Praesidio safeguarding

# Improving media literacy in disadvantaged communities: educating children and young people about persuasive design

## Evaluation Report

Ofcom

Making sense of media

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# Executive Summary

This project has been commissioned by Ofcom as part of their Making Sense of Media programme of work to help improve the online skills, knowledge and understanding of UK adults and children.

The project set out to develop the online media literacy skills of children and young people in disadvantaged communities through enhancing their understanding of the impact of persuasive technology on their digital lives. We sought to increase children's digital knowledge of how social media, video sharing platforms and gaming are designed to keep their attention. The purpose of this was to encourage children to think more critically about what fuels their use of the online world, helping them to resist certain design features and improve their experiences. Research on children's digital literacy tends to show that children in general often struggle to interpret the veracity of content they view online as well as the different ways in which the online environment operates as a commercial ecosystem.[1] Specific research on children who experience disadvantage suggests that they are more at risk of online harms and of having a narrower and less fulfilling online experience.[2] This project set out to explore and test whether giving children an increased understanding of how online services are designed (and why they are designed the ways they are) would benefit them, and translate into their exercising more empowered and conscious use of online services. To deliver our sessions on persuasive design we developed an educational toolkit which aims to provide something different to the typical teaching method used for discussing the online world in schools. Recognising that children's digital lives are very personal and important to them we wanted to provide opportunities for them to reflect on their own experiences as well as to respond to and discuss new ideas. By using a creative and interactive methodology our aim was that the children involved would feel encouraged to share their own perspectives whilst also learning new information and concepts which might help them frame some of their online experiences.

As such, we developed a toolkit of educational sessions, with resources such as easy explanatory tools, games, discussion topics and creative activities. These were to be delivered in the following contexts:

- Small intervention group engagement
- Involvement of vulnerable or disadvantaged individuals
- Flexibility to be led by educators and community workers
- Relaxed teaching and learning environment
- Space allowing for kinaesthetic activities, games and discussion-based learning

1 Ofcom (2023) Children's Media Use and Attitudes.
2 Internet Matters Refuge and Risk: Life Online for Vulnerable Young People

# Key Successes

## Our chosen topic - evidence of impact

We found that pupils engaged strongly with our chosen topic of persuasive technology. In the majority of cases, pupils thrived from learning how this intentional design impacts their online habits, app use, screen-time and daily lives. They were interested in how the technology works and also how it affected them in the real-world. There was strong evidence from the qualitative data that in two out of the three intervention groups children's knowledge of the topic had increased substantially and that they had a better understanding of why their digital experiences were as they were and how the internet functions as a commercial landscape. There was also evidence that they took on board this learning to reflect on their own use.

> *"It's quite interesting. We've been talking about the algorithms and how the apps make money off my data." (Boy, aged 12)*

## Delivery methods - discussion based

Offering the children and young people a space where they could talk openly about the online world with each other and adults in a non-judgmental setting was greatly valued. None of the participants had experienced an intervention like this before where they had the opportunity to discuss their online experiences with adults and ask questions. The open and relaxed nature of the project was something they really valued, and they reiterated this throughout.

> *"It's very fun and we actually got to communicate with each other, and we got to talk about how things actually work. " (Boy, aged 12)*

## Kinaesthetic learning and 'fun'

A key success of our intervention was the excitement and engagement it generated with some groups that were quite challenging to educate in more formal ways. The children in all of the groups found the sessions fun due to being active as well as relevant and topical to their lives. Our toolkit therefore offers a strong educational approach on this issue for alternative educational interventions or informal settings. Activities and tasks involving movement around the room were highly popular to all pupils involved in our project and facilitated openness and connection within the group.

> *"The sessions have been different from our normal classes and way of learning, more engaging than what we normally do. It's made me think more about what I'm doing online." (Girl, aged 14)*

# Key Challenges

## Additional needs and/or developmental barriers to effective learning

Despite most of our interventions working well - our youngest group struggled with some of the content due to its complexity and their own additional learning needs. With this group we had to alter and further differentiate our materials to make these sessions work. Overall, we found that we needed to reduce the complexity of the concepts for our youngest group that also exhibited the most vulnerabilities.

## Weaknesses of the quantitative data

Our interpretation of the success of the project is largely based on the qualitative data - specifically our conversation with children and young people about what they have learned and how it has helped them to think differently (and the appreciation for the session). Whilst our quantitative data showed broadly positive trends and direction for the learning - we experienced difficulties with the administration and timing of the questionnaire and shortcomings in in how the children engaged with it which we felt made it a less convincing measure.

## Uncertainty as to the extent to which improved understanding shaped behaviours

Children and young people strongly conveyed to us an improved understanding of the issues that they learned about in the sessions. However, the question of the degree to which this lastingly altered behaviours in the longer term remains an open one in the scope of this study.

# Contents

# Background to the project

This project has been commissioned by Ofcom and delivered by Praesidio Safeguarding as part of Ofcom's Making Sense of Media programme of work to help improve the online skills, knowledge and understanding of UK adults and children. It was one of thirteen projects commissioned by Ofcom in December 2022 to improve media literacy skills across four cohorts:

- Older adults
- People living with disabilities, learning disabilities or cognitive impairment
- Children and young people
- Communities experiencing financial disadvantage

Praesidio Safeguarding is a globally recognised, specialist online safety agency, that believes that children have the right to be safe and to thrive in the digital environment. Praesidio works with stakeholders across the digital policy landscape to enhance children and young people's safety and wellbeing in the online environment. We conduct in depth participatory work with children and cutting edge research and insight work that directly feeds into policy, product, and educational innovations. Our Making Sense of Media project aims to explore how we can foster children's positive experiences online through the development of effective online media literacy approaches.

In particular our project seeks to understand whether the education of young people on the topic of 'persuasive technology' can enhance their online media literacy and critical thinking skills, and subsequently have an impact on their online habits. It also seeks to understand whether taking an interactive and discursive approach to education on this topic helps young people to engage with it successfully, through active learning and creativity.

## 'Persuasive technology'

Ofcom's 'Making Sense of Media' programme aims to develop the digital knowledge, awareness, and the resilience of those living in disadvantaged communities. This project - commissioned by Ofcom as part of the Making Sense of Media programme - aims to educate children and young people about 'persuasive technology' and help them to understand how this affects their online experience. 'Persuasive technology' refers to the intentional design of social media and gaming platforms to extend user engagement, keep them from logging off or encouraging them to return again and again. Children and young people have been found to be particularly susceptible to the pressures of this design, due to developmental norms that mean that they are less able to resist persuasive pressures involving social obligations to peers or expressions of their identity.[3]

3 5 Rights Foundation - Disrupted Childhood: The cost of persuasive design (version 2, 2023). Five years on from the original in 2028, this report re-looks at the impact of persuasive design on children. Disrupted-Childhood-2023-v2.pdf (5rightsfoundation.com)

This project supported children and young people to take a step back from their online use, to consider their habits, what drives them, and also how they are affected by them in order to seek to encourage more conscious and critical use.

## Target groups

Research shows that children and young people in areas of financial disadvantage are more at risk of digital deprivation than their peers in more affluent areas.[4] Children in disadvantaged areas are less likely to have access to secure digital devices and safe internet access, as well as having lower attainment levels of online media and digital literacy, and increased risk of harm from online use. Perhaps most significantly, many young people are without a good network of adults that can support them with digital literacy or help them to navigate online issues.

For this project we engaged in three different intervention groups within two different high school settings in some of the most deprived local authority areas in Wales; Newport and Caerphilly, both located in South Wales. This is based on the Wales Index of Multiple Deprivation 2019, with both containing three of the ten most deprived Lower layer Super Output Areas (LSOAs) in Wales. Both areas are listed among the ten Welsh LAs with the highest percentage of LSOAs in the most deprived 10% of all areas in Wales, in the overall ranking of areas experiencing multiple deprivation (as well as being in the top ten specifically in relation to income and education).

