2019

Cyber Safe Generation: Digital education by design

Evaluation Report

A RESOURCE FOR YOUNG PEOPLE, TEACHERS AND PARENTS

Co-funded by the
Erasmus+ Programme
of the European Union

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Project Overview

CyGen is a co-funded Erasmus+ Key Action 2 strategic Partnership. The project engaged directly with children (aged 8-13), teachers and parents in four European countries (United Kingdom, Belgium, Denmark and Greece) to:

1. Explore the digital opportunities and challenges as these are experienced by these groups;
2. Develop a novel participatory design methodology and methods in order to work collaboratively with children and young people;
3. Co-design a culturally, linguistically and age appropriate open-access multimedia education programme, a 'web app' with children in the four member states. Designed by children, for children, the web app recognises and builds on children and young people's knowledge and experience to support their safe, informed use of the Internet;
4. Produce online open-access guidance encompassing lesson plans and pedagogical resources to support teachers and educators in primary and secondary schools in diverse European education settings to support children's online safety

The CyGen project was created to understand the opportunities and challenges faced by children when they go online. The project worked with children, young people, teachers, parents and academics to map these opportunities and challenges and, with children, to design educational resources to support children's safety online. The project was unique in that children helped the project team to develop and evaluate an evidence-based digital educational programme to promote young peoples' online citizenship and safety across the four participating European countries (UK, Denmark, Belgium and Greece).

The outputs created for this project are:

- IO1: Scoping and needs analysis
- IO2: Participatory Design Model
- IO3: Design workshops
- IO4: Co-designed digital education programme
- IO5: Evaluation

Further information regarding the evidence-based digital educational programme can be viewed via our website http://cygen.eu/resources/

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Executive summary

CyGen was completed around a series of Design Cycles: a sequence of development activities completed by children in each partner country which informed the design of the Webapp. Evaluation was integral to this process and drew on appreciative inquiry methods in order to provide continuous feed back into the design of the programme from all stakeholders (children, teachers and parents) in each country in order to assess the overall quality and impact of the project (Beebeejaun et. al. 2014).

Methods and sample

Methods included:

I. Child-oriented interviews and focus groups
II. Interviews with teachers
III. Focus groups and interviews with parents
IV. Participant observation of children's engagement with the design cycle activities

Where appropriate, these methods made use of creative and arts-based methods in order to capture the ways that children express their ideas and to support their inclusion (Clark and Moss, 2011). Data was collected at three points during each design cycle:

- Data workshop phase - providing baseline 'pre-intervention' data;
- Design workshop phase - providing 'mid-point' data;
- Development and testing phase – providing 'end-point' data.

The sample included children (aged 8-13); teachers (including teaching assistants) and parents across each of the four partner countries as follows:

Sample	**UK**	**Denmark**	**Belgium**	**Greece**
Children (YPP: Young people's panel)	26*	15	10	5
Parents	20	3	15	8
Teachers**	20	5	15	14
Broken down by Design Cycle				
Data workshop				
Children	26	28	50	21
Parents	5	3	15	8
Teachers	10	5	2	9
Design workshop				

Children	26	28	50	21
Parents	5	3	15	8
Teachers	10	5	2	9
Testing phase				
Children	26	28	50	21
Parents	5	3	15	8
Teachers	10	5	2	9

*26 in all (design team, n = 8; quality team = n-10; ypp, n = 8)

** includes all the teachers and TAs and head from years 4-6 that were involved inc. in recruitment

Key findings

- Children in all four countries have lots of ideas about the ways in which the online environment can support their connection with others, learning and play, knowledge which is derived from their lived digital engagements including with family and friends.
- Children were sensitive to cultural and other differences, articulating high levels of tolerance in their online communication and are able to develop strategies to help them to navigate and communicate online.
- At the same time children across each partner country expressed the need for more information and support from trusted adults particularly when dealing with complex here-and-now situations.
- Children particularly value a safe non-judgemental environment – in school or at home - in which to explore their online experiences. This includes the input of trusted adults who are sensitive, honest, open and helpful when needed, for example in dealing with messages from strangers, managing personal data, phishing and viruses.

Parents and teachers articulated the ways in which they sought to support children to engage safely and confidently with the online environment including:

- Creating an open, approachable classroom environment where children feel able to talk about their experiences including the challenges;
- Teachers and parents were keen to develop new ways for home and school to cooperate to help children and young people develop their digital confidence;
- Teachers and parents found handling online safety issues for children very complex, requiring an ongoing process of setting up rules, supporting children and creating a space to engage in dialogue about situations as they emerge for children;
- Both parents and teachers said they wanted more information and support to keep up with developments.

Children, teachers and parents across the four partner countries responded positively to the design cycle activities and the co-designed educational resources, in particular:

- The ways in which the inclusive participatory design provided opportunities for open fruitful conversations about online opportunities and digital safety;
- Opportunities for dialogue, which were designed in to the Webapp were reflected upon positively by children, teachers and parents who commented how it supported children to develop their knowledge and skills, providing a safe space to do this in dialogue with other children, teachers and parents.
- The playful participatory design in which children's views and experiences were encouraged and respected as digital experts in their own right, including by wider audiences (journalists, policy makers and leaders in digital safety);
- Opportunities to create content, learn new skills through engagement with the project (film-making, public speaking) and scaffolded by the Webapp and wraparound educational resources (creating digital content, animations, documents and webpages) supported children to develop digital literacy.

Introduction

This report details the impact of the project and the co-designed educational programme (IO4), drawing from feedback obtained during the project as part of the design and evaluation process with children, teachers and parents in each of the four CyGen partner countries. These are: University of Northampton and University of Huddersfield in the United Kingdom (UK), VIA University College in Denmark (DK), UC Limburg in Belgium (BE) and the 2nd Elementary School of Kalamata, Greece (GK). A dedicated evaluation plan was developed at the outset of the project and implemented in parallel with the project's development cycle. It was formative, drawing on creative and arts-based (Clark and Moss, 2011; Mannay, 2015) and appreciative enquiry methods to capture:

- the ways in which children, parents and teachers experienced the project;
- the impact of the project and the educational programme.

The evaluation provided continuous feedback into the design of the programme as well as assessing its overall quality and impact (Beebeejaun et. al. 2014). The focus of the evaluation of CyGen aligns with four aspects that were identified in the initial project application:

- A/ Children's digital literacy, emotional intelligence and decision-making within cyberspace;
- B/ Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others;
- C/ Teachers' participation and co-learning about the ways they can best support children's healthy online participation;
- D/ Parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this.

Methods of data collection

Information about the CyGen Design Cycle, to which this evaluation is aligned, is captured within the project's reporting for IO2 on the CyGen webpage (http://cygen.eu/resources/participatory-design-model/). In summary, a three-phase Design Cycle was conducted in the four partner countries. The three phases of the Design Cycle were:

Within this the evaluation methods comprised:

i. Child-oriented interviews and focus groups;
ii. Focus groups and interviews with teachers;
iii. Focus groups and interviews with parents;
iv. Participant observation.

Sample	UK	Denmark	Belgium	Greece
Children (YPP: Young people's panel)	26*	15	10	5
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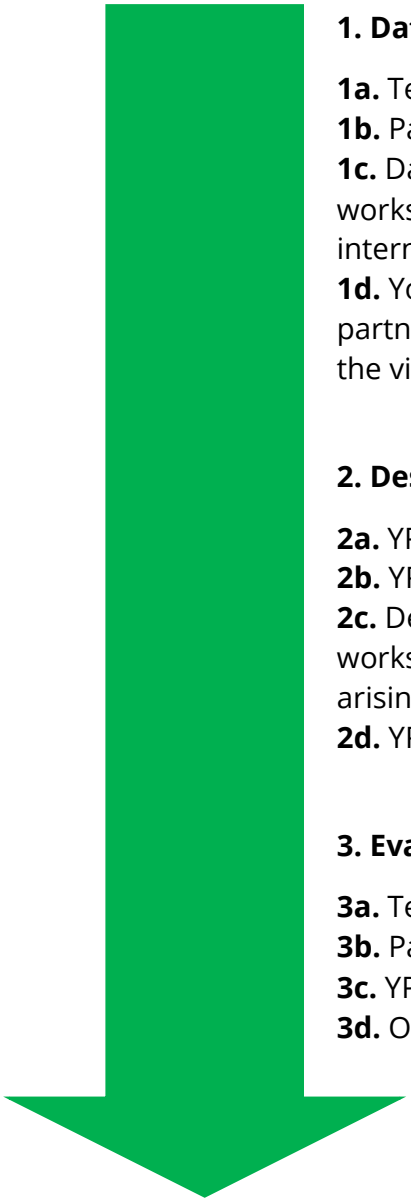
Teachers**	20	5	15	14

Data were captured from these activities to form: baseline, mid and end-point review of the project. It should be noted that, as planned, as the CyGen cycle unfolded in the four partner countries in turn, each country research team made important adaptations that were appropriate for each country's cultural context. The values underpinning the project were preserved throughout. This balance was an important and valuable feature of the CyGen project. The qualitative nature of much of the data presented for the evaluation has enabled us to make some useful comparisons which capture these differences as they are presented. Throughout the Design Cycle we attended carefully to what children, teachers and parents told us and used this information to inform our approach.

As we have noted in our introduction to this report, each Design Cycle was completed in the language of the relevant partner country. To ensure that the lead and supporting partner for the evaluation (DK team and UK team respectively), were able to adequately capture and present information for the evaluation, templates were completed by each partner country, designed to enable the detailed sharing of data across partners. This report presents a compilation of this information, collated by our DK team with the support of all partners. The following section provides an overview of the methods used to collect data at each stage of the design cycle which feed into this evaluation report:



1. Data workshop phase (baseline 'pre-intervention' data):

1a. Teacher focus groups and interviews;
1b. Parent focus groups and interviews;
1c. Data workshop (creative methods applied with children in a workshop context to capture the ways that they engage with the internet, and the challenges associated with this);
1d. Young People's Panel [YPP] (a small group of children in each partner country who supported the capture of key themes from the views of their peers).

2. Design workshop phase (mid-point data):

2a. YPP/ child-led teacher focus groups and interviews;
2b. YPP/ child-led parent focus groups and interviews;
2c. Design workshop (creative methods applied with children in a workshop context to capture the key challenges and opportunities arising from their use of the internet);
2d. YPP focus groups.

3. Evaluation and testing phase (end-point data):

3a. Teacher focus groups and interviews;
3b. Parent focus groups and interviews;
3c. YPP focus groups;
3d. Observations of

- example lesson utilising CyGen Wrap Around Text;
- engagement by children with the Webapp.

Reflections on child-led methods

All four CyGen countries' research teams noted that the data collection methods which involved children as peer researchers offered challenges and benefits, particularly in relation to data collection with teachers. At times, researchers felt that teachers did not feel comfortable offering in-depth examples which might enable the children interviewing them to identify others. The research teams thought that on occasion the

teachers may have restricted their responses to particular questions in order to avoid discussing topics that they deemed inappropriate for the children to hear.

Conversely, the research teams identified some real benefits to undertaking data collection in this way; children were able to prompt teachers for answers in ways that adult researchers may not have been able to do, leading to some interesting interactions between children and teachers. This was evident in several partner countries. In future participatory studies, researchers may consider undertaking data collection with child interviewers, with a short follow up by adult researchers to ensure that anything that teachers wanted to add could be captured.

Ethical issues

The project design was guided by the University of Northampton Ethics Code and Procedures and the British Educational Research Association (BERA) *Revised Guidelines for Educational Research* (2011; 2018). An ethical protocol was developed by the UK partner in liaison with other country partners and ethical approval was obtained through the University of Northampton Research Ethics Committee. The remaining partners were briefed on the project's ethical protocol during the project's third Transnational Partner meeting (Northampton, UK: February 2018).

The following ethical values underpinned our approach and engagement with CyGen organisational and individual stakeholders:

- The best interests of participants (including children) were the primary consideration throughout the project;
- Potential participants received full information about the project prior to consent being obtained (informed consent for children's participation was also obtained from primary caregivers), in language and design which met their needs;
- Consent was revisited periodically throughout the project, ensuring that it was ongoing in nature;
- Participants were able to withdraw at any point during the project and were informed of their rights in relation to this;
- School settings hosting the project were made aware of the ethical parameters of the project to ensure consistent messages were given to children, parents and teachers;
- Participants' data was treated confidentially and anonymously. The potential for identification in images used in association with the project was fully disclosed and the wishes of children, parents and host organisations in relation to this were fully respected. In accordance with the study schools' own policies,

photographs and video footage have been used in reporting and dissemination activities;

- Data collected as part of the project has – and is – stored according to University of Northampton required protocols, using secure servers. Initial information provided to primary carers and children and young people included a section concerning privacy that addressed this.
- Information about the outcomes of the project is openly accessible via the project website and participants were fully informed of this;
- Initial information provided to all participants (and the parents/ carers of child participants) included a section concerning disclosure.

Data Workshop phase

The Data Workshop phase of the Design Cycle marked the first period of formal data collection in each partner country with children, parents and teachers. The workshops themselves took place within the school setting. All partners based their approach on the core Data Workshop Guide developed and tested by the DK CyGen team. This is embedded in our Design Kit (http://cygen.eu/resources/participatory-design-model/). Cultural and age-appropriate adaptations were made.

Data workshop design

During the Data Workshop, children worked in groups to complete a range of activities including model making (using Lego and Play-Doh), drawing and making posters. The activities captured a range of different themes about their online experiences. These included creations which:

- Shared their recent experiences of going online;
- Shared examples of what they use the internet for;
- Shared examples of situations they find fun or challenging;
- Shared examples of 'safe' internet behaviour.

These activities were interspersed with group discussion and feedback. Members of the UK CyGen team observed and supported, rather than facilitating, their discussion. The researchers also noted key points of discussion, enabling future interpretation and analysis of the images and models that were created. In some countries, these discussions were recorded by the children who took responsibility for passing this around to capture key points of importance.

