.424	.605	.488	-.681	.076	-1.272	.005
Pre 6	-	-	-.739	.417	-.470	.617	-.027	.940	-.409	.368
Pre 7	-	-	0	.	0	.	0	.	0	.

Parent Data

Surveys distributed to the parents of participating students gathered demographic data and responses to 16 Likert-scale confidence questions about the main concepts of the project. Data were coded and cleaned in a similar fashion to the student data. Table 6 shows a summary of the responses by parents to 15 questions.

Table 6 Summary statistics of responses to 15 questions by parents

	Mean			Median	
	Pre survey	Post survey	Change	Pre survey	Post survey
Q1	5.44	5.34	-1.70%	6	6
Q2	5.21	5.31	2.06%	5	5
Q3	4.15	5.09	22.63%	4	5
Q4	5.18	5.41	4.38%	6	6
Q5	4.33	4.84	11.78%	5	5
Q6	4.05	4.59	13.39%	4	5
Q7	5.00	5.47	9.38%	5	6
Q8	3.51	4.39	24.89%	3	4
Q9	3.64	4.28	17.58%	4	4.5
Q10	5.56	6.16	10.64%	7	7
Q11	4.77	5.25	10.08%	5	6
Q12	4.36	5.50	26.18%	5	6
Q13	3.74	5.06	35.23%	4	5
Q14	3.33	5.19	55.63%	3	6
Q15	5.50	6.00	9.09%	6	6
Q16	4.32	5.33	23.36%	4	6

Analysis

As this is a repeated measure of non-parametric data, a Wilcoxon signed rank test was performed to determine statistically significant differences between responses to the pre and post surveys. Full results of this analysis are presented in Table 7.

Table 7 Results of Wilcoxon signed rank test on responses by parents

	N	Z	P	R^2
Q1	32	-0.912	0.362	-0.161220346
Q2	32	-0.776	0.438	-0.137178716
Q3	32	-3.151	0.002	-0.557023367
Q4	32	-0.863	0.388	-0.152558288
Q5	32	-1.748	0.08	-0.309005663
Q6	32	-2.101	0.036	-0.371407837
Q7	32	-1.013	0.311	-0.179074792
Q8	31	-2.311	0.021	-0.415067853
Q9	32	-2.37	0.018	-0.418960768
Q10	32	-0.763	0.445	-0.134880619
Q11	32	-1.53	0.126	-0.270468344
Q12	32	-2.109	0.035	-0.37282205
Q13	32	-2.831	0.005	-0.500454824
Q14	32	-3.761	0	-0.664857151
Q15	31	-1.229	0.219	-0.220734916
Q16	26	-2.032	0.042	-0.398507987

Endnotes

1. *From here on, all references to the percentage of participants who were 'confident' on any given measure refers to the percentage of respondents who answered 5 or above to Likert-scale questions. Any references to percentage changes refer to the changes in means between pre and post surveys.*

References

i Ibid., p. 81.
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