## Delivery and participants

Across the two targeted regions of Newport and Caerphilly, we conducted three delivery rounds, referred to as intervention groups. We explained to schools that our aim was to work with vulnerable young individuals who would benefit from support with digital literacy. The intervention groups were organised and delivered as below:

| | Region | Gender | Age | Numbers | Dates |
|---|---|---|---|---|---|
| **Intervention group 1** | Newport | Mixed | 13-14 | 14 | Summer term 2023 |
| **Intervention group 2** | Caerphilly | Boys | 12-13 | 12 | Autumn term 2023 |
| **Intervention group 3** | Newport | Mixed | 11-12 | 7 | Autumn term 2023 |

4 Internet Matters Vulnerable Children in A Digital World (Adrienne Katz & Dr Aiman El Asam)

Prior to commencing intervention group 1, the Newport school supported us in facilitating both pupil and practitioner 'test panels' in May 2023. Specifically, in these panels we introduced pupils (of various ages from Years 7 to Year 9) and teaching staff (of various year groups and subjects) to a selection of activities that we had designed. These activities showcased a range of different learning approaches, exercises and games that explored the concepts and features of persuasive design.

During these test panels we simulated the tasks and exercises with the pupils. This gave us important insights into what would work in our intervention groups, which activities pupils would respond positively to, and which ones were less effective or appealing. These one-off sessions allowed us to gain valuable feedback on our project and make relevant adjustments and edits before commencing the programme of intervention groups.

## Intervention 1 – Newport school Year 9

Our first intervention group was with 14 Year 9 pupils at the Newport setting in mid-June, across a series of 6 weekly sessions. The majority of this group had experienced difficulties online, were vulnerable individuals or presented challenging behaviour. Before commencing intervention group 1, we were provided with a small overview of some of their situations. These ranged from; having phones confiscated, parents coming into school to discuss problematic phone use, previously sharing inappropriate images online, having strict screentime limits following excessive use, and living in the care system with conflicts at home around online safety and use.

## Intervention 2 – Caerphilly school Year 8

In November 2023, we started intervention group 2 at a single-gendered Caerphilly high school setting with a group of Year 8 boys, for a series of 7 weekly sessions. This group were the least vulnerable of all of the groups and had been selected as 'Digital Leaders'; representatives in each form group who help peers and teachers with digital issues in the classroom. From initial discussions with the school, we established that these pupils would subsequently share their newfound knowledge with peers.

## Intervention 3 – Newport school Year 7

In November, we returned to the same Newport school for intervention group 3 with a smaller group of 7 Year 7 pupils. In this group the school had specifically chosen these individuals to be involved, identifying them as vulnerable or in need of digital literacy education. They all presented behavioural issues, or social and communication difficulties.

# Our aims and approach to delivery

Through this project we aimed to develop an effective way of educating about 'persuasive technology' that engaged children in discussion and developed their knowledge. We set out to achieve this through the course of testing and refining the intervention with our groups. At the same time, we also wanted to build an educational toolkit that included our teaching methods and activities that teachers and youth workers could pick up and use to deliver easily to young people. We wanted to make our toolkit available to others as a legacy of this project.

## Encouraging sharing and self-reflection

The experience of 'persuasive technology' is pervasive for the vast majority of children and young people but is often not something that they have been encouraged to notice or think about. In asking children to think deeply about this topic in their own lives we wanted to find a way of engaging with them that would allow for greater connection and two-way sharing with us than through traditional lessons. Whereas a traditional approach to teaching this subject might be to simply explain how technology is designed to extend user engagement and outline the features of this - we wanted children to have the space to themselves reflect and identify the things that keep them hooked on their screens and to share with us the positives and downsides of this experience from their own point of view. We wanted to understand their experiences as well as to give them information that might help them make empowered choices about how they wanted to manage their own digital lives. Our aim was to be non-judgemental and develop a method and approach that allows young people to think critically about their online use, be relatable, accessible, whilst also recognising the positives of their experience.

## Creating accessible and replicable resources

As above, we wanted to create a way of approaching the topic of persuasive design in a way that would be accessible to others who would be interested in delivering a session of this kind. For this we created an easy-to-use toolkit which contains the games, exercises, and discussion topics we used and provides guidance notes for teachers and youth leaders to run similar sessions with the children they work with.

Through our work at Praesidio we have found that children and teenagers respond well to interactive educational styles where they are encouraged to share their own experiences and dilemmas of being online and talk openly about what is important to them. We have found it can work well for them to do this in groups where they can interrogate issues and discuss and learn together.

As a result, our toolkit set out to include the following:

- open group discussion opportunities
- questions and activities that aim to prompt reflection on different scenarios and develop critical thinking
- active and kinaesthetic learning exercises
- co-creation opportunities with peers, to embed and develop learning

We wanted to create a fun and informal atmosphere, that encouraged working together and for those involved to feel safe and able to freely share their thoughts with each other and the adults facilitating the sessions. Our aim was for them to share ideas and problem solve together.

The finished toolkit is something that has changed over the course of the project, with our learning from each of the three intervention groups leading to its further development and refinement. A copy of the final toolkit has been shared with this project report.

# Evaluation

Our intervention groups were a way of testing our methodology and toolkit and answer our set of 'Key Evaluation Questions' (KEQs) that formed a base for what we aimed to understand through the project as a whole. These KEQs were broken down into assessing the 'impact' of our project and the 'process' of our project (i.e. what worked well, less well or could be improved).

## Praesidio's Key Evaluative Questions:

### 'Impact'

Were participants better able to identify persuasive design technologies and the ways in which this shaped their online experiences?

If they are better able to understand and identify persuasive design strategies and how their content, and interactions are formed through these, does this actually change their online habits - or make them more likely to resist these technologies?

### 'Process'



How well did the toolkit, the ways the session was run, and the exercises and tasks keep children interested, engaged, and motivated?



What did we learn for the future about effective ways to approach and educate children about these issues in a way that is engaging, and which connects with their experiences?



What other lessons can we take forward to improve our work with young people in future?

In addition to our Key Evaluation Questions, we also developed a fuller evaluation framework that had a number of immediate and medium-term outcomes.

## Immediate outcomes:

### Children and young people:

- Have a better understanding of persuasive design.
- Have improved understanding of why certain aspects of being online make them think and feel a certain way.
- Are better equipped to challenge the problem or resist certain pressures.

### Educational practitioners and youth group leaders:

- Buy-in to the project and approach.

## Medium term:

### Children and young people:

- Think more critically about how content is driven to them and the design features on many platforms they are using and the impact these have.
- Think more critically about what fuels their use of the online world.
- Are more confident about spotting and resisting persuasive design.
- Manage their online experiences better.
- Improve their experience of the online world.

## Measuring impact

We aimed to measure the success of the project and approach through gathering both qualitative and quantitative data. Data about the 'impact' and 'process' of the project was gathered through individual or small group 'question and answer interviews' as the project was in motion. We also conducted a whole-group Q&A session during our final sessions, covering further questions and aiming to understand how they felt about their learning across the project now it was complete. This Q&A process, both during and at the end of the project, provided useful qualitative data.

In addition to our qualitative data which we gathered during and after the sessions we also had a small amount of questionnaire data. This aimed to assess the impact of the project through two participant questionnaires. In all three intervention groups the first questionnaire was completed in Session 1 and aimed to gain a baseline knowledge of the pupils' understanding of the topic and also of their online daily habits. The second questionnaire was completed in the final session of the intervention, and served as a comparison to the first, with the aim of assessing whether our project had made a difference to pupils in these areas. These questionnaires predominantly assessed through quantitative questions, but some questions allowed pupils to expand on their answers and provide qualitative data.

### Limitations of the questionnaire data

The questionnaires were intended to form a key part of our evaluation but having used the questionnaires within the interventions we have reflected that their language and the density of information was challenging for some of the children. As a result, we found they were limited in helping us to evaluate the success of the project.