Young People's Panel focus groups

In each country, the Data Workshop was followed by a focus group with a small group of children called the Young People's Panel (YPP). The YPP members remained part of this group for the entire Design Cycle. Focus groups lasted up to an hour in duration and were conducted as close to the Data Workshop as possible, ensuring that discussions were fresh in the children's minds. The aim of the focus groups were to:

- Ensure that children's voices were at the heart of our research;
- Capture data to inform CyGen scoping (IO1) and evaluation (IO5);

- Generate themes from pupils' discussions and activities. These themes were used to underpin the Design Workshop.

Children were asked to feedback key discussions arising from the data workshop, and in this way to represent the views of their peers. Broad themes were used to underpin the discussion. The groups were audio recorded and fully transcribed for analysis.

Focus groups and interviews with parents and teachers

After each Data Workshop, focus groups were completed with schoolteachers and parents respectively. The core CyGen Design Kit offered a starting point for the development of discussion themes in each country, and these were developed using the initial analysis of themes arising from the children's Data Workshop, ensuring that we captured data that was relevant for each context. The discussions were recorded and transcribed verbatim.

Analysis of data arising from the workshop phase of CyGen is presented in the sections which follow.

The views of teachers

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Four themes emerged from the teachers' focus group interviews in relation to children's digital literacy, emotional intelligence and decision-making within cyberspace. These were: (i) Core and soft skills development; (ii) Digital literacy is not only developed by using technology and digital media, (iii) Shift in roles and decision making in social behaviour, and (iv) Age limits and issues – emotional intelligence and decision making.

Teachers in all four partner countries generally focused on children's development of core skills related to their school systems, for example searching for and obtaining relevant information. Teachers across all partner countries reported favourably on the soft skills that the children they work with have for finding and searching for information online. Teachers in some countries commented on how the internet could support children's motivation to learn, enabling them to develop interests and social connectivity.

In general, teachers felt that children could sometimes lack understanding of abstract concepts; information needs to be relevant and readily applicable to their lives in order to support their learning. The challenges associated with teaching children how to be critical in relation to information found online was a common theme across all partner countries; teachers were concerned about children's access (and at times uncritical use of) 'fake news', and it was not uncommon for children to directly copy sources found online in completing school work. Here, a difference was highlighted between children's ability to find information, and the extent to which they could appraise and apply it. Teacher in our Danish school referred to this as 'junk work'. As we have noted elsewhere, our Danish school was a designated iPad school. This meant that they had access to digital technologies at home and school from a very young age. Our Danish CyGen children used social media on a large scale. Teachers (and parents) across all partner countries agreed that digital literacy is not developed by solely using technology and digital media, but that it also requires support and assistance in formal educational contexts. The spoke of children's wide-ranging use of the internet for entertainment, creativity and social connection, reflecting that their general ICT skills (programming and word processing for example), were often less developed.

Teachers in all four partner countries highlighted that children can navigate basically and use digital tools better than adults – the children are quicker and use skills like skimming, scanning and interacting immediately with digital tools, perhaps because they are 'digital natives' (Livingstone, 2014). This could at times also represent a shift in roles with teachers being taught by children. In UK the teachers generally spoke more positively than teachers in our other partner countries about the range of knowledge that children had about online spaces, and the ways in which they could keep themselves safe online. "*They all know a lot and they really impressed us with kind of their awareness of how to be safe if those things happen – like with the games and even e-mails and things – they could kind of apply what they did know to the situations they might not have been in yet*" (Teacher in UK). UK and Belgian teachers mentioned the importance of peer support, learning and discussion, for example when a student has a YouTube channel and can show the class the functions.

In Denmark, the UK and Belgium, teachers discussed age limits associated with particular social media and gaming platforms, highlighting their knowledge of widespread use of these platforms by children who they felt were too young to engage with them safely. In line with this, teachers in Denmark mentioned that the children they worked with often considered themselves more competent than adults and younger children, resulting in an overestimation of their own competencies and

experiences of consequences that they could not foresee. This presented, for example, as difficulties in social contexts with friends, peer pressure, being able to end a situation (border issues) as well as other online situations and elements of risks to their safety.

In general, the teachers indicated that they found it necessary to support and guide children, and this was often delivered in group contexts within the classroom, enabling peer learning and shared support with consistent messages around safety. Danish teachers, for example, said that they advocated a "grandmother rule", which supports children not to do or say anything their grandmother would not do or say.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

Here, we report on two primary themes arising from our data collection with teachers at the outset of the project. These were: (i) Learning about different cultures, and (ii) Challenges in communication and co-operation with others.

Teachers generally focused on the positive opportunities that the internet offers children for learning about other cultures. They framed social media platforms as good communication tools that can affect the individual child's social contact with other children, sometimes through gaming:

> "*I think some of the children who might be alone in school are participating in social settings online. Those who may go home from school and not have someone to be with they meet others online … and have social contact with others*"
>
> (Teacher in Denmark).

The instantaneous opportunities for children to find information about countries across the world were seen as a particular benefit in terms of what the internet could offer, with one teacher in the UK stating:

> "*It just makes the world a smaller place doesn't it?*" (Teacher in UK)

Teachers expressed the view that learning about different cultures was embedded into teaching and learning in a range of ways, including searching for specific information using research and comprehension skills. In the UK, teachers told us that they encourage children to speak actively to other people from across the world, citing

school activities where children skyped with pupils from a partner school and with an international author.

In Denmark the teachers also identified some challenges in respect of, what they perceived as, the children's ability to collaborate because of the increasing individualization and a "me-fixation". They also referred to what they perceive as increasing challenges that children have in understanding facial expressions and therefore highlighted the importance of physical spaces for communication.

Teachers' participation and co-learning about the ways they can best support children's healthy online participation

Three challenges were identified from the teachers' focus group interviews in relation to teacher's participation and co-learning and the ways in which they can support children's healthy online participation. These were: (i) Digital materials and teacher training, (ii) Teachers' competencies, and (iii) An open approach – support and dialogue.

The teachers in all four partner countries said they generally use a range of technology and internet in school, for example tablets, PCs, laptops and sometimes robots. A range of applications were also used including iMovie, Google, YouTube, Skype and Twitter. However, the teachers in the four partner countries reported wide diversity in access to technology for teaching purposes. In the UK and Denmark, teachers could access a range of technology. In Greece, teachers reported that access to technology was limited and often not up to date. Teachers in all countries reported a need for increased training and resources to enable them support children's learning in relation to healthy online participation.

In general, the teachers in all countries felt that they played an active role in supporting children to learn about the challenges and opportunities arising from online participation. In Greece, teachers reported that they use both constructivist and constructionist approaches to educate their children in 21st century skills, for example by enabling them to build knowledge through experience, to be aware of their learning and in using classroom-based discussions to embed it. However, the teachers were not always comfortable with Internet safety and explaining it to students. In the UK teachers told us that they often pre-load information and examples they want to use because of concerns about popups and adverts during teaching. Teachers in Denmark also mentioned the challenges of explaining online risks – both because of their own lack of digital competencies and education in the field, and their views about their own role of

being responsible for educating children about social media the children use in their leisure time because this might present a disjuncture in their relationships with parents.

Teachers said they tried in general to use trusted websites to educate the children in the uses of digital media in the classroom. They explained the importance of presenting an open approach to any challenges that children disclosed to them.

Because of the wide use of digital devices among the Danish children, the teachers in Denmark said they educate the children in some informal situations, or 'here and now' situations, for example, challenges with friendships in the class on Snapchat. The teachers, especially in Denmark and the UK talked about ways to ensure that the children were safe online, and how they tried to establish an environment in the classroom where children could share experiences and ask for advice:

> *"... (children) need the courage to say," I've got this message, what should we do about it?"* (Teacher in Denmark).

> "*They saw me (teacher) as someone safe they could talk to and that's why I found out about it. I think if I'd jumped down their throat in the first week – about this, about that they'd probably think 'Oh I can't tell Miss because she'll just tell us off', whereas they kind of were like 'Oh this has happened - this was a bit strange' and that's how we found out about it. And they hadn't told their parents, so it was obviously they'd seen it as a safe place to go to which is a good thing."*
>
> (Teacher in UK).

Dialogue was generally the most important approach for supporting children's development of digital literacy, decision-making process and healthy online participation, although this was not without its challenges. Some teachers felt that they needed additional training in how to broach sensitive topics with children, and parents. Teachers in the UK and Denmark talked about the possibilities of intervening early in children's digital lives to enable the creation of open and trusting relationships with children and parents alike.

Teachers' perceptions of parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this

Teachers highlighted four themes concerning this aspect in their focus group interviews with CyGen researchers: (i) The importance of parental involvement, (ii) Parents' training and awareness, (iii) Parents face increasing challenges, and (iv) Teachers' awareness of how parents respond to challenges.

Teachers, especially in the UK, noted increased challenges that parents face in supporting their children to spend time online. This seemed to be linked to the variety of methods that were open to children for going online, and the focus of technology in many children's leisure time. All teachers in the CyGen partner countries said they found the involvement of parents essential for building children's healthy online participation. Our Greek teachers told us that children are quick to follow the behaviours of their parents in relation to technology.

There were some differences in how teachers articulated the distinctions between the roles of parents, and the roles of teachers. UK teachers said they generally found relationships between teachers and parents open, but in Denmark the teachers found them more problematic. Danish and Belgian teachers returned repeatedly to the parents' responsibilities in relation to the children's digital behaviour and experiences. They said that at school, they sometimes experienced the parents pushing large parts of the work with digital education and digital literacies to teachers but that this should be a shared responsibility.

Most teachers that we spoke to told us that whilst partnership working was important, distinctions should be made between school time and leisure time, and that this should help to determine who is responsible for the children's digital education, literacies and behaviour at any given time. Our Danish teachers explained that due to children being given an IPad via the local educational authority, some of these challenges were heightened, and the boundaries of responsibility between home and school were often blurred. Teachers in our school in Belgium told us that parents have previously delivered training to teachers and students about safe Internet use. Teachers in the UK also mentioned their relationships with different types of parents – some more actively involved and others more passive. Teachers in the UK also noted that sometimes they were unsure if the key messages and behaviours that they tried to instil at school were observed in the home environment; parental awareness was deemed a key part of this.

In Denmark, the teachers also seemed to be very unsure about parents' involvement in relation to their children's school.

The views of parents

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Analysis of data arising from interviews and focus groups with parents at this stage of the project elicited three core themes. These included: i)Digital and literacy skills related to information, entertainment and communication; ii) Potential risks: Naivety, lack of "filters" and making the "right" decision; and iii) The paradox of rules and independence

Parents in the four partner countries expressed the view that their children had built digital and literacy skills in their usage of phones and tablets, especially skills related to three primary areas - source information, entertainment and in communication contexts with friends - and the devices could be either their own or their siblings' or parents' devices. They identified a range of skills that they felt their children developed through their usage of the internet over time. Some of these related to particular children and their interests (e.g. editing videos), while others were considered skills which children would develop through time spent online in general.

- ICT skills;
- Creativity;
- Responsibility and safety;
- Research, for example potential careers and information about the world.

Parents in general perceived their children as producers and not only consumers, for example by making creative productions such as films, skills in communicating in online games or seeking knowledge online and skills in using the systems provided by the school. In the UK and Denmark, parents noted just how integral technology is to children's lives:

> *"…because they've been bought up with so much technology, they just cannot fathom life without it"* (UK parent).

Medialisation of childhood is therefore an important perspective related to development of the children's digital uses and literacies. Parents told us that children do not often have homework that requires them to spend time online at home. Rather, they

indicated that the internet was used in preference to books for ease of access to information, the development of interests and hobbies over time, gaming and watching television or vloggers – for example social media and apps such as Instagram, Snapchat, YouTube, Viber, Fortnite etc.

Parents also saw different digital skills develop over time according to the children's interests. Danish parents noted an age-related development meaning their social behaviour, not only concrete IT skills, change and are developed over time. For example, issues related to language use, establishment of friendships, awareness of behaviour and changes in behaviour:

> "*But lately, I have noticed that there might be somethings that passes me by. That she might be the one who suddenly bullies or behave badly against others on the Web without my knowledge."* (Danish parent).

Parents also discussed potential risks related to their children's online lives. Danish parents were concerned about the naivety in their children's online participation. Like our CyGen teachers, these parents felt that their children needed to develop skills to "filter" through information, but that to do this, they first needed to develop their emotional intelligence and decision making:

> "*There is their naivety ... mom I just talked to someone named Nanna. Yes, you don't know if Nanna has a beard. They are also a little bit... what is it called... a little naive.*"
> (Danish parent).

Parents in UK told us that events in relation online safety had been held at their child's school. One of the take home messages that they received was in relation to listening to your body/ feelings when judging whether you are making the right decision online. They explained the concept of having "butterfly feelings" in relation to make the "right" decisions online:

> "*You get that feeling in your tummy when you know something's not right*"
> (UK parent).

In all countries a paradox was evident between parents and their children's online participation which can be interpreted as the parents' concern for the negative influence of others on their children's identity and development. All parents talked about the importance of setting rules and boundaries in relation to their children's

digital participation, thereby reducing both the level of decision-making that their children had, and concurrently the risks posed by strangers online. In addition they mentioned the importance of reducing the risk of game addiction and avoiding self-staging or bad influences by the negative mirroring of others bad behaviour online.

There is a paradox among parents about rules and limits in their children's digital participation and development of digital literacy. On the one hand, parents indicated that they feel a responsibility to set boundaries through rules, and on the other hand they want to show confidence in their children, and to develop their decision-making skills. They want to allow their children to have their own experiences by finding out things for themselves in an independent use of the internet.

Greek parents handled this a little differently by applying a high level of monitoring when their children spend time online. They told us that their children are only usually able to access the internet in their own right when a parent is nearby.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

At this point in the CyGen cycle, this was not a focus area for many parents in the four partner countries. However, they did identify two themes during their focus group interviews: (i) Access to the world, and (ii) The social code is important.

Parents in all partner countries commented on the opportunity that the internet offers children to learn about the world. In general, parents felt that it enables their children to develop understandings of the world and other cultures and traditions. This is also referred to by parents as opportunities to experience something before actually trying it, for example our parents in Belgium explained that where they were due to visit somewhere new, children would often go online first to use popular map-based sites and explore beforehand.