The decision for participants to complete the questionnaire at the start of session 1 served the purpose of assessing their prior knowledge of persuasive technology, before we entered any discussions or learning on the topic. However, the level of written work and the subject matter within it was quite daunting for some pupils both in processing the meaning of the questionnaire in the short time available and the fact that it potentially felt like an assessment. Although we did a lot to verbally reassure participants that we were not making judgements on their online use, we think it may have induced some nervousness in some, and we found participants often speeding through the pre and post survey questions.

Despite the caveats above, we include a snapshot of some of the questionnaire findings for each of the three intervention groups which show the pupil responses to some of the questions and how these differ between the pre and post questionnaires. Despite the limitations of the questionnaire data, it does nonetheless contribute to understanding outcomes and supports some of the qualitative insights derived from other evidence sources.

## Report Structure

We have structured this report around our three individual intervention groups, which are as follows:

- Intervention Group 1: 14 year 9 pupils, mixed gender
- Intervention Group 2: 12 year 8 pupils, all boys
- Intervention Group 3: 7 year 7 pupils, mixed gender, ALN

The findings within this report have been structured by intervention group, rather than by outcome. This is to reflect the unique needs of each group, each of which presented their own challenges, resulting in different learning outcomes for each cohort. By presenting our findings in this way, we are able assess each group's educational journey, and comment on the value added to learners in a way that is relative to them and their cohort. This structure also helps to address some of the different ways in which they responded to the learning materials and exercises.

# Findings

## Intervention group 1 – findings on impact and process from the qualitative data

**Year 9 pupils (13-14 years old) in a mixed gendered high school setting in Newport.**

### Summary

Of the full group of 14 participants, a handful of them did not engage consistently week by week due to other pressures at the point in the year when the group was held. However, most individuals maintained their attendance and showed enthusiasm for the content, our methodology and working with us. Our qualitative data suggested that they emerged from the intervention group having had a positive experience, in which they had started to reflect on their online use and developed their knowledge of the inner workings of their favourite apps.

### The topic of Persuasive Technology

The pupils responded very positively to the subject matter and were able to think carefully about their own online use - discussing their favourite things to do online, the apps they used and the time they spent - which often became extended without them thinking about it. Overall, the topic proved interesting to the pupils involved, and they engaged well in the activities and discussion about it.

> *"It's good to learn about how the internet works and the bits behind the technology that we use every day and to see how it works." (Boy, aged 14)*

> *"I've found the sessions interesting. There are things I don't know about. The topic is different too in a good way." (Girl, aged 14)*

### Discussion based learning

We found that the discussion-based learning was a success for intervention group 1, with the positive feedback from children suggesting that we had provided a much-needed platform for them to discuss a topic so prevalent in their daily lives, in a healthy and constructive way. In our discussions with them all of the participants expressed that they valued this reflection which they had not experienced before. Key to this was providing an open and non-judgmental space for pupils to talk about their digital lives and share their feelings about it, and how it shapes their lives.

> *"Yes, makes me realise about my future self." (Boy, aged 14)*

In order to facilitate meaningful discussion among the whole group we gave the young people the opportunity to write their answers to questions down first, before entering a discussion as a whole group. Although a simple approach, this allowed pupils time to process their thoughts, without fear of judgement, which then meant they were more ready to share with one another in a group discussion. It was clear that pupils then went on to enjoy their conversation about personal online use, including the quieter members of the groups. Individuals expressed to us that they really engaged with discussion as a way of successfully learning, both with us as experts in the area and from each other.

> *"Yeah! Because instead of writing on paper you speak to other people about it and share thoughts." (Boy, aged 14)*

> *"Yes, it's good to talk to others that are not teachers too." (Boy, aged 14)*

## Kinesthetic learning

The active-learning approach through kinesthetic learning exercises was a very impactful part of our methodology with this intervention group. Getting the participants moving around the classroom immediately in session 1 removed the feeling of a traditional lesson and created a more relaxed feeling, whilst also allowing pupils to warm up their thoughts and start engaging.

> *"I've thought [it was] fun, interesting, new and I've liked to participate." (Boy, aged 14)*

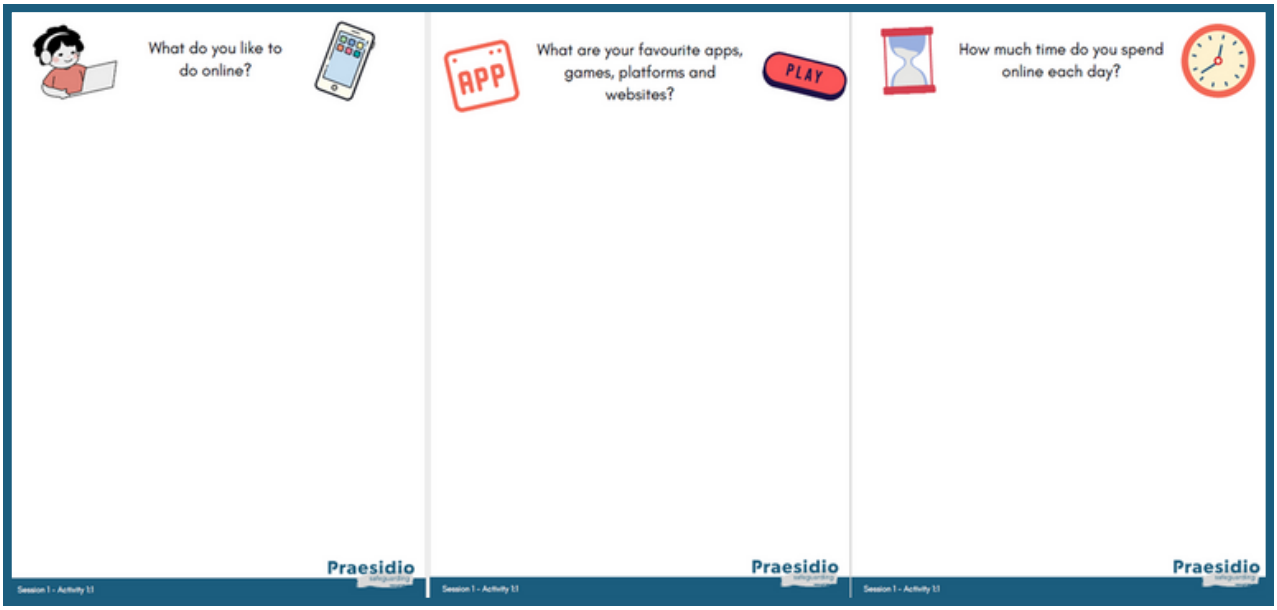
> *"I think movement is better to learn. It helps to keep my brain active." (Boy, aged 14)*

> *"We don't normally do things like this in other classes so it's a nice change." (Girl, aged 14)*

> *"It's more fun so you enjoy it more, so you make memories, and the knowledge is just in there now." (Boy, aged 14)*

Some activities throughout the project did involve worksheets (a more traditional school approach) where we felt they were more appropriate, for example for individual and reflective tasks. However, for the most part we strove to give the pupils something different, with the majority of activities involving some element of movement or interaction with props or learning tools, and discussion.

**Posters from Activity 1:1 of our toolkit.** These were placed around the classroom and pupils were encouraged to anonymously contribute their ideas by placing sticky notes with their responses to the questions on each poster.




## Co-creation

Pupils also valued working together and we were keen to have varied opportunities for collaboration to come up with their own ideas throughout the project. The toolkit features different ways young people can work together, from quiet and more thoughtful paired work to co-creative tasks. Pupils generally responded well to all these tasks, especially where they could work with friends.

The final activity of 'create your own social media campaign to promote healthy online lives' proved a great way for pupils to put their newfound knowledge into something tangible, and it also helped us to assess how much of our education had been absorbed and retained by them. Pupils enjoyed being creative with this, working with digital media, working with friends and some responded really well to sharing their education with younger pupils and being responsible for raising awareness of this subject area.

> *"I think this is wicked. It's been the most fun lesson so far." (Boy, aged 14)*

> *"Working on your own is boring and lonely and I find it harder. It's good to be able to talk about what you think when you're learning." (Girl, aged 14)*

> *"I like learning with others, it's fun, quicker and you remember more." (Boy, aged 14)*

Example of Year 9 pupil work from the "Create your own social media campaign to promote healthy online lives" activity:


Do you find yourself scrolling on TikTok for hours? Did you know this is because of a new feature called "automatic scroll"? In other words, "infinite scroll", which means it does not involve new web pages and it's ongoing, so you do not have to use your hands to scroll to the next video. Most of the time it can make people lose track of time. To stop that you can put a timer on your phone for about 30 minutes, because sometimes you can get into a trance and want to watch more and more. I think that putting a timer on your phone is a good idea as it will stop losing track of time from happening.

Another popular co-creation activity with intervention group 1 involved group work and peer debate. There was a lot of excitement around this activity, and a big factor in this was the chosen theme of a popular reality TV show. This was a success with intervention group 1 as it allowed them to learn about the real-world impact of algorithms and echo chambers in a fun way that was relevant to their lives.

*"The [debate activity] was my favourite because it was good to see what other people thought and to see if they had the same opinion as me. It was cool to see that nearly all of us thought the same thing about Love Island and chose green plates and only one person chose red. It was interesting to see." (Boy, aged 14)*

Intervention group 1 was largely successful in engaging pupils in our methodology and chosen topic of 'persuasive technology', but there were some weaknesses that impacted engagement from some pupils and their ability to gain a full understanding of the topic.

### Attendance

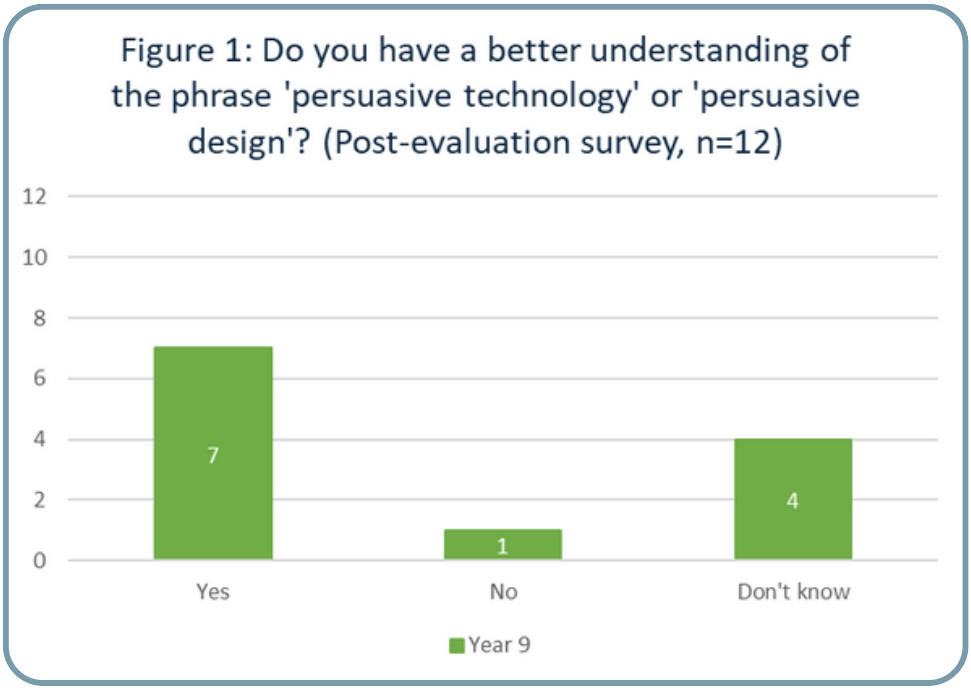
Inconsistent attendance proved to be one of the main challenges with this intervention group. Many of the 14 participants missed 1-2 of the weekly sessions and a small group of 3 or 4 participants missed more sessions. This meant it was very difficult to ensure everyone had received a full education on each topic discussed, which was challenging when much of the session work relied on building on the previous week's knowledge and understanding.

### Concepts

During intervention study 1, we realised how challenging and complex some of the concepts we covered were for the teenagers we were working with. A key example is our exploration of how social media apps and gaming platforms generate money, referred to as "the attention economy". Session 2, which aimed to explain this concept, involved too much information being delivered at the start of the session which meant our participants struggled to concentrate. As result we refined the toolkit to allow more time to fully explore the attention economy in more interactive ways. We also decided to split the content of this session over two sessions going forward, thus creating 7-session projects for intervention groups 2 and 3.

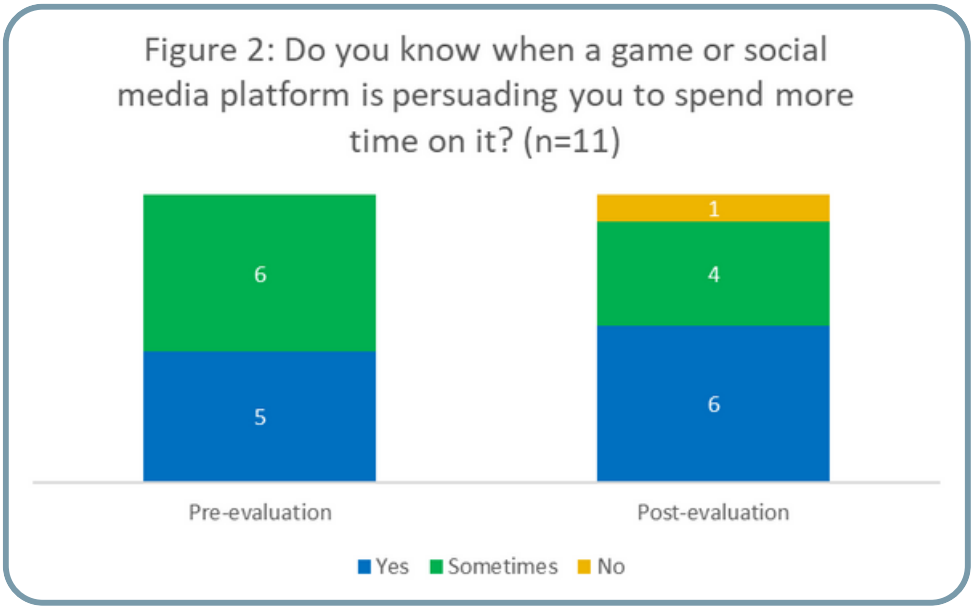
## Intervention group 1 - findings on impact from the questionnaire data

Unfortunately, our placement of the post-project questionnaire in the final sessions of the project, caused some problems in the completion of it. With Intervention group 1 we had particular issues with attendance which impacted on the post-project questionnaire. In group 1 we had a small group of 3-4 participants that missed a number of the sessions return to the final session and complete the questionnaire. At the same time, a core group that had benefitted missed the very final session with us and did not complete the questionnaire.

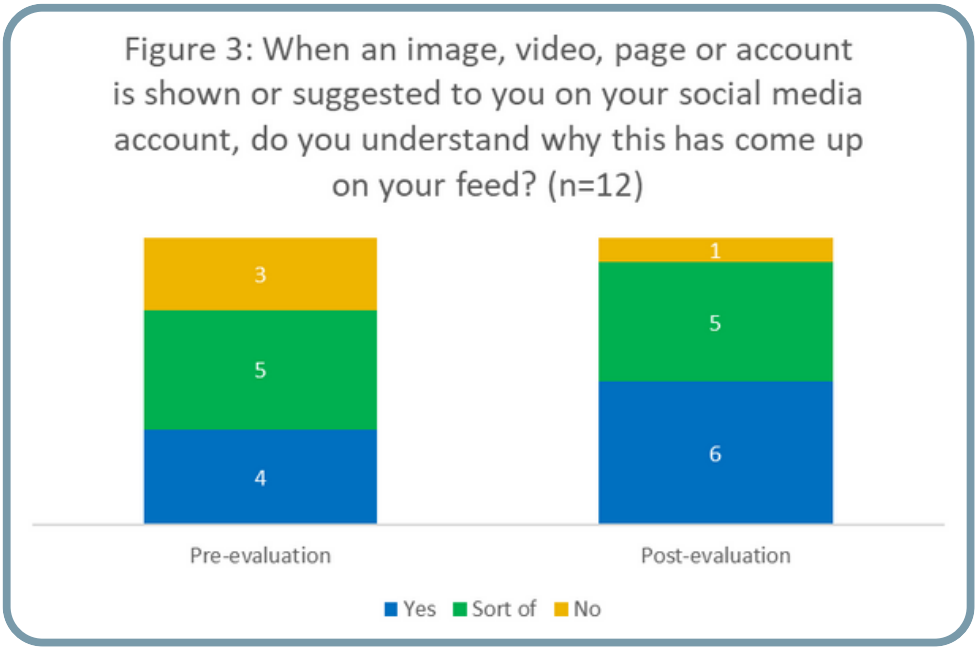



Although the survey results provide evidence of some positive changes by the end of the project, we felt that the Year 9 responses did not fully reflect the growth in understanding which comes across in the qualitative data. Nonetheless, 7 out of 12 participants reported having a better understanding of the phrases 'persuasive technology' and 'persuasive design', and only one young person said they did not have a better understanding (Figure 1).