Parents talked about their children's abilities to navigate in the online social spaces with which they interact, and in showing awareness of social and cultural difference, tolerance and respect for others. In Denmark particularly, parents mentioned that their children have a good understanding of how to engage socially based on current online norms – the social code - for example in a game forum where the language can have special codes for interaction. In practice some parents were concerned that virtual interactions online could detract from their child learning to interact in a face to face

context. This point also indicates that parents try to show understanding and desire to recognise the children's own digital culture online. Some parents find it challenging to find time to fully engage with their child's interests online in addition to busy daily lives. This could sometimes lead to guilt that they were not overseeing their child's online participation as often as they felt they should.

Parents' perception & co-learning about the ways in which teachers support children's healthy online participation

Parents reflected in detail (in all four partner countries) on home-school collaborations. The parents that we spoke to showed a keen interest in how school could support themselves and their children in learning about the digital world. In UK the school has run sessions led by outside facilitators for supporting children to keep safe and the children were being educated in recognising when they are not safe. At the same time, our UK parents reflected that those attending the focus groups were also usually those who attended information events about online safety at school; not all parents were perceived to have the same level of interest. Parents in Greece pointed out that the school has a responsibly for training and informing parents. The parents are not really aware of their children's training in the use of new technologies in their school and/or in their personal lives and that they need as parents to be more educated on this issue.

In Denmark the conditions seemed to be more conflicted because the Danish school that participated in CyGen was an iPad school which provides its children with digital devices. The parents in Denmark seemed to be more critical of the school. They considered it an issue of trust that the school should find better ways of setting up limits and rules for digital participation, particularly when offering this type of technology which could be brought into the home environment from school itself.

Parents' understanding of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this

Three themes relating to this topic arose from our focus groups with parents. These include: (i) Challenges, risks and online security, (ii) Parental support, and (iii) The parental role.

Parents shared their knowledge of a range of challenges that faced their children online and explained a range of strategies employed to support their children with these. These challenges included:

- Peer pressure to participate, for example social media;
- Sharing of personal information and digital footprints;
- Accessing inappropriate content (and having inappropriate content shared by friends which was unrelated to their child's own decision-making);
- Bullying;
- Game addiction;
- Negative mirroring in others/self-staging.

They also defined online security based on different things such as:

- Setting up a parental filter to shield children;
- Avoiding viruses;
- Phishing;
- Children's general shopping online, as they say yes to things that they should not;
- Unknown relationships and connections;
- Grooming;
- Sexual violations;
- Exposure to pornography.

It is noted that many of the terms - for example 'phishing' - were not used by the parents in their discussions and have been applied during analysis.

In general, parents participating in the focus groups overwhelmingly thought that parents had a role to play in supporting their children's time online, giving them the resources to develop their own decision-making. Participating parents shared examples of ways in which they supported their children's uses of the internet, ranging from restricting access, to boundary setting (boundaries for children to apply to their use of the internet), developing and maintaining open communication and sharing experiences online. These themes are set out in the following table:

Theme (parental support in use of the online environment)	**Sub-theme**
Restricting access and oversight	Restricted usage times
	Using technology to restrict access (e.g. filters)
	Oversight and review
	Communicate only with people known to you in real life
	Communicate only through particular apps
	Devices should be used in certain rooms within the home
Open communication	Sharing information
	Trust and communication
Shared experiences and learning	Shared learning
	Learning from your child

In all four partner countries, parents mentioned that they try to build trustful relationships with their children to guide and support them in their online participation, particularly through open communication and dialogue and being available to their children when needed. However, in attempting to be both open and restrictive, parents are presented with a paradox.

Parents in Denmark pointed out that they sometimes feel guilty about their involvement in their children's digital lives. They said it is difficult for them to determine the level of involvement and at the same time know their own 'blind' spots, abilities and interests in the online world. The Belgian parents added that it is difficult to support their children online because of their own lack of knowledge and the speed of technological development - a reference to the level of their own digital skills. In the UK, parents mentioned that they also have to accept that their children might not make the choices that they want them to make and that their naivety may sometimes be the reason.

Overall, however, the across all four countries parents said they support - or want to support - their children's uses of the Internet in ways that include restricting access, boundary setting for children in their uses of the internet, developing and maintaining open communication and sharing experiences online.

The views of children

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Children who took part in the data workshops told us that they had a range of experiences in the online world. They generated words about going online and used creative methods to illustrate their ideas about how to stay safe online. Mediums included Lego, Playdoh, pictures, text, cartoons, characters stories and colourful slogans. Examples of words the children generated about going online included:

> *Fun – Intense – Stressful – Amazing – Funny – Enjoyable – Entertaining - Mesmerising - Interesting – Funny – Useful* (Facilitator notes from UK).

The activities also indicated a high level of knowledge and confidence regarding the children's own use of the internet, its opportunities and its challenges such as:

- Talking to trusted adults about concerns;
- Using privacy settings;
- Not talking to strangers;
- Dangers from viruses - usage of virus scanning;
- Using age appropriate apps, games and websites;
- Always asking an adult they trust when feeling unsure;
- Not to be hacked;
- Phishing (in Denmark this was a word learned in the workshop and articulated during the activities);
- Bullying;
- Inappropriate messages;
- Personal settings.

Children were also able to articulate safety advice for other children in the plenary sessions during the workshops facilitated by teachers and researchers.

What children think about the role of parents in supporting them to manage the benefits, challenges and risks of the digital world for children

Children told us that parents play a key role in supporting them online. For example, in Greece the children said that they always expected their parents and teachers to protect them when something goes wrong. In all four countries the children thought that parents should be aware of what their children are accessing online, for example

being aware of new sites or if a game was accessed. Some children expected parents to play a role in decision-making about their online access.

Some children associated parental involvement with physical proximity, suggesting that they were used to their parents being close enough to observe their online interactions and to support if needed. A number of children saw parents as protectors, able to support and respond them in challenging situations which they may need help to navigate, including challenges arising from the actions of other people online. At this stage of the project across all partner countries the children did not elaborate on the reasons or justifications behind their parents' rules. The contributions of the children during the data workshops suggest that at this stage of the project they focussed on the ways in which their parents support with the *challenges* of being online, rather than the *benefits***.** Children's contributions of parental support in the online digital arena tended to focus on protection from online challenges, rather than potential benefits of Internet engagement.

The data workshops suggested a significant need to protect children by initiating discussion on safe internet use and guiding them into realising their own internet actions and practices and reflecting on them. These themes were reflected upon and elaborated in the group discussion with the young people's panel in each country, discussed as follows.

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Four themes arose in the YPP focus group interviews which align to this topic. These were: (i) Good things online; (ii) Navigation online – challenges and strategies; (iii) Decision-making supported by feelings; and (iv) Parental involvement.

In the focus group interviews, most of the children told us they have access to a range of different devices which are used for a wide range of activities online. The online activities they said they enjoyed included - but were not limited to - gaming, connecting to friends, making videos to post online, watching vloggers and searching for information. These children said they spend time online when they can and found the platforms easy to navigate. However, they said they encounter difficulties going online when software is outdated, or unavailable, or systems crash during attempts to access particular sites.

Some good things the children identified during the focus group interviews about being online include:

- access to music, videos (also creation of videos);
- the search for information about school projects and in general;
- entertainment, search for videos showcasing constructions/inventions;
- gaming;
- access to online maps (directions);
- to reading books (kindle);
- to feel socially oriented;
- that you can share things that others can see;
- be able to reflect on others than their friends;
- be part of a community – avoid exclusion;
- find friendships with people they have not always met offline, e.g. gaming friends, Instagram friends.

The children seek or build strategies for *how* to act and navigate online, for example in relation to unpleasant things such as bullying, 'haters' or 'stupid' comments. The children were able to articulate knowledgeably how to deal with challenging situations that they had heard about, imagined or encountered in person.

During the focus group interviews, the YPP children identified a number of **challenges for online navigation and behaviour**. These included:

- Systemic considerations (e.g. hacking or viruses);
- Digital literacy issues (e.g. decoding);
- Identifying what is true or false online;
- Phishing;
- Illegal websites (pirate movies, programs, games, sales websites);
- Scams (safe net);
- Being cheated (generally or in games: "A boy tells that he had stolen his avatar in a game and all the things he had earned with his avatar in the game" (YPP in Denmark);
- Controlling private information and profiles;
- Exploitation by strangers of shared personal information and images;
- Compliance with age limits for games, YouTube, Instagram, Facebook, etc.;
- Anonymous people;
- Digital footprints – "…they might find you" (YPP UK);
- Changing ownership of information;
- Complicated systems to navigate and use (e.g. Facebook, Twitter);
- Messages from strangers and making decisions about ignoring them;
- Haters;
- Grooming;

- Risky and dangerous online games in which unknown individuals threaten children;
- Viruses and harmful images on game platforms (e.g. Blue whale);
- Finding help when needed.

The YPP children also identified several **strategies for online navigation and behaviour** during the focus group interviews:

- Do not bully;
- Treat others as you would like to be treated;
- Do not give information about yourself (e.g. where you live or your phone number);
- Never share pictures with someone you do not know;
- Only click on things you want to see and do not touch anything you do not know;
- Only talk to people you know;
- See who your "fictional" friends (online friends) are - is it something for your age?
- Do not look at stupid things;
- Use your common sense;
- Do not show things you do not want to see again;
- Comment on something you find wrong, e.g. hate messages to your friends;
- Do not cheat or deceive others on their private profiles;
- Understand the serious nature of social media - nothing is always good and fun.

In Denmark the "Grandmother Rule" was discussed: a rule for which you do not share, write or say something you do not want your grandmother to see or hear. However, in the focus group interview in Denmark YPP children suggested that while many children formulate rules and norms for good online behaviour, their actions do not always align with those rules and norms.

Examples of good advice and important key themes arose during the focus groups. Based on their discussions about challenges and strategies, the YPP children generated themes and perspectives for further research and the design cycle and workshop during a 'Post-it' process that followed the focus group interviews. In Denmark the children identified these themes for further work in the project and the design cycle:

>"Who are you online?" (Note: Formation / Own Identity - Behaviour / Norm):

- Yourself as a role model on social media
- When others see you, what do they see and what do they want to say about what they see?

>**"When the others are haters"** (Note: Social Understanding / Mobility / Role, Behaviour and Strategy)?

- What do you do when you witness others' bad behaviour (bullying, comments, haters, etc.)
- What could you do?
- Who can help you?

>**"Should We Be Friends?" -** (Note: Relationships and Friendship)?

- How can you be friends with someone you have never met offline?
- How do you become friends?
- What do you do as a good friend online?
- What do you do when you find that your online friend is 34 years old?

>**"The Grandmother Rule"** - (Note: sharing content: comments, pictures, movies, etc.)

- When does the grandmother rule and when does not it work?
- How do you use the grandmother rule online?
- (e.g. Grandmother does not like ugly language, but when you hear ugly language in the online game you love to play, how do you react? Grandmother does not think it is good to show your face on Instagram / snapchat / Musica.ly / Facebook, but you like to see pictures of your friends. Do you want to show pictures of yourself and your friends?)

>**"True or false?"** - (Note: Decoding and digital literacy)

- You get cheated online - what do you do?
- You need to download an application online - how to find out if it is a legal website?

>**"Heeelp"** - (Note: Resilience, Literacy, Support, Strategies)

- What do you do when you need help?
- Your parents have forbidden you to be on Instagram, but you are and now have got nude pictures from a boy of 17 - what do you do?
- Someone has taken screenshots of your Snapchat, which you do not want them to save - who can help you?
- How do you help others?
- You have written a comment for fun to a friend which was misunderstood, and you have now become unfriended – how can you make friends again?

In Greece the children created posters, for example with a True/False option for choosing how someone would act on the Internet. They used vivid colours and details showing problems and dangers with clear explanations and they discussed topics including viruses and internet dangers. Five groups of students made posters with the following messages:

- Group 1: "Don't give personal data or pay attention to false messages"
- Group 2: "Attention when you're in the Web"
- Group 3: "Viruses fight"
- Group 4: "A Computer downloading dangerous games"
- Group 5: "Avoid talking to strangers"

In the UK, children told us that decision-making online was supported by their feelings. Their ideas about noticing what 'feels right' was a recurring theme in the data workshop and during the design cycle in the UK. The children framed their reactions with emotional language which commonly focused on annoyance, frustration and stress. Some children noted that in these instances they would seek support from a trusted adult.

Children also identified that parental involvement has an impact on their decisions. For example they said that in some instances the extent to which they are able to make their own decisions may be restricted, for instance if a block is placed on a particular website. Equally, some children noted frustrations about being closely observed by their parents when they were spending time online, and they said they experienced restrictions due to their device or Wi-Fi settings within the home.

In Denmark the YPP children were in 6th Grade, and they indicated that they felt older and more mature than younger schoolchildren. The Danish YPP discussed the age issue and considered if they are old enough to be online as well as dilemmas that may arise when participating online. They identified, for example, that it may be difficult to involve their parents if something bad happens on an online platform that they are not allowed to use.

In Denmark and the UK, YPP children considered themselves fairly independent in their online decision-making and saw their parents and teachers on the side-line in relation to their online behaviour, only needing to become actively involved when necessary, for example if a bullying incident arises.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

Many of the children that we worked with during the project said that digital media and the Internet can help them find friendships with people they have not always met offline, for example gaming friends. However, discussions in relation to other people tended to focus on issues of safety. The children offered examples about hackers being present in the online environment, with some saying they had experienced this.

Danish children noted that mirroring others' behaviours including those of older people - can be a helpful part of learning and developing. They suggested that in a situation where they do not know how to behave or act when they are online, they can make a strategy. They said they had "a hope" that people would show respect for each other and that they needed to be able to rely on their friends to do so. These children's views indicates their desire to remove inappropriate content and highlights both their awareness and their digital citizenship:

> *" ... there was a boy who did something like that, take a picture of yourself, then we make a "smash or pass". Then I took a picture of myself. Then I wrote "OMG can you remove this picture again, because it is probably embarrassing". And fortunately he was nice to take it down."*
>
> (YPP in Denmark)

> *"I once sent a picture of my face where I had sunglasses in my hair, to someone I didn't know (...). Then he wrote back to me - "You should be more careful. Take care of yourself". And I just didn't know what to do."*
>
> (YPP in Denmark).