In follow-up questions, we asked children to explain persuasive technology, which was designed to help us assess how much children improved versus their perceived improvement. Definitions provided indicated that many children knew how to describe persuasive design technology, indicating that improved understanding matched self-reported improvements.



The quantitative data did not show a meaningful difference for the Year 9 group as to understanding whether they are being persuaded to spend more time on platform (Figure 2). However, our discussions suggested that this group may have been more susceptible to overestimating their knowledge beforehand and then perhaps developing a greater understanding of some of the features that work persuasively.




Understanding of algorithms and how content is suggested for users, generally showed some improvement for Year 9 in the survey data (Figure 3).

However, Year 9 survey responses did not appear to reflect the growth in understanding that participants conveyed verbally during the sessions or the learning they were able to express afterwards as part of the qualitative data capture. We think that some of the discrepancy is related to the attendance difficulties faced by the participants.

Year 9 children did convey via the open field parts of the survey some of the positive ways that the sessions led them to be more knowledgeable about how their data was being used to influence them online.

> *"Because it helps me realise if I'm being persuaded to spend money." (Boy aged 14)*

> *"Made me question how much of the information is true." (Girl, aged 14)*

Overall, children generally conveyed in the survey responses that they had become more critical of the information they consumed online through the lens of persuasive design and the content algorithm.

## Intervention group 2 – findings on impact and process from the qualitative data

**Year 8 pupils (12-13 years old) in a single-gender (boys) high school setting in Caerphilly.**

This intervention group were by far the most engaged of all three groups and really seemed to thrive in the sessions. Attendance was very strong in this intervention group, with only a few absences for illness on occasion. As 'Digital Leaders' for their forms, the pupils involved were already familiar with a number of digital topics, which meant they were engaged and interested from the start. The qualitative data showed that all of the pupils in this group came out of the project having developed their knowledge of persuasive technology, expressing this particularly strongly in the social media campaigns that they created.

### Methodology

Intervention group 2 connected with our project methodology in a similarly positive way to intervention group 1. They particularly thrived with the discussion-based learning and were very comfortable sharing ideas with each other. The conversations throughout the sessions with this intervention group were thoughtful and interesting. The group also really enjoyed the kinaesthetic and co-creative activities as alternatives to traditional schoolwork, but equally accessed the more traditional learning elements (worksheet-based tasks effectively).

> *"We're always talking about something, and it is quite fast paced. There isn't lots of writing involved. There is more talking and less writing, it keeps you engaged. I've not been distracted by anything else. (Boy, aged 12)*

> *"I find that when I'm doing something practical, I learn and take things in better." (Boy, aged 12)*

> *"I like to work with other people as I like to get different points of view." (Boy, aged 12)*

### Group size and dynamic

The group size of 12 consistently attending participants worked well for this group, as it was small enough to allow for contribution from all, but big enough to allow for varied viewpoints and conversations to be shared.

> *"I prefer with a group but a small group. If it's too big it can get crowded. I can talk to other members, and you can get your point across and have better discussions. Fewer people mean fewer people messing around." (Boy, aged 12)*

The group was friendly with one-another and comfortable working together, enjoying paired work and really having a lot of fun in the team-work activities that involved kinaesthetic learning.

> *"I prefer [working] with other others. I enjoy having the communication with friends and helping them, and them helping me if I don't understand something." (Boy, aged 12)*

The pupils were able to interact with us, the topic and activities really successfully showing genuine interest and enthusiasm.

## Understanding complex concepts

Our exploration of 'the attention economy' with intervention group 2 used a variety of learning mechanisms to help pupils absorb and understand the information provided. This session used visual learning tools like the flow-chart below, kinaesthetic, and team-work exercises, as well as a short individual written exercise. All of these learning opportunities were supported by discussions between each other and with us as facilitators.

The re-development of the attention economy session (and related activities) for intervention groups 2 and 3 worked well. It ensured that pupils had an accessible knowledge of this process. If they needed a quick reminder in the future sessions, the flow-chart was an effective tool for this. Pupils were able to recall the 'the attention economy' really well as a result of these changes, and also commented positively on their education on this topic.

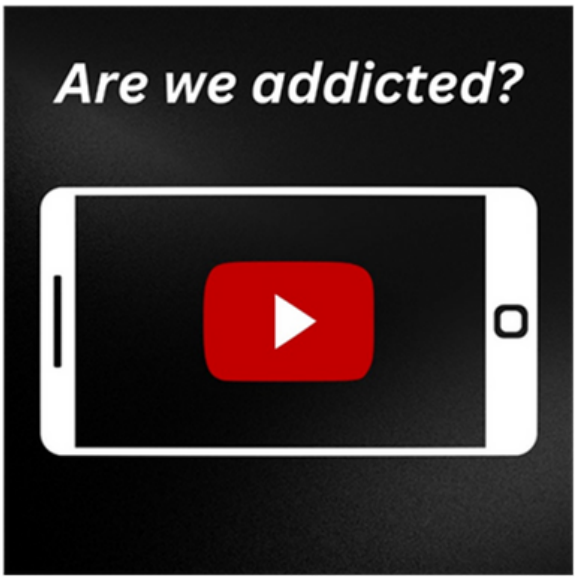
> *"The apps take your data, put it into algorithms, sell data to advertisers who advertise products you might buy." (Boy, aged 12)*
>
> *"Attention economy. You're giving them your attention, time and focus and that is how they are making money." (Boy, aged 12)*
>
> *"It's fun. We get to talk about things that we don't know about on the internet, but we don't really know what is going on and it helps us see. We have learnt about the algorithm and how social media companies make money. It's clarified a few things for me. You can tell it's powerful. I left my phone running on a gym video but now they [gym videos] keep coming even though I scroll past them." (Boy, aged 12)*

Once the group's collective understanding of this concept was established, the subsequent topics fell nicely into place and the group could comprehend where other topics, like persuasive design features, sat within the world of 'the attention economy', or how they were impacted by it.

## Quality of creative exercise

The final creative activity of 'create your own social media campaign' proved very successful with intervention group 2. The pupils were extremely focused on creating their campaign and felt that it solidified their learning about persuasive technology as they asked us questions and responded well to constructive feedback about to how to develop their ideas further.

Example 1 of Year 8 pupil work for the “create your own social media campaign to promote healthy online lives” activity:




**Have you ever found yourself not being able to quit scrolling or watching videos on YouTube?**

This is because many social media apps actually have secret techniques that can make you addicted. Some persuasive techniques that YouTube uses are things that make you engaged such as subscriptions or likes. The subscriptions make you more engaged in a creator and sends you notifications whenever she/he uploads. Notifications make you want to check your phone more thus making you more addicted. Autoplay and infinite scrolling makes it hard to quit from the YouTube shorts.

**How can it affect your health?**

YouTube can give you a false sense of reality which can make you jealous of other creator’s materials which slowly makes you sad. The notifications can make you feel left out if you don't check them and if you are so addicted to scrolling, that means that you will slowly have less attention span.

**How can we practically make a change?**

There are many ways to stop or limit your time on YouTube such as setting time limits on the app. If you never subscribe or like a video, you will feel less engaged and that means less addicted. You can turn off the notifications on settings apps and only watch long term videos so you can make your attention span longer.

## Trialling the use of games

We also had an opportunity before progressing onto the social media campaign, to test an interactive online game with the pupils in this intervention group. We were provided with Chromebooks by the school to access the 'Blooket' [5] classroom engagement game, which involved an element of fun and competition (which the pupils loved), as well as providing a way of assessing pupil knowledge on persuasive technology. This lesson gave us an opportunity to see what they had understood but we also used it as a springboard to further discuss and explore topics with them.

The trial of the game was a great success with pupils enjoying the freedom to choose whether to work individually or in pairs, however they felt happiest. The group played it three times with different questions on the topic presented to them in each round, which allowed them, and us as facilitators, to explore many areas covered by our project. As a whole, the pupils' scores increased each time they played; an indication that the game worked in solidifying and enriching their knowledge on the subject. This experience gave us an idea of how the toolkit content could be adapted through the addition of games, which could prove particularly popular with younger pupils or pupils with additional needs. The toolkit content could be differentiated and simplified for these pupils, with the hope of being effective in capturing attention, encouraging engagement and fostering learning.

Intervention group 2 responded very well to all aspects the topic of persuasive technology and our methodology. As a test group the only shortcoming was that they were a single-gender group – so it did not provide insight into the dynamics of a mixed group (or a group of girls). In addition, the fact that the pupils were 'Digital Leaders' meant that they were a conscientious group already interested in digital issues.

When asked, the boys generally felt their peers would enjoy the project as much as them.

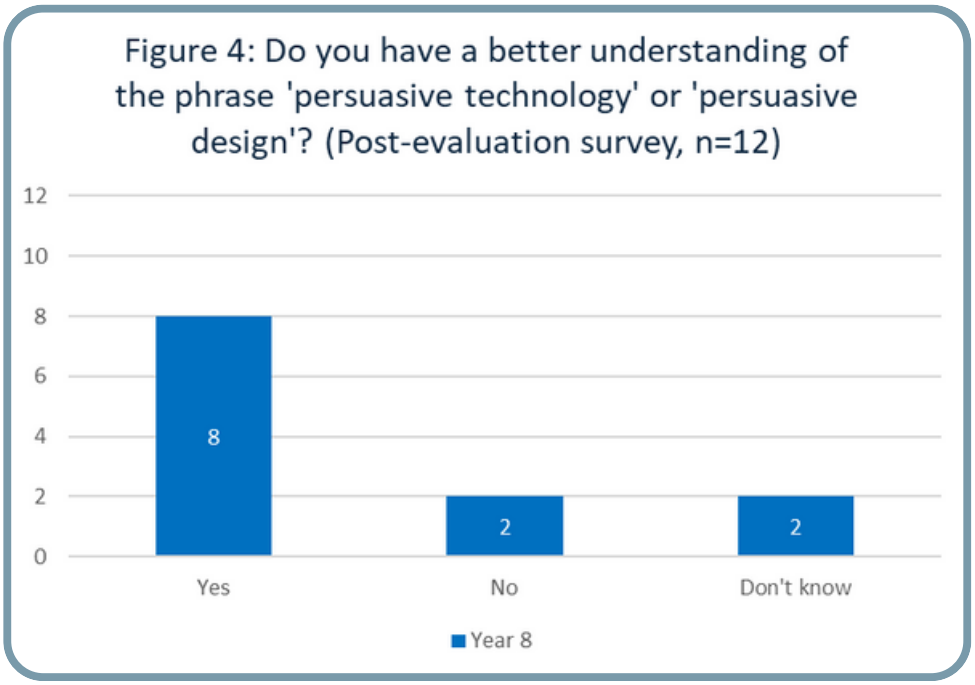
> *"Yeah. I think tonnes of people would enjoy this." (Boy, aged 12)*

5 https://www.blooket.com/

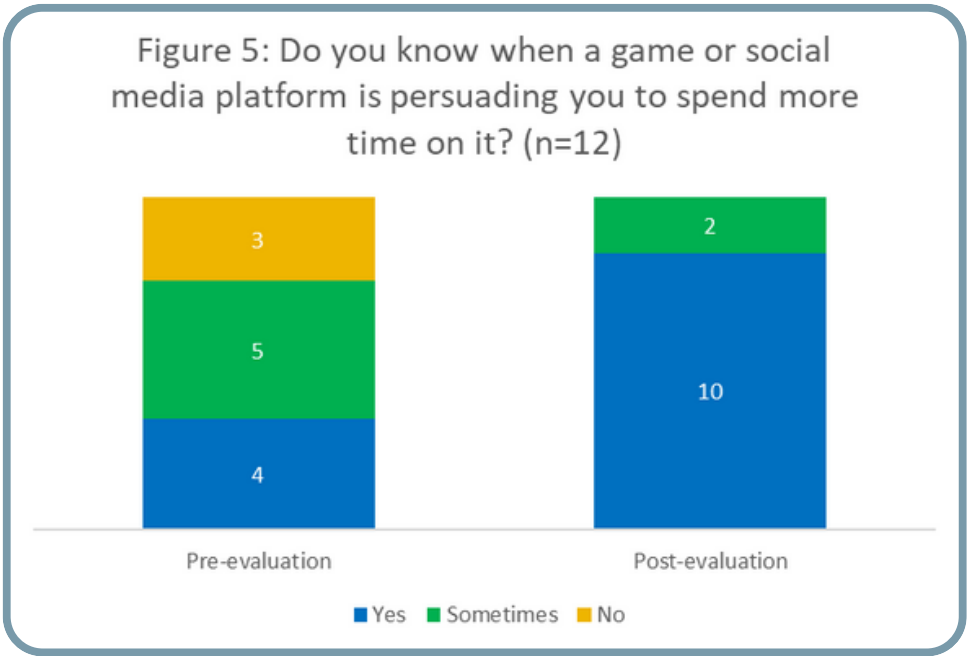
## Intervention group 2 – findings on impact from the questionnaire data

In line with the strong qualitative findings, the Year 8 group showed fairly consistent improvements in the questionnaire data as well. Although the Year 8 group were affected by some of the same shortcomings as the other groups - with limited time to work through a complex questionnaire - the participation was more consistent with the same individuals completing the pre and post questions.

### Persuasive Design Technology – questionnaire findings

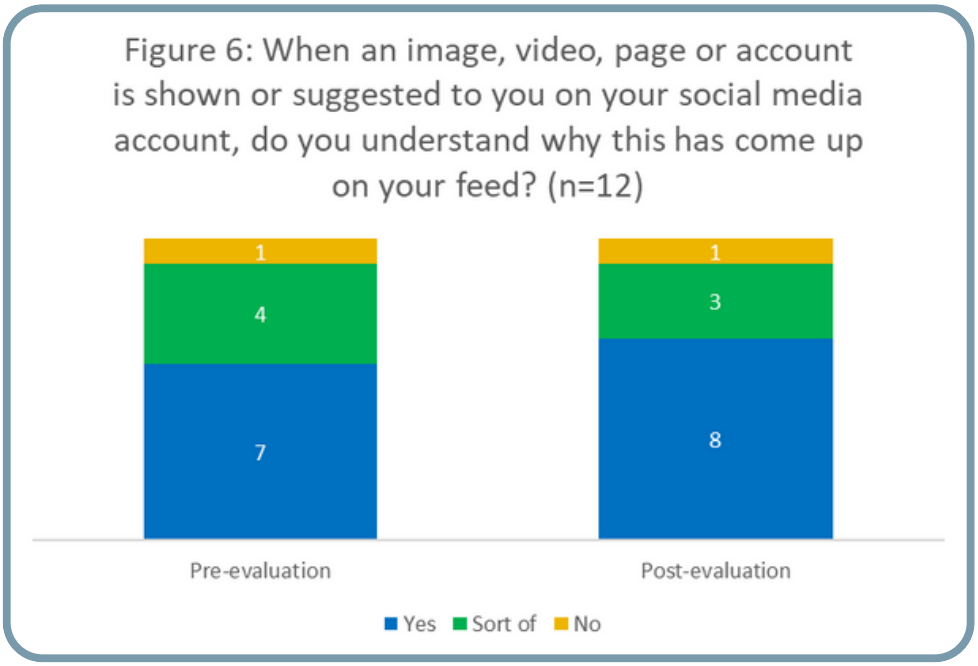



The Year 8 group tended to respond positively within the survey that they had a better understanding of persuasive technology and persuasive design. When we asked children to explain persuasive technology in the survey, their definitions indicated children developed a strong understanding of persuasive design technology and could articulate what they had learnt.