Children's perceptions of teachers' support and parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and the role of parents in supporting this

Children in Denmark and Belgium discussed their perceptions of teacher's role in supporting their healthy online participation in the (YPP) focus group. They told us that schools should play an active role in teaching children. The Danish YPP qualified this belief in terms of age: they thought younger students are not mature enough to be

online and that schools needed to ensure that their approach to supporting children reflected their age.

Children in all of our partner schools also discussed their understanding of parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage this, along with the role of parents in supporting this. Children's contributions during the focus groups centred on two key issues: (i) Trust is a key issue, and (ii) Involvement when needed.

In all countries the children noted that the parents should be there if needed, for example if someone bullies. The involvement of parents or a trusted adult was also a key theme in their decision making. The UK YPP highlighted that parents need to be hyper-vigilant about what their children are doing online and children's advice for parents was to check in occasionally on what they are doing: *"They (parents) should check on you regularly"* (YPP in the UK). One child talked about using a proxy *"...guardian such as a soft toy"* (YPP in the UK). However, in general the children valued their parents trust in them. They thought it very important that parents are able to build their trust in their children's online activities, or as the children in Greece mentioned, that parents need to be more sensitive.

YPP members said that young people expect their parents to be honest with them, talk to them about the real dangers and help them when needed. They said they want their parents to be discreet and not shout at them when they make mistakes or fall into traps but to protect them. In relation to this perspective, the Danish YPP said it is difficult to involve parents if something bad has happened on an online platform that they are using but that they are not allowed to use.

Generally, the children wanted to be open with their parents and for them to get involved when they needed them to do so. They thought that it should be possible to *"ask your parents if you are unsure"* (YPP in the UK). The YPP said that young people expect their parents to be honest with them, to talk with them about the real dangers and to help them when needed.

In the UK and Greece the children said they were comfortable about parental settings. The Greek YPP that they feel safer online when they know their parents use a computer password (parental control) and have a high protection antivirus control system to block junk mail and misleading advertisements and messages. These YPPs also reported the need to keep their personal data safe and not share them with anyone. They recognised

the need to ask an adult for issues they encounter online that create questions or dilemmas and they knew they should not trust unknown apps. These children thought their parents had a responsibility to protect their children from potential online dangers by discussing them with their children, controlling the computer system and by providing a positive parental model.

YPP children saw their parents as an extremely important part of children feeling safe online. They reported that parents:

- Use history on devices to see what has been looked at
- Can be connected to children's accounts so that they can see what is happening
- Use parental controls

Design workshop phase

The Design Workshop phase of the Design Cycle marked the second period of data collection with children, parents and teachers in each partner country. The Design Workshop stage of the design cycle was completed in a similar structure to the Data Workshop stage. All partners based their approach on the core Design Workshop Guide developed and tested by the DK CyGen team. This is embedded in our Design Kit (http://cygen.eu/resources/participatory-design-model/). Cultural and age-appropriate adaptations were made.

Design Workshop

The Design Workshop in each partner country again took place within the school setting. The first activity was a short (five minute) discussion as a whole group about the main themes arising from the Data Workshop. CyGen team members fed into these discussions using their initial analysis of data arising from the previous stage of data collection. Country teams felt that this exercise acted both as a 'warm up' for children, whilst also offering additional data to build on the findings of the data workshop.

The children were then offered activities through which they created 'dilemmas': in the form of opportunities or challenges associated with their use of the internet. Where the dilemmas included challenges, they also spent time considering possible solutions. Some children chose to present the dilemmas as stories with characters that they felt that other children could associate with. Other children wrote about problems and solutions in a second person narrative. Regular feedback and discussion fed through each Design Workshop to enable the researchers – sometimes supported by children – to capture the key ideas and discussion.

Young People's Panel focus group

The Design Workshop was again followed by focus groups with the Young People's Panel in each country, in order to capture key themes of importance. The discussions were verbally recorded and transcribed verbatim. In some countries, this was also aligned to direct (virtual) conversations with members of the BE team to enable them to

hear from the children first-hand as they began to develop the WebApp. In other countries, it was not practically possible to facilitate this and therefore the CyGen research team presented their findings.

Focus groups and interviews with parents and teachers

A second round of focus groups and interviews were carried out in each country with parents and teachers during the Design Workshop phase of the project. The themes applied within these discussions were broadly based on those included in the project's Design Kit (IO2) and were again adapted to reflect the cultural contexts in which data collection was taking place. In some countries, the development of these themes was supported by children and children facilitated the discussions. An example of the discussion points underpinning this part of the data collection is provided below.

Let's think about:

- skills developed by children from engaging with the internet
- the activities that skills learned on the internet can help with
- the role of teachers in keeping children safe online
- the problems encountered by children online
- the advice that teachers would offer to children to keep themselves safe online
- preventative measures to reduce the risk of their children experiencing problems online

Teacher focus group themes (design workshop phase)

Let's think about:

- skills developed by children from engaging with the internet
- the activities that skills learned on the internet can help with
- the role of parents in keeping children safe online
- the problems encountered by children online
- the advice that parents can be given to support their child to spend time online
- preventative actions that parents can take to reduce the risk of their children

Parent focus group themes (design workshop phase)

The views of teachers

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Three themes emerged from the teachers' focus group interviews with children concerning this topic: (i) skills development. (ii) decision-making online and (iii) emotional intelligence.

Teachers pointed out - especially the UK teachers - that through the use of the Internet children develop a range of skills, including skills for research maths, reading and recall. Teachers in the UK, Denmark and Belgium said they use the Internet as part of their classroom teaching. Teachers in Greece and the UK said they believed that children continually need adult guidance, useful hints and advice. Teachers said they thought that children must feel safe enough to be open:

> *"I think it's about being open as well. About what you come across on the internet"*
> (Teacher in the UK).

They said that children need help to build up their emotional intelligence to a point where they are not afraid to ask questions or ask for help without the feeling they will meet problems if they involve adults.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

Within our teacher focus groups and interviews at this stage of the project, three themes arose in relation to the above topic: (i) Social situations and conditions, friendships and relationships, (ii) The language is a learning process, and (iii) Risk of hacking.

Teachers highlighted that they know about some of the decisions and situations that children have to deal with in their online lives. They especially emphasised language used online, the risk of exclusion in social communities and having to decide on who you want to be friends with, and what condition and behaviour the children react to. During these focus group interviews, the teachers underlined the importance of children knowing who to be friends with. The Greek teachers said they advised children directly "*not to have friends online that you do not know in real life*" (Teacher in Greece),

whereas the teachers in the UK and Denmark said they do so are more indirectly by guiding, trying to point the children in the direction of what they, as adults, consider appropriate behaviour for children. They also indicated that their own use of the social media and network had given them an understanding that it feels good to get a response through online relationships and get followers on social media platforms such as Instagram, because it can afford positive self-esteem:

> "*But that's kind of … yeah … and then I actually find myself thinking that it's really nice to have followers*"
>
> (Teacher in Denmark)

The teachers discussed children's decision-making, awareness, tolerance and respect when engaging online. They mentioned that it can be difficult for children to decide on online friendships and with whom to be in a community (decision-making), for example, a situation on Snapchat, where one has been excluded due to behaviour that is not considered acceptable (awareness, tolerance, respect). The Danish teachers also discussed whether children can 'become friends' with their teachers on social media. The teachers indicated that they tried to separate their own private use online by avoiding being friends with their students online, although they said that children may not always have the same limit in the relationship, which may be a sign that the children have different perceptions of relationships in the online context, for example, what a friend is, and what you must have in common to be friends. In this context, teachers were also concerned about separating their own use of online platforms between being private and public. They thought that the children's behaviour and approach to online friending somehow forced' the teachers to take a stand on this when children ask their teachers for some kind of contact on Snapchat.

The Danish teachers pointed out that language is an important part of literacy and emotional intelligence, where children must be able to decode the communication that takes place online. The teachers highlighted this as an important learning process in the children's use of social media. The teachers also emphasised that children learn by going online, citing that experiences and literacy arise in the situations that the children encounter. This theme also emerged in the data workshop and the parent focus group. In their focus groups with the YPPs, the UK teachers used abstract reflections when discussing it:

"Because they can, because they're not in front of that person so they can't see their reactions like they can in school so it's being aware of what you want to say online and whether you would like that said to you."

(Teacher in the UK)

"It's the way things come across online as well…Yeah, if you speak in a very sarcastic tone, I don't know if anyone does that here…"

(Teacher in the UK)

"What you would say to them in person would you say, if you said it online would you say it to them in person. So you just need to make them aware of that. Just because they're online it doesn't mean that their feelings can't get hurt. Can't be, erm, hurt by others. I'm not sure how to explain that"

(Teacher in the UK)

In their focus groups with the YPPs, the Danish teachers shared what they knew about being cheated or the risk of being hacked. At first, they were very cynical but further into their focus group interview they showed more empathy by acknowledging that it is not always easy to figure out when you are being cheated, and you must therefore keep an eye on the children's behaviour, an issue of digital literacy.

YPP member: Have you tried phishing?
T3: I don't even know what that means.
YPP member: For example, if it suddenly pops up on your screen that you have won an iPhone 8, press it and enter your address or…
T2 : Not often it pops up, but then you just press the cross … you cannot be so stupid.
T2: There has also been that from Skat (Tax office). There has also been one that copied their logo and has printed out where people should enlighten… And that's more tricky because when it's an authority (from government). There has also been something about Mobile Pay. Someone we usually trust who writes to us. There, we are usually very authoritative, and believe that now I must do as they say. And so you cannot sleep in this situation…

(Teacher and YPP member in Denmark)

Teachers' participation and co-learning about the ways they can best support children's healthy online participation

Teachers participating in this stage of the project contributed a range of suggestions for how they could support children's online healthy participation. A key theme within their discussions related to the ways in which schools could impart information to children, through class based activities or assemblies. Teachers discussed the importance of supporting children to become active learners, focusing on giving them information that they could use in their decision making online. The value of regular sessions was also noted.

Teachers perceived themselves as informants, especially for parents, when they discover that a child has engaged in inappropriate digital use. However, they said they would only do this if there was a need to involve parents to resolve conflicts. Being the informant, according to the teachers, is not without conflicts, and it positions them as intermediaries between the children's online lives and parents' attitudes.

Another role that teachers believe they take on is diffuser in difficult situations concerning children and online use. They said they act when the children are involved in more serious conflicts or have violated the rules of the school or, in the worst case, state laws. At the time of the CyGen cycle in the UK, the participating school had learned of an outbreak of online bullying in the children's home lives and students and parents were involved. The teachers and head teachers had to formulate a solution, with no guidelines. As the teachers put it, they like to help or assist with help when the need arises during school hours.

During these interviews, the teachers emphasised what they considered poor or bad online behaviour and they recognised that there is a risk that things cannot always be changed on the web or in digital participation. The teachers highlighted that it is not only children's online behaviour of which they had to be vigilant.

Teachers' perception of parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this

Belgian teachers mentioned issues between parents and the school in relation to supporting the children's digital participation online. They did not think that the teacher

should be involved in all matters, and they should not have a knowledge of everything that the children do. In doing so, they also highlighted the parents' responsibility and their view that there is a clear distinction between what children do in school and in their leisure time. The Danish research team noted that the teachers they spoke to in Denmark thought parents should take on greater responsibility for their children's behaviour online. The Danish teachers saw parents, not teachers, as primary educators for their children's digital participation in many situations.

The UK teachers' conversations in relation to this aspect focussed on the importance of parents having an awareness of children's engagement. They highlighted examples including children using the internet in front of their parents, and parents and children developing open communications with each other, ensuring that children were supported with decision making in the digital world:

> *"...and the key is always tell your parents. Always tell your parents and you should never keep secrets from your parents if anybody ever asks you to keep a secret, then no, because you don't ever keep secrets from your parents you tell them everything. And you turn it off, yes, messages pop up, somebody requests you, message, erm, somebody messages you and you don't know them, you don't answer it. You don't answer it you turn it off, you tell your parents."*
>
> (Teacher in the UK)

The UK research team also pointed out that they learned throughout the project that in some households certain devices were kept within family areas, but that the number of devices that children increasingly have access to makes it difficult for parents to restrict all of them to particular spaces in the home. This is an area for consideration in future research.

The views of parents

Changes in perceptions of children's digital literacy, emotional intelligence and decision-making within cyberspace

Parents in all partner countries said that they regarded trust as central in respect of children's behaviour and decision making online. However, there was no consensus among parents on how trust may be enacted or about children's digital competences relating to literacy, emotional intelligence and decision-making. Parents' statements regarding trust contradicting were therefore contradictory. They said that they both

trust and do not trust their children and that they are checking and not checking their children's profiles. The Danish research team noted that this contradiction demonstrates the complexity of participating in children's digital online lives. Parents seemed to indicate that they are involved at a periphery level, rather than directly when it comes to their children's online participation.

The four research teams noted comparisons between parents' views at the early stage of the CyGen project and this mid-point. During the early part of the CyGen data collection, parents noted that their children were knowledgeable about technology, with ICT skills which often surpassed their parents'. During this mid-point focus group interview, this point emerged again. Parents noted that because children today are growing up with technology as a central part of their lives they are developing their capabilities and developing their decision-making skills as they go along, sharing knowledge through peers and siblings.

Changes in perceptions of children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

Two themes emerged from the YPP focus group interviews with parents in respect of this aspect: (i) Children are knowledgeable, and (ii) Involvement of children (improve awareness).

In the YPP focus group interviews with parents, parents said their children know more than they do about many aspects of online engagement and can teach them about technical, online behaviour and social awareness of what to share – and what not to share - in online communities. This view endorses children's awareness, communication and digital citizenship. Parents mentioned that their children's awareness of online communication may improve if they involved their children in online activity. For example, on Facebook, where the children can be involved in family relationships and participate equally. One parent also said that she and her son had made common rules together regarding tolerance and respect of others.