The questionnaire data also captured some improvement in Year 8 in understanding when a game or social media platform was persuading them to spend more time (Figure 5).

## Algorithms and Suggested content – questionnaire findings




Understanding of algorithms and how content is suggested for users, generally showed little difference in the scoring. Although the quantitative data suggested limited improvement the comprehension questions within the survey showed children could give clear explanations for how algorithms suggest content to their feed – and that this was a result of the learning in the sessions. The Year 8 children described

content being suggested to them, touching upon how data is collected and analysed and then coded to show more content:

> *"Because of the algorithms that get fed the data companies have on me to show me more content that I like." (Boy, aged 12)*

> *"I now know when apps are using persuasive techniques, and it makes me more aware." (Boy, aged 12)*

> *"Because I now know more about the way they use your data." (Boy, aged 12)*

## Intervention group 3 – findings on impact and process from the qualitative data

**Year 7 pupils (11-12 years old) in a mixed-gender high school setting in Newport (same school as intervention group 1).**

Despite being the smallest and final intervention group, this proved the most challenging and the least effective. This was predominantly as a result of the complex needs presented by a significant number of the pupils involved. These were unfortunately not disclosed to us until after the group was initiated which led to a gap in our planning. If these additional needs had been flagged to us in advance, we would have been in a better position to differentiate the resources and better anticipate the needs of the group. Despite the difficulties we faced in facilitating this study, it did help us focus and reflect on how we would need to tailor the toolkit for more challenging groups and to break down and simplify concepts. To some extent we were able to do this dynamically during the study. However, the experience with this group led us to reflect that for the highest level of additional needs, the children would probably have benefitted more directly from a 1-2-1 intervention.

### Additional challenges for learning

The complex needs presented by the individuals in this group was ultimately a barrier to their learning, and our delivery of our project. Unfortunately, unlike intervention group 1, we received no information on the vulnerabilities of the group from the teachers at the school, but it was clear that their levels of needs were far greater than those we had worked with in group 1. Additional needs were varied; but appeared to be linked to social and communication issues, and/or difficulties maintaining attention.

After the first few weeks of pushing through the educational sessions, we were concerned that pupils had not absorbed the learning and were also very aware of certain dynamics between individuals in the group leading to disputes and disruption. We therefore proceeded to attempt the social media campaign activity, but in a controlled way with pupils working individually, with more supervision as opposed to in pairs or larger groups and with step-by-step guidance.

These changes proved positive, with two of the previously most disengaged pupils in the group showing dedication to the task and the ability to focus on their work when working away from the distraction of others in the group. With the pupils showing more interest and commitment to the ideas we were introducing; we were able to move around them and offer individual advice and support. This benefited their work, as well as their relationship with us and their outlook on their learning.

## Education of younger online users

Unfortunately for our evaluation this group was our only Year 7 group which meant that it is difficult to assess whether the challenge with the toolkit was due to their young age or to do with additional needs (or both). Overall, we felt that given the ways the Year 8s responded, a key reason for the relatively poor response from this Year 7 group was more likely to do with their additional needs rather than a lack of readiness for the content at this age. Having said that we did reflect that perhaps depending on learning needs some of the content could have been simplified further to make it more accessible.

Interestingly, we found that the Year 7 group did want to talk to us about their digital lives and experiences and enjoyed this part of the approach. They also told us that they enjoyed learning in a small group and discussing their ideas.

> *"[Working] as a group, because you can then talk more and communicate with other people and share ideas." (Girl, aged 11)*

> *"My thoughts on the project are that it's very fun and we actually got to communicate with each other, and we actually got to talk about how things actually work. Because there are some people our age who have got into trouble for things that have happened online, so knowing this might actually be helpful to them." (Boy, aged 12)*

However, we found that this group often pushed back when asked to think or relate their digital experiences to the themes of our toolkit. We struggled to have breakthrough moments like we often did with the earlier groups - with them able to connect their own use to the overarching design and drivers of apps and online services. This was potentially an indication that some of them were not quite ready to consider the concepts involved or that some of these concepts were too abstract or difficult for them to grasp. It might also be that they were resistant to the implied criticism of their favourite app and games.

Ultimately, the experience highlighted that our toolkit is more suitable for older groups of children. However, our experience with Year 7 was useful in that it gave us an idea of what differentiation would be needed to make to the toolkit suitable for younger children. We would need to adapt activities quite substantially and simplify the educational information provided. Although positive and insightful, our experience in adjusting the social media campaign task (detailed in the above section) provided just a snapshot of the differentiation that would need to be made. The whole toolkit – including educational content, worksheets, set-up of group activities and how conversations are framed, would need to be simplified. Some children in this group suggested they would benefit from more visual educational content, such as posters or videos that could help them more easily engage with the toolkit.

> *"I think we could have posters and visuals to help us learn about things like taking a break and stuff like that." (Boy, aged 12)*

> *"Put up posters – do a video that everyone wants to watch, like a 'Get Ready with Me' (GRWM) where they talk about staying safe and your mental health online, so people watch and then enjoy it, and you talk to them about the online world." (Girl, aged 12)*

Our findings suggest that in groups where the vast majority of children have an additional communication need or learning difficulty, 1-2-1 support or small group work, (and consequently staffing levels) should be considered, as well as a careful consideration to relationships and dynamics within a group of pupils.

Despite our experience that the pupils in intervention group 3 did not access the project as successfully as the other groups, we found that quite a few of the pupils told us that they had benefitted and felt children their age and younger would benefit most from it. This could be an indication that they believed younger children need education on this topic because they have the least experience.

> *"Well, my thoughts are that we actually learned a lot. I'm happy that we learn more about our phones." (Girl, aged 12)*

> *" I think Year 5/6 because I was naughty on my phone in Year 6." (Girl, aged 12)*

> *"Year 6 because they're younger and they're more naughty I guess, more vulnerable." (Girl, aged 11)*

Some also argued that the lessons should be for all:

> *"You want to know what the internet is doing to you I guess…. we shouldn't have people to have to come in and select a certain group of people (like us), it should be for everyone." (Girl, aged 12)*

## Intervention group 3 – findings on impact from the questionnaire data

The quantitative data for Year 7 did not show any meaningful change in either direction, and some of the survey questionnaires were left incomplete making it difficult to compare pre and post intervention. Among the Year 7 children, there appears to be a need for more child-friendly language within the survey and in the use of terminology which many struggled with even after explanation. Despite this whilst some Year 7 children offered irrelevant answers when asked to explain algorithms, most year 7 children were able to explain in the post evaluation survey how content came to their feed and demonstrated a good understanding of how this worked when asked to explain it. However, they struggled to include key words such as "algorithm" or offer a more detailed description of the process.

> *"Because if I watched the same type of content, it will think I like it and play it again." (Boy, aged 12)*

# Learning and next steps

## Areas of success and challenges

### Impact

Although we experienced challenges with our use of questionnaires, the data we collected for Years 8 and 9, combined with qualitative and observational evidence gathered for all year groups, provides a broadly positive picture in response to our first 'impact' key evaluation question:

> Were participants better able to identify persuasive design technologies and the ways in which this shaped their online experiences?

Impact findings around understanding and identification:

- The majority of Year 8 pupils felt they had a better understanding of 'persuasive technology' or 'persuasive design' as a result of the project. This was reflected in the qualitative data and to a more limited extent in the qualitative data.