During the YPP focus group with parents in the UK a conversation was captured about the concept of online communities. This was not a theme which was explored by parents during the data workshop stage of the project. Within the session, parents' contributions suggested that they viewed rising digital communication as a potential risk to offline communities and engagement in outside activities. During the same focus

group, they also noted that digital engagement could enhance hobbies for children, for example cooking and football, as children could seek information on these topics.

Greek researchers pointed out that participating Greek parents' concerns and worries about the dangers of online gaming and social media were more evident in the YPP focus group interviews at this mid-point in the CyGen cycle than they had been in the data workshop earlier on in the CyGen cycle.

Changes to parents' perception of their own participation and co-learning about the ways in which teachers support children's healthy online participation

Our Danish researchers noted that the parents in this focus group in Denmark aligned with teachers in their YPP focus group to identify adults poor behaviour online. The parents were very clear in the YPP focus group interview in Denmark that they are aware of their own role and behaviour in supporting the children's healthy online relationships and participation. In particular, they emphasised that it is adults who are the worst online, and who often act with little consideration online. As in the YPPs focus group with the teachers, the children were generally surprised to hear this critique of adults by adults. Parents in the UK, Greece and Belgium did not identify this aspect during the YPP focus group interviews at this stage of the cycle.

Changes to parents' understanding of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this

Concerning this aspect, parents identified five themes in the YPP focus group interviews: (i) Parents and children online, (ii) Challenges and risks of the digital world, (iii) Opportunities of the digital world, (iv) Parental strategies for supporting children's time in the digital world, and (v) Challenges associated with monitoring.

Parents said they have experienced challenges that occur in online communication such as bullying or ugly words. They said they were keen to highlight some strategies to support the children's healthy online participation. The parents pointed out to the YPP children that they do not always think that they as parents must be involved or present when children engaged online, and that children have the right to a private life with the digital and social media.

For the most part, parents in the four countries said they are friends with their children on social platforms, where the parents themselves have profiles. In this way, they create a family community, but are also able to gain insight into their children's online actions. In Denmark, the children told the CyGen researchers that at some levels they find it embarrassing having family members as followers on social media. In some ways it might feel like a form of social control which contradict the trust the parents say they have in their children's online behaviour. Furthermore, Danish parents said they were concerned about being role models for their children in respect of online behaviour: they said want to embrace this position but that it may be quite challenging because there are differences in the way adults and children interact online.

In their YPP focus groups, the UK parents discussed a number of perceived challenges associated with their children spending time online. In line with the contributions of the UK parents in the initial focus group, parents noted concerns in relation to their children accessing – accidently or on purpose – inappropriate content, including the contents of some advertising campaigns. Parents noted that this was a challenge that they had little control over; they noted that age-inappropriate advertisements appear on otherwise child-friendly sites and applications.

A challenge that parents highlighted at this mid-point of the project was the abundance of fake news available online. Parents noted the importance of children being able to assess critically the content and validity of any sources of information they used, and to cross-reference information. In addition they discussed the importance of website providers and social media platforms in playing a key role here regarding verification of information shared via sites. Parents recognised that this may be challenging to carry out in practice and they made suggestions for how this could happen, for example via verification processes of celebrity accounts on popular social media accounts, and certification for reputable information on others. Parents also called for regular reviews of posts made by users of social media, alongside recognition that some improvements had been made in this area by some well-known brands.

Finally for this theme, parents in all four partner countries also discussed their concerns that their children may communicate with strangers online. Parents again noted the age restrictions for particular social media platforms which their children were not old enough to access, with one parent suggesting that this left their children without a safe online platform to socialise together. In response to this point, some parents noted that they preferred their child(ren) to use video chats rather than audio calls, in order that

their parents could see who was on the call in which they were participating. Parents said boundaries were also put in place in a number of homes where children were allowed only to communicate with people known to them offline.

Two sub-themes emerged in parents' focus groups and interviews at this stage of the project:

- Parental engagement with children and technology;
- Being able to 'find things out' online: educational and interest driven uses of digital technology.

Parents said they engage with their children's use of technology to support educational learning, hobbies and gaming. Parents explained that they would support their child in sourcing the information that was needed online – where this was needed – ensuring that it was age appropriate in a range of ways. This included using search engines and websites that have been specifically developed for children. Some parents reflected that these sites did not always offer the depth of information needed.

In addition to engaging in technology with their children, parents also explained that they use technology to keep in touch with them, mirroring the earlier stage of data collection with parents where this was also a theme. One parent also explained that technology was used within the home to enable children to keep in touch with family members who did not live locally. Both points are illustrated in the following example:

> *'My children use it to keep in touch with their dad when he's travelling to work, so they email in when daddy's asleep and then when daddy wakes up he sees it so he replies and then when they wake up in the morning and they get the message from daddy and there's no oh sorry they're in bed or they're doing their homework or they're at a club, it's very good for communication. They Skype their granddad in New Zealand as well so from that aspect it's bringing people closer that aren't distant street wise or in different countries.'*
>
> (Parent in the UK)

Parents noted that uses of digital technologies for educational and interest driven purposes offer positive opportunities for children. They recognised the opportunity presented by online videos for informing children as well as enhancing their engagement in offline activities. Parents also noted value in a child's ability 'to find things out' online, seeing the online space as a place to encourage creativity and self-led learning.

At this mid-point in the project, the UK parent participants shared examples of how they support their children's uses of the Internet, and they considered this part of their role as parents. The examples the parents shared at the mid-point focus group interviews were not as wide ranging as those they shared with the previous data collection stage, but they included monitoring (or as some parents described 'policing') time spent online, to observation of children's activities, and the promotion of open communication.

Whilst parents explained the range of ways in which they monitored their children's use of the digital world, they also noted the challenges associated with this, and the limitations of what they could do in practice.

> *'That's what worries me, I don't know how to police that. This is it you can't sit around and police them all the time and once they get to a certain age they're going to disappear off and do it on their own anyway so it's important that you trust in them and trust in their abilities to keep themselves safe.'*
>
> (Parent in the UK)

Parents recognised that it is not possible to oversee everything with which a child might engage in the digital world, and, just as was apparent within the earlier data collection, parents noted the importance of open communication with their children about the challenges of the digital world, sharing examples of when their children would discuss challenges that they came across online.

> *'You have to be interested in the tiny little things and then they just naturally come and tell you every little detail which sometimes as a parent can be frustrating, but equally if you know those channels of communication are open for the little things, the tiny things, the not quite so drastic things.'*
>
> (Parent in the UK)

One parent, in particular, noted how her own participation at the data workshop stage of the project had led to increased conversations with her children about the digital world:

> *'After the last CyGen meeting I went home and said to you two didn't I again, you need to remember that you cannot talk to anybody that you do not know in real life and I reiterated that. You do that, you can't go far wrong really.'*
>
> (Parent in the UK)

Some parents noted that they were unsure of how to approach these conversations, and others noted challenges in deciding how much information to share, and how much to retain:

> *'Talking to them again about safety and keeping themselves safe online is really important that they understand why we're whittling at them and we're not just being old parents we've actually got a valid point.'*
>
> (Parent in the UK)

Some parents noted that particular instances or experiences relayed to them by their children would instigate discussions about topics which they had not considered warranting discussions beforehand:

> *'I think sometimes it's when your kids hit a hiccup, something happens, then you think oh gosh I really do need to speak to them about that, sometimes that's when it hits home.'*
>
> (Parent, UK)

The views of children

Children's digital literacy, emotional intelligence and decision-making within cyberspace

The contributions of children during the Design Workshop offered four key themes associated with this topic: (i) Good production skills; (ii) Skills identified by the children; (iii) Challenges identified by the children, and advice to combat these challenges; and (iv) Online safety issues identified by the children.

The workshops and the exercises that the children engaged in during them allowed them to demonstrate that they had good competencies in digital literacy which including using digital tools and producing outputs with them. In the UK, these included:

- **Being digitally equipped: Developing skills for the future** :
  The activity it helps with, getting a job, and why is it important? So you can get money, food, water, and a house in the future so you can have a better life. (UK child)

- **Safe searching strategies:** Knowing how to find useful, age appropriate information:

  …if you're on the internet, look out for inappropriate language …, use a sensible search engine. (UK child)

  Sometimes it helps you with your homework, because if you don't know a method, it's sometimes better watching it than reading it because you can get the idea of what (to) do. (UK child)

- **Decision making:** Making decisions about safe (and unsafe) links online, and about how much personal information to share/withhold making decisions about safe (and unsafe) links online, and about how much personal information to share/withhold:

  (to) prevent viruses and to be careful online… it's important…It could spread to other devices, or to friends' devices. It helps to keep safe (UK child)

  Personal info, names, where you live, school, friends, and you could lose other important info like school or job work, contacts for people who don't live close, and it can cause stress. (UK child)

- **Keeping personal information safe:** Children were aware that posting certain information could enable someone to identify them. On a related note, some children noted the importance of knowing the capacity of the apps that they were using, for example some include a geolocation which can show others the user's location.

  When you're taking images of yourself don't like show your whole, like, what you're wearing, because maybe wearing your school uniform could show what school you go. But the three things you should think about is will it benefit you, would your parents allow you to do this, or are you sure you want to do it anyway. (UK child)

The following challenges of spending time online; and advice for other children in responding to these challenges where articulated by UK children, for example:

- **Managing unkindness from others:** A participant explained how to 'block' others when hurtful messages are sent.

- **Managing information for time immemorial:** Information posted onto the internet stays on the internet 'even if you delete it'. The children were aware that their digital footprint would be there for the rest of their lives.
- **The importance of not sharing too much personal information online:** The children were aware that posting certain information could enable someone to identify them. Some children noted the importance of knowing the capacity of the apps that they were using, for example some include a Geofield which can show others the user's location.
- **Availability of overage games and websites:** Some children said that they had played games which were for older children or adults. Their advice to parents in responding to this referred to parental monitoring of their children's internet use. They felt that children should be aware of, and use, child focused websites (e.g. YouTube Kids).
- **Not knowing who you are messaging through the internet:** Children were aware that unknown people may not be who they claim to be.

Students in Belgium generated narrative stories about online safety. The main topics these covered were:

- Hacking;
- Cyberbullying;
- Inappropriate content;
- Chat rooms in games (unkindness);
- Privacy (not sharing much personal information online).

Students in Denmark produced films. The main topics these covered were:

- Phishing in relation to sharing information;
- Participation in fake competitions on the web;
- Good advice you can do in the situations in question, such as talking to parents or other trusted adults;
- Digital violations such as sharing pictures, and who can help.

One of the girls on the Danish YPP had been touched by the stories she had heard about others online experiences. These stories were more important for at the time as the class was working on CyGen. The Danish YPP children were aware of how the online opportunities for forming relationships and communities both contain positive as well as negative aspects.

> *"It's just tricky if, for example, someone has no phone at all, then you can't be part of the community because you can't come to* Snapchat*."*
>
> (Boy in Denmark)

The YPP children considered it important that they find it easier to discuss personal issues with friends online than when they are together offline - and that this has both advantages and disadvantages. One of the children made several points about how she experiences the online communication as an opportunity that opens up another and more intimate communication than in the physical space.

> *" I think, that with Snapchat, I feel that on Snapchat I can write a little more to xx (girlfriend from class) than I could say to her in reality. E.g. if I was sorry, I could write "Oh xx I was sorry". Where to say it to her, I would say it in a different way, more in a fun way.*
>
> (Girl in Denmark)

The YPP children had spent time considering the grandmother rule since the last time and during the focus group they talked about it. They thought that the grandmother rule is a good rule, but not always a rule they adhere to.

The focus group discussion among the Danish YPP at this stage of the project particularly focussed on the age limits associated with social media use. Just prior to starting the YPP focus group, the children were told that Snapchat had been shut down on all their iPads. Activity among children from the 4th grade seems to be the reason why Snapchat had been shut down from all the children at the school. Discussion about this event took up a lot of the YPP focus group time and showed how these 6th grade children relate to children in 4th grade at their school. They considered age limits and which children may or may not be old enough or mature enough to act sensibly on digital media platforms.

> *"For example, they are not old enough to have it. Why can't they just adhere to age limits, because it goes beyond all of us who may well have it. (...) It's a shame that they use social media for such a chatter (refers to conflict with girls in 4th grade).*
>
> (Girl in Denmark)

The Danish research team noted that in the earlier focus group with the teachers they had said exactly the same about the 6th grade children who were now participating in the CyGen project.

In Greece, children produced dilemmas concerning online engagement:

- Group 1: Talking to strangers: Talk to your parents and teachers and never talk to people you don't know!

- Group 2: False (phishing) messages: Be cool, tell your parents and delete the message!
- Group 3: Personal data: Never give your name, address or other personal data to anyone just because they tell you that you won something (students put the example of winning an i-phone if you give personal data)
- Group 4: Unknown (misleading) web pages: delete the pages, don't be afraid to ask for help from an adult you know
- Group 5: Dangerous games: Ask an adult before you play a computer/video game!

Changes to children's views of teachers' participation and co-learning about the ways they can best support children's healthy online participation

Our observations during Design Workshop activities indicated that the participating children related to their teachers. This was particularly the case when they were dealing with the dilemmas and they advised us of the importance of support from trusted adults in their online decision making, particularly in situations that they deemed challenging.

Changes to what children think about the role of parents in supporting them to manage the benefits, challenges and risks of the digital world for children

Observations during Design Workshop activities indicated that the participating children related to their parents. This was particularly the case when they were dealing with the dilemmas and they suggested good advice on involving the adults in the online situations where children might be exposed. For example, digital violations in relation to sharing of images, and sharing their information where one should not or when one is cheated. Here, the children demonstrated an awareness of the importance of involving adults, and the value of trusting relationships with parents.

Additional findings at this stage of the project from our Danish research team suggest that children that we spoke to in Denmark often do not want - or find it difficult - to ask for help, because this would mean that adults would become involved in their online lives and get to know their culture. For these Danish children, their online lives are adult-free spaces and the children seemed to want to keep them adult-free, so they

expressed contradictions in their statements about the presence of adults in their online lives.

The Danish YPP pointed out that it can be embarrassing to be friends with - or have family members - as followers. One of the girls explained her experiences of older family members on social media platforms:

> *"About this with parents on the social (media). I just came to tell xx. That's because it's really embarrassing because my grandmother just got all the social media and starts to follow me.... little embarrassing."*
>
> (Girl in Denmark)

The Danish research team noted that the evidence the YPP presented seemed to signal a detachment process between children and their parents at the start of puberty. The young people are embarrassed about their parents knowing what they are doing online and want to keep their online engagement private from their parents. They continued to recommend however that parents should be aware of younger children's actions and decision making online:

> "*I don't even think the parents know what their children are doing on social media. Because if her parents knew it, then! I think parents need to know what their children are doing. Go in and ask their children what they do online and see it. For example, I think xx's mother and father would be shocked about what she's doing online. At least I don't think they know.*"
>
> (Girl in Denmark)

When asked what children usually do online, the YPP students in Greece replied that children, themselves included, like to:

- Look for images about school projects
- Use the Viber and Messenger applications in order to communicate with friends and send images and emoticons
- Watch and develop videos on Vimeo and YouTube
- Use Skype to talk to friends from other countries
- Watch their parents use social media (Facebook, Instagram and Twitter).

The Greek YPP children said they were looking forward to reaching 13 years old, so they could use social media platforms they were currently too young to use. Some of the group said they already had their own YouTube channel.

The challenging or unpleasant things that the Greek YPP group expressed about going online were the dangers of games such as Fortnite, misleading messages from strangers, the sharing of personal data and the dangers from downloading pictures. Things that YPP students found challenging or unpleasant in addition to those identified by their classmates during the Design Workshop included the issues of viruses and sending pictures, even to friends, because you do not know how the other person will use your images. In respect of the workshop filming the YPP students reported learning how to co-operate effectively, especially how to talk when being recorded. They also said that it was an interesting process as all students had to practice in slowing down their voices. They finally said that their most important lesson was that co-operation is a rather difficult task and they liked the fact that the teachers – group facilitators assigned specific roles to them and did not let them act as they wished during the workshop implementation.

Development and Testing phase

During the Development and Testing phase of the project CyGen team members worked with children, parents and teachers to trial outputs from the project, and to obtain their feedback. This included observing the delivery of example lessons (based on those in our Wrap Around Texts), observing the children's engagement with the Webapp's, and focus groups and interviews with the Young People's Panel, Parents and Teachers. Through these approaches, we captured data relating to the impact of the project and its outputs.

Observations

In order to gather data directly about the outputs arising from the project sample lessons with children were delivered*. In some countries – depending on the wishes of teachers – these were delivered by members of the CyGen team and observed by teaching staff and another member of the research team. In other countries teaching staff delivered the lessons observed by members of the CyGen team. This method of delivery enabled informed discussions between researchers and teaching staff in the data collection which followed (see below).

Delivery of the lessons were interspersed with group discussion and feedback to enable the capture of relevant data. The researchers noted key points of discussion to 1) feed forward to other countries in remaining Design Cycles, and 2) feed into evaluation of the collaboration. Feedback regarding the development and delivery of the CyGen project as a whole was also captured in this element of data collection.

*For practical reasons, it was not possible to test the Webapp in this way in our Danish host school. Data collection with children at this stage of the project focussed on their perceived impact of CyGen. The Danish research team also sought to gain insights into whether participation in the project and the YPP has changed perceptions or added new learning for the children.

Young People's Panel focus groups

Delivery of sample lessons, and engagement by children with the respective Webapp's, was followed by final focus groups with YPP members in each country. Focus groups lasted up to an hour in duration and were conducted as close to the Data Workshop as possible, ensuring that discussions were fresh in the children's minds. The aim of the

focus groups was to capture in the moment feedback from the children's experiences. They were verbally recorded and fully transcribed for analysis.

Focus groups and interviews with parents and teachers

Data collection with children was followed by a final round of data collection with parents and teachers. They were given access to the Webapp and supporting resources and their feedback was captured. Teaching staff involved in the delivery of trial lessons were also asked about this experience. Feedback regarding the development and delivery of the CyGen project as a whole was also captured at this stage. The discussions were verbally recorded and transcribed verbatim.

The views of teachers

Children's digital literacy, emotional intelligence and decision-making within cyberspace

Data from the teachers' focus group interviews at this stage of the project revealed increased awareness and wider impact concerning this aspect, but not in all four participating countries. In the UK, Belgium and Greece, teachers said they could see some positive changes, but this was not the case in Denmark. In the UK, one member of teaching staff who was interviewed had realised that children in the group were acutely aware of Internet safety issues:

> *"Their overall awareness has improved massively and they have shared that with others across the school so it has had a wider impact."*
>
> (Teaching Assistant in the UK)

Teachers in the UK were generally very positive about the Webapp, describing it as 'absolutely brilliant', 'very well done', and 'very good'. Features the UK teachers liked included the app's navigability, its accessibility for children, including younger children and its wealth of material and 'useful information'. The UK teachers thought the Webapp could be improved further by adding more features about a wider range of subjects, for example gaming and e-mails. They also suggested that more games on the Webapp would encourage younger children to interact more with it.

Teachers in the UK thought that the CyGen project as a whole had enriched the curriculum for their children and that it increased participating children's awareness that e-safety is important. They saw it as reinforcement of the e-safety teaching the teaching staff were already providing in school and they appreciated the value added by

the opportunities CyGen afforded for children to lead, present and teach each other - and others - about e-safety:

> *"It was very children run and children focused, it was just kind of left up to the children… it's been a very good process… children have been engaged throughout."*
>
> (UK Teacher)

The UK teachers said the children who had participated in CyGen '*talk about it all the time*' and they thought CyGen has enabled the children to verbalise their concerns about internet safety - for example shared images - with their teachers so that the teachers have been better able to allay children's anxieties. The UK teachers noted that children who participated in CyGen in the UK were more capable of explaining internet safety issues to others and that their understanding of internet safety is deeper than other groups they have taught.

The UK teachers thought that CyGen had led to a number of benefits for their children's non-cognitive skills development, including increases in confidence, ability to communicate and enhanced collaboration. The TA who was interviewed in the UK noted that CyGen had impacted positively on participating children's emotional intelligence as they now have a greater understanding of what might be damaging and are better tuned into online issues. She observed that they frequently raised internet safety issues outside of the project days and discussed what would be appropriate comments and responses.

In Belgium, teachers said they had noticed that students who had participated in CyGen talked with other school children after the both the workshops. They said that by being actively involved in this project, their students now paid more attention to online safety in general and might have a greater understanding of bad or dangerous things online. Belgian teachers noted that their students were now more self-confident in using computers and the Internet. The teachers in Belgium said they enjoyed this project, since they had felt they did not have enough knowledge about staying safe on the Internet. They said they were hoping for more cooperation with experts, so they could continue to be updated on this topic. They also said they wanted to use the tool in the future. Besides their own knowledge, teachers were also interested in training sessions on how to help their students. The teachers also said they found it difficult to stay updated about things happening on the Internet because it is constantly changing, for example, a couple of years ago pupils were playing Minecraft, now they are playing Fortnite. The importance of ensuring that the WebApp and associated resources are

clearly targeted to relevant age groups was articulated, in order that it matched the developmental age and understanding of the children concerned. Belgian teachers told us that some parents had asked them questions about the CyGen project, after students had talked about it at home. The parents had told the teachers that they found it valuable that teachers were educating their children about staying safe on the Internet, which reflects our earlier data in relation to parents' views collected earlier in the project.

Teachers in Greece suggested that the children were now more willing to do various activities other than games. The children felt more responsible, more careful and had less fear when going online. Another observation from the Greek teachers was that the children seemed more willing to work in teams and collaborate in order to produce something together, especially when asked by their teachers to do, but also in respect of using their creativity to create things and not only provide 'the right answer'. This finding indicates the participating Greek children's increased digital literacy and independence in their decision-making. The finding reflects CyGen's initial ethos to use child-friendly language in order to support the children to express their thoughts, ideas, feelings and worries.

In Denmark, teachers had not noticed a wider impact from CyGen project engagement. They still emphasised that they thought the children lack 'social' filters and that the children were still quite naïve in their online use. One teacher mentioned this in relation to an information search:

> "*I also had a boy who believed that the founder of Sony Ericsson was Sony for first name and Ericsson for last name*"
>
> (Teacher in Denmark).

However, the teachers in Denmark were starting to analyse the children's culture in more depth and were trying to recognise nuances and features in the children's digital culture, suggesting a different way of approaching working with children around healthy online digital participation. They continued to note a lack of source criticality in relation to children's information finding online; an area that they noted their pupils needed further support with.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

In respect of this aspect, there were also differences between the countries' data. In the UK, Belgium and Greece, the teachers were more positive. As one of our members of UK school staff noted, the CyGen project was well publicised within the school, the children and staff across the school understood the project and realised the importance of the topic, raising the agenda and level of discussion on related issues. In Denmark, however, the teachers mentioned that while the importance of a good digital community had been maintained at the participating school, no further initiatives or changes were in place, and there was no new systemic, structured cultural approach at the school.

Teachers' participation and co-learning about the ways they can best support children's healthy online participation

For this aspect, two themes emerged from the data from the teachers' post-focus group interviews:

(i) More awareness;
(ii) More training for teachers.

In the UK the project deepened the teachers' understanding of participatory and co-design approaches. They had been impressed by the children's continued enthusiasm. It had opened up conversations about Internet safety and about project work. There was now a belief that it was important to support similar initiatives. Teaching staff also reported growth in their own ability to support children's healthy online participation:

> *"I've got more awareness. They are at the heart of what's current and what's going on and as an adult you are not always tuned in. So I take a big steer from them."*
> (Teacher, UK).

In Greece teachers reported that the children seemed more willing to work in teams and collaborate in order to produce something together when their teachers asked them to do so. The teachers thought that the children had developed their ability to be creative and not only seek to provide 'the right answer'. Teachers in Greece thought indicated more awareness and emotional development among the participating Greek children.

In Denmark the participating teachers emphasised that teachers in general need more education in digital competencies. They said that in Denmark there have been some changes in the teachers' attitudes toward responsibility: the teachers have changed their focus from what children cannot do, to be more reflective about their own competences and responsibilities as a teacher, for example, preparing for some of the things that the children encounter.

Teachers' perception of parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and their own role in supporting this

In the UK, data indicated that the CyGen project had impacted positively by increasing openness, discussion and communication between children, parents and teachers. UK teachers also noted that their parents had been more proactive in contacting school to raise concerns about their children's online safety since the CyGen project began in the UK.

In Denmark, the teachers had also noted changes in children's management of the benefits, challenges and risks of the digital world, not only at home, but also at school. Among other things, the Danish teachers mentioned that today there are great expectations children basically cannot live up to. So they note that adults can be important role models. However, the Danish teachers indicated that in Denmark there is still a key issue in school-home cooperation. At the end of the project, teachers in Denmark still advocated the importance of parental responsibility for children's online activity whilst they are at home. In Denmark, there was development in the teachers' attitude to their own role in the digital education process, an awareness that the school is central, and that the expectations they have for the children do not always correspond with the children's decision-making.

The views of parents

Children's digital literacy, emotional intelligence and decision-making within cyberspace

UK parents who were interviewed by children who had participated in the CyGen project were positive about the Webapp, which they saw as 'child friendly':

> *"It's got lots of explanations, it signposts you to where the resources are. It's simple and clear and it's got lots of information."*
>
> (Parent in the UK)

One UK parent thought 'more activities would be great' on the Webapp. UK parents were positive about the Webapp characters, describing them as 'lovely', 'all different' and 'very good'. Parents in the UK also noted that the characters would be easy for everyone – especially children - to relate to.

The parents in Denmark, Greece and Belgium indicated at this end stage of the project that they had seen changes in their children's digital usage. Parents in Greece noted that their children had fostered more responsible behaviour towards the Internet, since they kept asking questions. The parents in Belgium agreed that they might think children are computer literate, but that internet safety goes beyond knowing which button to click.

Participating in the CyGen project has helped the children to further develop critical thinking towards the Internet and strengthened their decision-making. According to the parents the children are more able to think twice before they act, especially regarding the sharing of their personal data online. A parent in Greece also stated that:

> "*Practice with the CyGen App will show even more in the future as children will have the opportunity to investigate things in-depth.*"
>
> (Parent in Greece)

Parents said that improvements in children's digital usage had been more difficult with more complex aspects of online engagement, for example they thought that surfing YouTube remains a challenge as well as fake emails and phishing which are rather difficult for parents to control.

Children's digital citizenship, awareness of social and cultural difference, tolerance and respect for others

This aspect was highlighted by parents in Denmark. A particular theme that emerged at this end point of the CyGen project was an extension of the children's understanding of their own digital citizenship. The parents noted that their children were more concerned with social life online now and especially in relation to relationships internationally. One parent mentioned that her daughter who has participated in CyGen project as an YPP member has become aware of how her participation in CyGen is part of something bigger and an expression of digital citizenship.

> "*And she said: ' just think - some of what we are doing here might actually have an impact in the future'. She came to think of it at some point during the class participated in CyGen and said, 'that it is so cool that we are involved in an international project'*."
>
> (Parent in Denmark).

The Danish parents also stated that they have become more aware of their children's online strategies for communication and the development in their children's social interaction worldwide.

Parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and they, and teachers, have roles in supporting this

Two themes emerged in respect of this topic in the post-focus group interviews with parents:

(i) Strengthened conversations
(ii) Being a role model and parental control

Over the course of the CyGen cycle, conversations and dialogue between parents and their children in relation to develop children's digital literacy, emotional intelligence and decision-making seem to have opened up and strengthened. In Greece, parents told us that they see their children in a (new) role of a reporter (an expert) – and have learned to eliminate their own fear and from that see their own role as parents being more aware of their children's competencies. Before the project the parents "*...somehow felt embarrassed in front of our kids especially when it was rather difficult for us to promise in which ways we will protect them*" (Parent in Greece).