- The Year 8 group had the ability to demonstrate their understanding by providing the correct definitions. We found that the pupils in this group were able to successfully understand how the 'attention economy' worked to generate revenue for social media and gaming platforms. The pupils were also able to identify specific persuasive design techniques and how these are used by apps to keep you returning to them. These ranged from techniques that prompt you to check the app, like a notification of a 'follow' or 'like', to on-app design choices like infinite scroll.

> *"It uses an algorithm to recommend me things that I have searched or liked." (Boy, aged 12)*

> *"They try to like to invite you back by notifications if friends are online... Notifications, infinite scroll, auto-play, in-game payments etc" (Boy, 12 years old)*

- Qualitative data from the Year 9 strongly suggested they had an improved understanding of persuasive technologies (although their answers in the questionnaires were not as conclusive). In the creative exercises the Year 9 groups developed a range of campaign ideas exploring the ways content feed works to show users content that aligns with their viewpoint and interests. They also explored the impact of automatic scroll on apps such as TikTok, and how the lack of active choices or agency could mean that users lost track of time. Several participants shared how they found this to happen to them.

- Finally, some of these benefits were shared by the Year 7 group in that some were able to reference the role of algorithms in deciding which content they were shown. These successes were despite the limitations involved in working with the Year 7 group that have been outlined above.

> *"My thoughts on it now. Ah, now I have a better understanding of what social media can put you through. I think the project was really cool." (Girl, aged 12).*

Our second 'impact' Key Evaluation Question asks:

If they are better able to understand and identify persuasive design strategies and how their content, and interactions are formed through these, does this actually change their online habits – or make them more likely to resist these technologies?

It is not possible to judge the actual impact on participant behaviour as this was not measured directly as part of the evaluation due to time and other practical constraints (see Evaluation section below). However, some participants did offer suggestions about how they intended to change their behaviour since being part of the project and learning about the impact of persuasive technology. A small selection of these is included below:

> *"My [screen time] has actually gone down. I understand it now and I know that they are just going to sell my data."(Boy, aged 12)*

> *"I could maybe back away from certain apps and take a break from apps, I could use it all less and do more activities without going on Snapchat." (Girl, aged 14)*

> *"I could do more [sports] training to keep me away from irrelevant stuff on my phone." (Girl, aged 14)*

*"I put my phone on do not disturb a bit more." (Boy, aged 14)*

*"I will make more plans in real life and not online." (Boy, aged 12)*

*"I will find a way to take time off social media." (Girl, aged 11)*

## Delivery Method

Our first 'process' key evaluation questions asks:

> How well did the toolkit, the ways the session was run, and the exercises and tasks keep children interested, engaged, and motivated?

As we have described throughout, we found that our toolkit and approach was very successful for the Year 8 and Year 9 group, and we had overwhelmingly positive feedback on their interest, engagement, and motivation. They greatly appreciated the games and discussion-based exercises and tasks as well as the creative activities. We also had positive feedback from the Years 7s but we found (as described above) that it was more common for this group to struggle to concentrate or become distracted in some of the sessions.

Our second 'process' key evaluation question asks:

> What did we learn for the future about effective ways to approach and educate children about these issues in a way that is engaging, and which connects with their experiences?

The project taught us a great deal about how to educate young people on these topics in a way that is interesting and meaningful to them. We found that children and young people greatly appreciated the freedom to think and talk through digital issues collectively and share their issues and challenges with each other.

We observed that the different elements of our delivery method complimented and strengthened each other. For example, allowing pupils to engage with a kinaesthetic activity at the start of a class created enthusiasm and energy which supported goodwill and a willingness to engage. In most cases this allowed pupils to start thinking about the topic, without too much pressure, giving them space to work through their thoughts before having to voice them or write them down. This then led well into open, honest, and in-depth group discussions where the young people shared ideas and concerns. Having successfully

communicated and bonded through these exercises, pupils then worked well together in the creative activities, like the social media campaign that showcased their learning. A key lesson for us is that an important way into this topic is to have the confidence to encourage children to consider, lead and share some of their own experiences and challenges with 'persuasive' online environments so that the conversations are interesting, useful and connect directly to their experiences.

## Ideal target audience and approach for the current project

The intervention groups allowed us to see how our toolkit and project worked with different sized groups of children, of different genders and levels of need. Based on our experiences with all groups, we would set out the following for the use our of toolkit as it currently stands:

- Ideal group size for the intervention is between 10-12 pupils
- If there are members of the group with particular behavioural issues or additional needs, consider more staff to provide 1-2-1 or small group support
- Suitable for pupils in Year 8 and 9
- Toolkit to be delivered across 6 1-hour sessions, with some scope to add an elongated session for the creation of the social media campaign
- Good attendance is key to this project with concepts that are likely new to the children being explored
- Access to computer technology for the creation of the social media campaign is ideal, but not essential – individuals could create something alternative
- The group needs a confident and relaxed style of facilitation that is open to children shaping the discussion and flow of conversation

Our third 'process' evaluation question asks:



What other lessons can we take forward to improve our work with young people in future?

## Modify the toolkit for a younger group

Although we are confident about the success of our methodology with the majority of pupils, our experiences across all three intervention groups have raised awareness of how our work could be developed further for some children and young people. As discussed above the concepts used and educational content of the toolkit would need further development, simplification, and differentiation for younger pupils (Year 7 or below). The older pupils we saw, Year 8 and Year 9, were able to access the content well, especially once we had adjusted some of the more abstract content e.g. the session on the attention economy.

In addition, differentiation for the toolkit should be considered for children with behavioural difficulties and additional learning needs (ALN) or special educational needs (SEN). We consider that at least some of the difficulties we faced with the year 7 group related to the high level of additional needs of children in the group. Although certain activities and tasks could work well with these pupils, the project as a whole would benefit from more individualised and simplified tasks in smaller groups with greater use of visual and creative materials. This is an important consideration, with ALN/SEN pupils being amongst the most vulnerable, especially on the online world.

We believe that the current toolkit could be used as a strong baseline for further iterations both for younger children as well as for those with additional learning needs. These could include various elements of the following:

- Simplified educational content
- Greater visual and video content and reduced requirement for writing
- Online gaming elements – e.g. Blooket games
- Greater game elements where children can work individually or in pairs
- A continued emphasis on kinaesthetic activities
- Paired working – an opportunity for co-creation in a more controlled manner

## Evaluation

As discussed above, due to the small group nature and the shortcomings with the questionnaire process it has been difficult to evidence the success of the project other than through qualitative data. In further iterations of this project, it would be helpful to design a much simpler set of questions with indicators and perhaps delivering this in a way that is not as text heavy – e.g. through an online game or through a practical visual task (e.g. using paper and emojis for different responses). In this way it would be possible to integrate the evaluation assessment into the core activities of the session more effectively. It has also not been possible to assess if the project has had a lasting impact on the children involved due to the lack of longitudinal design. A possible future project could seek to include a follow up assessment at a later date.

# Ideas for action

## Publish our toolkit

We intend to publish the final educational toolkit on our website so that it is available for educators to access and test freely. We feel strongly that the content on 'persuasive technology' is crucial for young people to understand as it goes to the heart of how and why children experience social media and gaming in the ways they do. We believe it is important that they are given the space to share and consider their thoughts and experiences of the online world, specifically the impact of persuasive technology on their lives and wellbeing.

The toolkit includes for every session:

- A slide deck to share with participants and guide them through the session
- A facilitator guide which provides educators with all the information they need to teach the session, including key questions to ask, corresponding slides and activities, material lists and timing guides
- A resource pack of all worksheet resources needed, ready to print

## Seek future funding

To further develop the toolkit sessions as a fun, engaging set of lessons that increases children and young people's understanding of the design and architecture of the media they use – we will seek out opportunities to further test and develop the toolkit where possible. We are particularly interested in developing and testing the toolkit for use in youth and community settings, as initially intended by this project.

Making sense of media

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