Danish parents also noted that the conversations between parents and children were strengthened through the CyGen project:

> "*The dialogue I have had with her, it has been ... it has just reach a higher level for me. Because she somehow also got it... and got some aspects in which she would never have got, if she hadn't been in this project*"
>
> (Parent in Denmark)

> "*... being able to say, try and listen to all perspectives and that he actually went in with to this project with an interest in internet security and such things. Now it is not just me being evil and warning he about the Internet at home*"
>
> (Parent in Denmark)

The Danish parents indicated changes in their perspectives on their children's digital usage. At the start of the project, they thought that they had talked to their children about online safety and good behaviour, and that they expected their children to follow the rules set for them. But during the project up to this point they found that the need for adult support is greater than they thought at the beginning of the project: this was also reflected in our data on parents' perspectives in the UK. Danish parents considered the importance of being role models for their children and how that recognition has become clearer during the project. They have realised that parents need to be more critical, aware and open for the digital usage of their children.

By the end of the CyGen project, parents in Belgium had realised they might need training on internet safety: they recognised that not only must they know how to stay safe online but that they also have to learn how to teach this to their children. The parents in Belgium very much appreciated the parents' guide in the Webapp and they saw the links to other organisations as added value.

In Greece, the parents also stated that they recognised a change in their role, especially in respect of parental control for children's online use. Greek parents thought their conversations with their children about digital usage had strengthened and were more open and they indicated that the CyGen app in Greece was heling them to feel more "safe" in their supporting role.

Danish parents also continued to highlight the role of teachers as incredibly important. They emphasised the importance of good cooperation between school and home. Danish parents had many points to make about the school and the teachers' responsibility in relation to being a school where iPads were allocated to children at an early age. One stated:

> *"So I still think that the school is the biggest challenge for this class"*
>
> (Parent in Denmark).

The Danish parents' post-focus group interviews revealed that the parents were critical of the school's handling of the students' digital lives:

> *"It's not conflict less. There will always be some conflicts. But it's more like that ... it might be that you might have had a specific approach, that is. As we see, the school*

has been absent. And it's not.... But it is also an approach. But that is perhaps not the best educational approach, one can say.

(Parent in Denmark).

"And that point once again to the need for dialogue. One thing is that we must have a dialogue with our children, but there are also a need for a dialogue between the adults. A dialogue between school and home?"

(Parent in Denmark)

The Danish parents wanted stronger collaboration and a strengthened conversation with their children's school about their children's digital education. Awareness of these points emerged more strongly during the CyGen project.

The views of children

Changes to children's digital literacy, emotional intelligence and decision-making within cyberspace

This section the report includes children's reflections on participating in the project and the co-produced digital education resources as well as reflections on their digital literacy emotional intelligence and decision-making online over the course of the CyGen project. **In the UK** this included the following positive impacts:

- (Learning about) 'Using kids You Tube and search engines';
- 'Learning how to manage myself online';
- 'Helped me to learn about e-safety – I have more knowledge now';
- (Developed a) 'better understanding of the specific dangers – e.g. of phishing and how this 'can be dangerous';
- 'The internet can be great way to express yourself but can also not be a nice place. CyGen and the app help you get the most from it and understand this';
- 'Improved my e-safety skills';
- 'Increased my knowledge about e-safety'.

Some children in the UK told us that taking part in the project had increased their confidence; both in general and when engaging with discussions about online digital engagement.

"I participate more (offline) now. In class I would normally not put my hand up, I would keep my idea to myself."

UK CyGen child

"I am 500% more confident – normally I would sit back and keep my idea to myself"

UK CyGen child

YPP children in the UK also told us that they had had opportunities to learn about and connect with people from different countries (including members of the broader CyGen team). They also expressed their enjoyment and sense of achievement from their involvement in the CyGen project which they perceived as having the potential for a direct benefit to other children. Favourite elements of the project, according to UK YPP members, included:

"Taking part in the (ME) conference and being interviewed for TV and the radio."

UK CyGen child

"All of it and especially the conference."

UK CyGen child

"I don't have a favourite part because every part of it was fun and very exciting."

UK CyGen child

"Taking part has been insightful and inspiring."

UK CyGen child

In Denmark, children's views about the positive impact of the CyGen project on their digital literacy, emotional intelligence and decision-making online over the course of the CyGen project were articulated in their reflections about the emotional damage that 'pranks' could cause them and others. The girls in the Danish focus group interview said that during the spring there had been a trend for the girls in 6th grade at their school to play pranks on each other.:

" There are a lot of girls in the class who make pranks … And that means that you end up not 'believing in any of the things they say. They make pranks on serious topics like: 'I am moving away', 'My father is in the hospital', 'My father is dead'.

(Girl in Denmark)

One of the boys added that it is a bit like "Peter and the Wolf": you do not know what to believe in. The girls explained how these pranks affected them and that they think a lot about them. They said that when they find out that it was just a prank, they are disappointed and frustrated.

> *" It's been a long time since ... I think it's 3 weeks ago. And I'm still thinking about it because I really want to tell them, but I can't just go to them and tell them to stop"*
>
> (Girl in Denmark)

The girl was considering whether she would address this issue at a class meeting, but she said she finds it difficult to do so.

Some of the YPP members in Denmark suggested that contributing to the project had limited impacts for them. Their contributions suggest that they framed their contributions as sharing knowledge that they had to help others, rather than as a learning experience for themselves: '...*We know it already. All the things we've talked about, we already know*." Others suggested that learning from the project related to sharing their understanding and experiences with each other: *"Yes, you have to remember to support each other*."

In Greece, participating in the workshops appeared to have influenced the Greek children by helping them to be more careful online, for example they said that they did not enter unknown sites or take other kinds of risks. They said they had also become more aware of age limits in games and looking at game reviews before playing. Regarding the CyGen activities, the Greek children said that they explored some interesting things which can help them enjoy the Internet. The Greek children pointed out that they have become more careful when entering new sites and ask for their parents' help. Members of the YPP in Greece extended this point by telling us about the importance of children using educational tools alongside their teachers and parents. The Greek YPP children said they were excited about being chosen to be part of the YPP because they had an opportunity to represent their classmates and feel like experts.

In Belgium, students said they were now feeling more confident. They indicated that they had now learned where they could find help when they are facing problems online. They thought the list of organisations that provide help is very useful. They also thought the Webapp gives them enough information about staying safe on the Internet. They found the links to other tools and organizations a nice bonus; it makes it possible for them to stay updated, even if the tool cannot be updated. Students in Belgium also

thought that it was important not only to learn facts, but also to learn how to find targeted information about saying safe while using the Internet.

Changes to the way the children talk about or view their digital citizenship, awareness of social and cultural difference, tolerance and respect for others

In the UK, children were aware of the need to be more knowledgeable and reflective about how they interact with others online. This was evident in the:

- Puppet Pals movies they generated;
- Ways they talk about parents needing to set parameters for them in order that they learn how to self-manage their digital participation.

UK children who were interviewed by their peers at school were all positive about how their CyGen experiences. For example, one child said:

> *"... It's given me a lot of boost of energy, exciting – and I love XXX (CyGen researcher) and all the other staff that's helped me through it – and it's great spending time with my friends and having the fun of it because it just was fun and... I think I'll miss CyGen a lot when I go to secondary (school)."*
>
> (Child in the UK)

Children in the UK were asked by their YPP peers what they liked about the CyGen app. Again, their responses were positive overall. One child described it as "a good app" and several appreciated that it helped them to stay safe online, commenting that: *"You can be safe online with the app."*

A number of UK children highlighted what they enjoyed specifically about the Webapp:

> *"The games are really fun."*
>
> *"You can go on YouTube with it."*
>
> *"I really enjoyed the app and it was very exciting to play."*
>
> *"(I enjoy) the characters and the quizzes because if you get the thing wrong you can try again"*

"It has lots of characters and videos on and it asks you questions."

Danish children reflected on the challenges associated with being online and reflected on different avenues of support open to them. They were still aware that they may not seek this help in practice should they need it. They were continually aware of how younger children needed more directive support and guidance. The issue of online communication and the challenges that may arise was also addressed by the Danish children who commented on the strategies they use when to manage negative online communication, including challenging the friend-perpetrator, ignoring it or showing to an adult. The Danish children referred frequently to their own perceived maturity in terms of being able to interact appropriately online, contrasting this with their experiences when younger, for example:

"You know more now than you did in 3rd grade."

(Boy in Denmark)

Changes to children's perception of teachers' support for children's healthy online participation

In the UK, children indicated that they had become more aware of the ways that teachers support children's online participation in school. For example:

"They kind of have changed - they have made us more aware of how we use iPads and what we access in school"

UK CyGen child

"Teachers will 'be nice" (i.e. are approachable.)

UK CyGen child

In Denmark, children's comments regarding this aspect revealed a complex picture in which they shared some practices with teachers and kept others to themselves. This included using humour (including swearing with and at friends) as part of shared 'in-group' humour which would not do, or necessarily admit to doing with teachers. For example:

"... When you want to share a private joke e.g. if you call one of your friends a bitch, you wouldn't write that to your grandmother, but it's just a private joke you have with a friend. 'You are a bitch', that you can write to a friend, even if you wouldn't write that to your grandmother."

(Girl in Denmark)

In Greece, the children pointed out that although their teachers (and parents) already knew a lot about the internet and could help them (the children) they learned even more from engaging in the CyGen project, especially about how to interact with the children in an online setting. Belgian students also reported that teachers could help, when they are facing problems and were positive about the links to organisations provided in the Webapp.

Changes to children's perception of parents' appreciation of the benefits, challenges and risks of the digital world for children and their understanding of how children manage these and the role of parents in supporting this

In the UK, children asked each other whether the project had changed 'how parents support you' as well as thoughts about how parents could best support children. Their responses reveal a range of parental approaches to children's digital participation and children's ideas about this, suggesting in some cases a sophisticated understanding of the challenges facing parents in supporting their children's internet access and safety:

> *"Mum and dad are more careful and strict about how I'm connecting to social networks using apps on my phone."* (UK child)
> *"Parents are more aware of need to be safe."* (UK child)
> *"My parents don't let me go on games for older children."*(UK Child)

> The important role if parents was also iterated by teachers in the UK, for example:
>
> "*Parents need to understand that children need to engage with the online world - let them learn what they should and should not look at – be independent but not too independent so that they are safe - and take risks - this can be challenging for parents, what they should and shouldn't be looking at."*
>
> (UK teacher)

In Denmark, children discussed their expectations of adults in this YPP focus group interview with the Danish research team. In the focus group interview, the Danish children said they did not want their parents to be focused on their everyday online life. In particular, three boys in the Danish YPP articulated clearly that they keep their

parents, especially their mothers, at a distance suggesting continued challenges for this group in sharing information with parents. This is reflected in The YPP groups comments that the most surprising aspects of their focus group interviews with parents and teachers were that "...*they (parents) had many different opinions*" (Girl in Denmark)

In Belgium, during their YPP post-focus group interview, Belgian students said they had found it interesting that parents can also use the web app. They said they had realised that it would help parents to know what children think is important about safe internet and that this may facilitate conversation between parents and children about staying safe online.

In Greece, the YPP children stated during their post-focus group interview that they were very careful when downloading songs and files and that their parents seemed to be controlling everything now especially when they enter YouTube. The Greek children said they had found that their parents had become more aware - and in control - of their Internet usage.

Observational data, including researchers' reflections

Overview of Data

The final stage of the CyGen Design Cycle was the test and the children's engagement with the tool and the final evaluation stage was observations of these elements. The four participating countries conducted the final evaluation in different ways that were appropriate for the contexts in which they were working. This section of the report reports the diverse findings drawn from the four participating countries: UK, Denmark, Belgium and Greece.

The key findings from the UK testing of the Webapp app and wrap-around text are as follows:

- Group work using the app and wrap around text suggested that children's understanding of online opportunities and challenges continues to develop with their engagement with the project.
- Children clearly articulated their understanding of the opportunities and challenges of the internet, are aware that it is a place to have fun, connect with friends find information but also the need to safeguard against risks and how to do this.

- Children reported that the app and involvement in the project had supported their emotional and digital literacy in ways which helped them to make informed decisions about how they go online.
- The Puppet Pals activity in which children applied their knowledge and understanding to work together to create a series of Puppet Pals movies demonstrated children's:
  - Digital literacy and technical competencies: e.g. at adapting the technology to create a short movie);
  - Communication skills: working together to create a concept for each movie to share with the class
  - Understanding of 'being kind online' (digital etiquette') and how to manage broader challenges.
- Children evaluated the design and functionality of the app positively, seeing it as a tool which they would use in school and at home with siblings.
- Children evaluated their involvement in the project positively, describing the ways in which they felt they had benefited (raised confidence) and the skills they had developed as co-researchers and designers

The key findings from the Danish testing of the Webapp and wrap-around text are as follows:

- Silent, nonverbal knowledge about online participation based on experiences (a language of silent knowledge)
- Uncertainty about younger students' understanding of challenges and risks
- Ability to support the younger students through the tool – showing that they have acquired the learning through participation in the project
- Growing understanding of the design intention of digital artefacts
- Importance of co-developing rules for online behaviour to improve ownership (but particular criticism of the 'grandmother' rule)
- Need for adult support and a strengthened collaboration between school and parents on online behaviour - especially for younger children
- Understanding when bad language is part of the game and when it is not.

The key findings from the Belgian testing of the Webapp app and wrap-around text are as follows:

- Had been looking forward to seeing the final result of the Webapp;
- Were very enthusiastic about the Webapp;
- Showed a high level of engagement and concentration when they worked with the Webapp;
- Understood that the web app is not a real game, but said they had hoped to see more interactivity and gamification in the game;
- Were happy that their ideas had been included in the Webapp;

- Were really proud of their work;
- Were really proud that they had contributed to creating an important tool for other children.

The key findings from the Greek testing of the Webapp app and wrap-around text are as follows:

Difficulty:

- Most students said that the tool is 'Too Easy';
- One student said navigating the tool was 'Easy Enough' but that the dilemma posed difficulty for her.

Topicality:

- All students said they thought the tool was very relevant and topical.

Flow:

- All students said they thought the tool was OK and exciting.

Tool Layout and Navigation:

- They would have liked more interactivity with the game in the form of videos and more vivid images (visualisation)
- The True/False mode of providing answers to the dilemmas helps them decide about the answer
- They would have liked more sound effects and a more child-friendly appearance of the App.
- They would have liked to be able to check a box when giving their answer.

Some of the children who were interviewed by their peers made suggestions for how they thought the Webapp could be improved further – and essentially, they wanted more of what is already available. One child suggested there could be more activities and in the future more characters could be developed. The team are addressing this in sustainability plans.

Key findings

Children in all four countries have lots of ideas about the ways in which the online environment can support their connection with others, learning and play, knowledge which is derived from their lived digital engagements including with family and friends. They were sensitive to cultural and other differences, articulating high levels of tolerance in their online communication and are able to develop strategies to help them to navigate and communicate online. At the same time children across each partner country expressed the need for more information and support from trusted adults particularly when dealing with complex now-and-here situations. They told us that they particularly value a safe non-judgemental environment – in school or at home - in which to explore their online experiences. This includes the input of trusted adults who are sensitive, honest, open and helpful when needed, for example in dealing with messages from strangers, managing personal data, phishing and viruses;

Parents and teachers articulated the ways in which they sought to support children to engage safely and confidently with the online environment including:

- Creating an open, approachable classroom environment where children feel able to talk about their experiences including challenges;
- Teachers and parents were keen to develop new ways for home and school to cooperate to help keep children and young people develop their digital confidence.
- Teachers and parents found handling online safety issues for children very complex, requiring an ongoing process of setting up rules, supporting children and creating a space to engage in dialogue about situations as they emerge for children;
- Both parents and teachers said they wanted more information and support to keep up with developments.

Children, teachers and parents across the four partner countries responded positively to the design cycle activities and the co-designed educational resources, in particular:

- The ways in which the inclusive participatory design provided opportunities for open fruitful conversations about online opportunities and digital safety;
- Opportunities for dialogue, which were designed in to the Webapp were reflected upon positively by children, teachers and parents who commented how

it supported children to develop their knowledge and skills, providing a safe space to do this in dialogue with other children, teachers and parents.

- The playful participatory design in which children's views and experiences were encouraged and respected as digital experts in their own right, including by wider audiences (journalists, policy makers and leaders in digital safety);
- Opportunities to create content, learn new skills through engagement with the project (film-making, public speaking) and scaffolded by the Webapp and wraparound educational resources (creating digital content, animations, documents and webpages) supported children to develop digital literacy.

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Appendices

Appendix 1: Observations of test and tool engagement with children (UK)

Overview of activities and data

Activity 1: Introducing the app and 'lesson'

- The aim of this activity was to re-familiarise the children with the app they had co-designed and to explore children's perspectives on the usability and usefulness of the app including the design and functionality of the app.

- Participants – all 26 children (Young people's panel, Quality and Design teams)

- The activity was organised as follows:

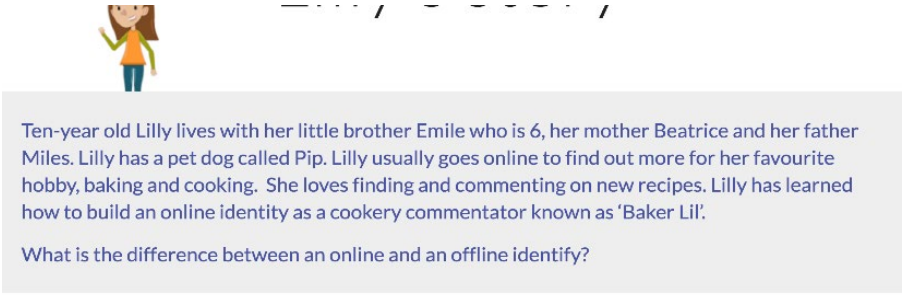
1.1 Re-familiarise the children with the app.

- Here the children worked in pairs (an iPad between two). The children were given the log-in details where they spent time in pairs browsing the app at their own pace.

1.2 Delivery of a 'lesson' using the wrap around text.

- The lesson was delivered by a member of the team using the white board in order to scroll through the app and wrap around text (designed by the UK team for teachers and parents to support the delivery of the app). The lesson followed the format of the wrap around text https://sites.google.com/view/cygen-app-resources/home This involved children working in pairs and in whole group work on the following activity in the wrap around text displayed on the whiteboard:

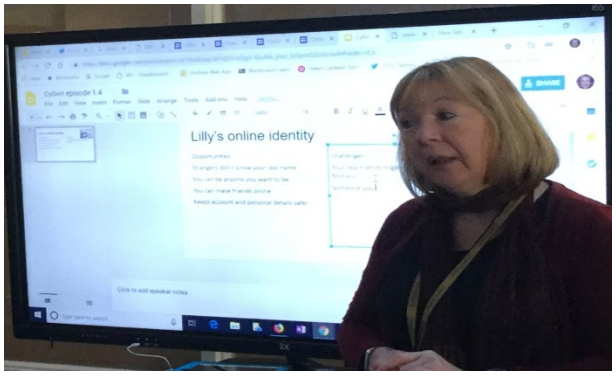
Figure 1: screenshot, wrap around text



- After the 'teacher-researcher' introduced the children to the scenario in figure 1 the children called out their responses to the question 'What is an online identity' which the team typed up on the whiteboard using google-doc (**Figure 2**).

- This activity supported children's enthusiastic participation, children generated ideas about the challenges and possibilities which demonstrated a sophisticated, reflective understanding of digital identity (**Figure 2**) which reflected children's digital literacy, emotional intelligence and decision-making within cyberspace;

Figure 2: Children's responses 'What is an online and offline identity?'

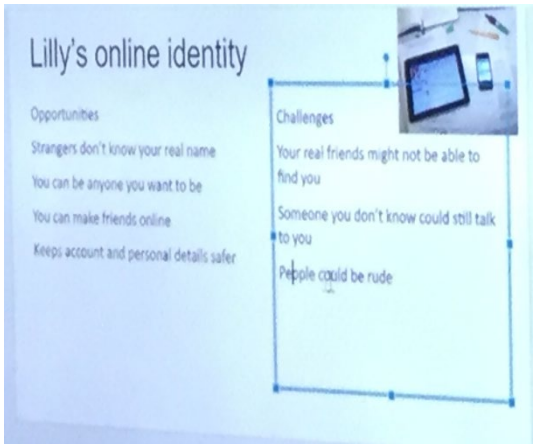


Opportunities:

- Strangers don't know your real name
- You can be anyone you want to be
- You can make friends online
- Keeps account and personal details safer

Challenges:

- Your real friends might not be able to find you



The class continued to work through the wrap around text with the teacher researcher providing opportunities for children's active involvement. This included watching the video of Molly and Harvey as a group and then applying their leaning through digital 'making' activity as set out in the wrap around text:

'Use the Puppet Pals app to show two online personas being kind online. Think about one of your own hobbies and design two online personas. Use PuppetPals to create an exchange between them using characters, backgrounds and a voiceover. ' (UK Wrap around text, https://sites.google.com/view/cygen-app-resources/home)

The children greeted this activity with excitement; the two observers recording children's enthusiastic body language and facial expression (*smiling, leaning forward excitedly, glancing at each other excitedly about the prospect of making and sharing mini-movies*) and quickly engaged with the task of generating short digital films using the

Puppet Pals app. The activity (**see figures 3 and 4**) was highly successful in engaging the children in a digital creative activity, demonstrating and supporting evidence for:

A/ Changes to children's digital literacy, emotional intelligence and decision-making within cyberspace;
B/ Changes to the way the children talk about or view their digital citizenship, awareness of social and cultural difference, tolerance and respect for others;

- **Digital literacy and technical competencies** (e.g. at adapting the technology to create a short movie);
- **Communication skills**: working together to create a concept for each movie to share with the class
- **Understanding** of 'being kind online' (digital etiquette') and how to manage broader challenges. They used characters from films (e.g. Finding Nemo, Harry Potter), as well as cartoon fish, unicorns, pandas and 'pizza guy' as a means of creating humorous scenarios to talk about online safety.
- The **humour and sophisticated application of the technology** to share online safety messages with others is evident in the content, dialogue and titles of the movies e.g. 'Prof P teaches J dog'. The key messages in the films including:
  - Not sharing passwords and personal information
  - Where to get help (frequently from mums),
  - Being stranger aware
  - Being 'kind'

The observation notes show a high level of engagement, cooperation and enthusiasm and creativity in the creation and sharing of the movies.
The design and content of children's films indicated a high level of knowledge and problem-solving and well developed digital literary skills to create and communicate their ideas. The children's creations can be viewed here https://www.youtube.com/user/helencaldwell1/videos?view_as=subscriber

Figure 3 Children creating Puppet Pal movies in pairs

Figure 4: Sharing the PuppetPals movies with the class: 'Pizza- Guy'

Appendix 2: Observations of test and tool engagement with children (DE)

A/ Changes to children's digital literacy, emotional intelligence and decision-making within cyberspace;

Silent, nonverbal knowledge about online participation based on experiences
The students in the 7th grade were given the responsibility to guide the 4th grade students through the test of the tool. This required that the 7th grade students had skills to communicate some of the digital challenges and ways to deal with them. Throughout the design process, the participating students (now 7th graders) proved to be more aware of what knowledge and competencies they already mastered in digital behaviour and where they experienced being equipped to navigate in social contexts on the Internet. A consciousness they were not able to articulate until late in the process an ability we experienced they got through the work with the design processes - and the dialogue about the dilemmas generated during the process.

Form a language for silent knowledge
Through these processes they got a common language that expressed their silent knowledge based on experiences from their own actions and acting in social contexts on the web.

Throughout the process, we experienced a development of their language on digital behaviour in which they were also able to articulate what they were good at - and which competencies they lacked when it comes to cyber safety.

This was evident in one case in the design process, where we presented them with a number of concepts in the field of Internet security. Here we observed that they lit up and committed themselves by actively asking what the concepts meant and how to deal with these challenges.

Examples include concepts such as digital footprints, hacking, identity theft and phishing. We also observed that the students discussed these concepts during the breaks. In the work with the design team, the students expressed that it was within these themes that they experienced a need for learning, new insight and ability to act. When we presented the tool for testing, they also showed the most interest in the elements of the quiz that were about internet security. Several of the students went

back in the quiz to see the different possibility of answers and which answer were most correct.

Uncertainty about younger students understanding of challenges and risks
The 7th grade students stated that they experienced an obvious need for the development of the younger students' competency in digital literacy, emotional intelligence and decision-making within cyberspace.

B/ Changes to the way the children talk about or view their digital citizenship, awareness of social and cultural difference, tolerance and respect for others

Ability to support the younger students through the tool – showing that they have acquired the learning through participation in the project
We saw signs of this several places in the test of the tool. As described above, children were at the centre of the actual test, which also required the 7th grade students to take responsibility for the testing process and interaction with the younger students.
In particular, the test with the dilemma was a difficult part of the test, as several of the dilemmas were of a personal matter which made it a sensitive issue for the younger students to discuss in front of the older students.

Here, several of the older students showed competence in supporting and respectfully helping the 4th grade students through the questions, and when the students found it difficult to answer, the older students chose to go into the discussions, thereby supporting the younger ones. We saw that because they themselves had been through several of the dilemmas - and therefor knew some of the less sensitive topics and ideas on problem solving – they could incorporate their previous experiences of reflecting on digital issues and showing their ability to act in a respectful way with the younger students.

A growing understanding of the design intention of digital artefacts
We also observed that the students were not familiar with concepts within usability and testing within design prototyping. They did not know words like flow, navigation, gameplay etc. Through the dialogue about these concepts an awareness that digital artefacts are not just obedient instruments but is designed with an intention of who the user is, how the content is to be selected, accessed and presented, which data is

collected, and perhaps which consumption patterns can be identified, emerged within the students.

We observed a new understanding among the students on how the digital artefacts they use are designed and thus a first-order understanding of the possibilities and consequences of digital artefacts.

C/ Changes to children's perception of teachers' support for children's healthy online participation

Importance co-developing on rules for online behaviour to improve ownership (here especially a criticism of the grandmother rule)
We probably saw it most clearly in our CyGen multiplier event, where the students were invited, and in several cases, they were involved in the discussions. The students described that they felt it was important that learning resources on cyber safety were to be developed for the younger students.

Need for adult support and a strengthened collaboration between school and parents on online behaviour - especially in relation to the younger children
Because they had been involved in the work with the design of this tool they had become aware that there were many younger students who needed more knowledge and skills in online behaviour and ability. A need that they expressed that this learning tool could help cover but at the same time, some of the students expressed that a learning tool also requires teachers to continue the cooperation with their parents in the future, to help students - and be at the forefront when challenges arise on social media.

A student mentioned that it was recommendable if the adults to a greater extent participate in smaller children's digital lives in order to be able to offer support for children healthy online interaction - and contribute with knowledge and reflections - and maybe also rules when the need arises.

Another student mentioned that it might be a good idea to develop rules together with the younger students, so they feel the ownership of the rules - and that might prevent the younger students from using - and abusing the grandmother rule - "*it must be our own rules that are meaningful and reflected into our world and reality*".
During the break we also heard a couple of the girls talking about one of the educator working with the 4th grade students. That maybe he should do more digital activities

with the younger students - rather than always just playing ball in the hall. They thought that because he had a good relationship with some of the students who had difficulty in digital communication he might have access and thus the ability to support these children's healthy online behaviour by playing online games with them.

Understanding when bad language is part of the game and when it is not

Some other boys added that there may also be differences between which digital arenas you are in, and in some arenas, it is part of the game that you say bad things about each other and the things you do in the game. It is just for fun, and there is usually a silent meta-communication in the game that this is part of the game and when the game is over, the language and the tone of voice used is also over. Some of the students said, there is a need for adults helping the younger students with this - so they get an understanding of when and when not, it is okay to communicate with bad language.

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