

# Raising Young Pupils and Students' Awareness Levels About the Impacts of Digital Technologies on the Environment, Climate, Health and Well-Being Through a Challenge

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# Context and Motivations

- Awareness of impacts of the **usage of digital technologies**

*On the environment, the climate, the health, the well-being...*

- Both **positive and negative impacts** not well-known
  - Only a small part is visible (dark-side of the internet)
  - Moving towards better design not enough (green IT)
- **Raise awareness** of young people about these impacts

*Targeting schools pupils and higher education students*

# DigiScope Project

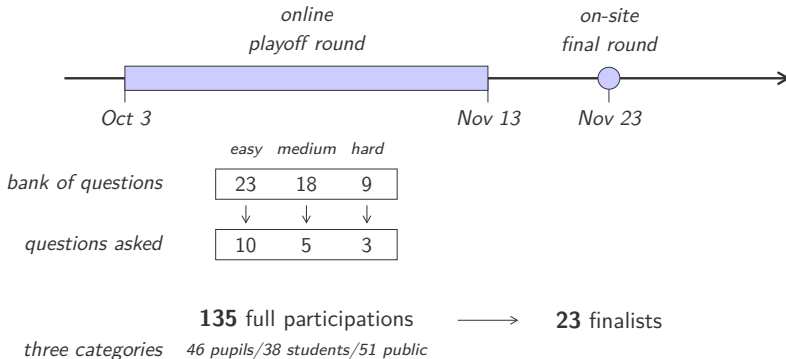
- Funded as part of the European **Mindchangers** project  
*Regions and youth for Planet and People*
- Making them **aware on the impacts** of digital technologies  
*Mainly on the environment and the climate*
- Activities and communication tools created **by young people**  
*A quiz walk in the city, a challenge and a card game*



# DigiScope Challenge 2022

- DigiScope Challenge 2022 organised as a **two-round event**

*In the end of the year 2022, in the French community of Belgium*



# Question Design

- Questions have been created by a jury of young people

*Eight students, seven young professionals and three CS professors*

- Playoff round focused on figures and final on concepts

- What share do digital technologies play in global greenhouse gas emissions?

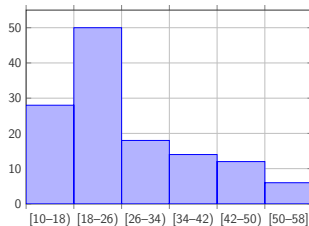
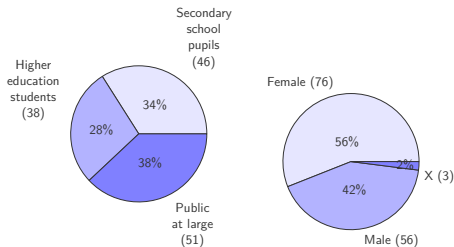
*A) 0.20%      B) 1%      C) 4%      D) 10%*

- In which phase of the life cycle of an electronic device do we produce the most waste?

*A) manufacturing      B) use      C) recycling  
D) the three phases produce a similar amount of waste*

# Participants' Profiles (1)

- Quite **uniform distribution by categories** in the playoff round  
*And more woman than man, except for higher education students*
- **Age groups** targeted by the project have been reached  
*And good distribution among French-speaking parts of Belgium*



# Participants' Profiles (2)

- **Short survey** conducted at the beginning of the challenge
  - People are not paying attention to their digital consumption
  - People are not informing/training themselves on the subject

|  | Yes | No  | Partly |
|--|-----|-----|--------|
| Q1: Do you usually pay attention to your digital consumption?                            | 44  | 78  | n/a    |
| Q2: Have you ever attended workshops, conferences, training or events on sustainable IT? | 19  | 100 | n/a    |
| Q3: Would you be ready to adapt your digital behaviour to reduce the negative impacts?   | 70  | 5   | 46     |

|          | Q1         |            | Q2        |            | Q3         |           |            |
|----------|------------|------------|-----------|------------|------------|-----------|------------|
|          | Yes        | No         | Yes       | No         | Yes        | No        | Partly     |
| Pupils   | 32%        | 68%        | 23%       | 77%        | 50%        | 5%        | <b>45%</b> |
| Students | <b>43%</b> | <b>57%</b> | 24%       | 76%        | <b>66%</b> | <b>0%</b> | 34%        |
| Public   | 35%        | 65%        | <b>4%</b> | <b>96%</b> | 59%        | <b>7%</b> | 35%        |
| Total    | 36%        | 64%        | 16%       | 84%        | 58%        | 4%        | 38%        |

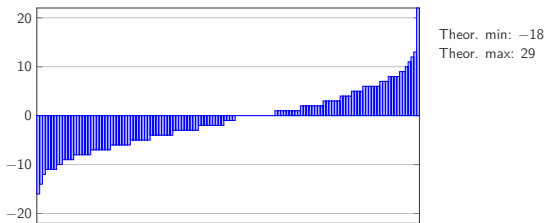


# Participants' Scores (1)

- Positive score for 51 participants out of 135 for playoff round

*And 70 with a negative score and 14 with a score of 0*

- Only a third of the questions answered correctly on average



|                 | Min | Max | Mean | Stddev |
|-----------------|-----|-----|------|--------|
| Total score     | -16 | 22  | -1.1 | 6.1    |
| Correct answers | 0   | 14  | 6.3  | 2.4    |
| Wrong answers   | 0   | 17  | 10.4 | 3.5    |
| Abstentions     | 0   | 18  | 1.4  | 3.2    |

## Participants' Scores (2)

- **Students** better performed than other categories

*Slightly higher average score and better max score*

- More strictly positive scores for **public** contestants

|          | Total score |     |      |        | # contestants |     |     |
|----------|-------------|-----|------|--------|---------------|-----|-----|
|          | Min         | Max | Mean | Stddev | < 0           | = 0 | > 0 |
| Pupils   | -16         | 13  | -2.0 | 6.3    | 28            | 4   | 14  |
| Students | -14         | 22  | -0.5 | 6.0    | 16            | 9   | 13  |
| Public   | -12         | 12  | -0.7 | 5.9    | 26            | 1   | 24  |
| Total    | -16         | 22  | -1.1 | 6.1    | 70            | 14  | 51  |

# Participants' Awareness

- The six best answered questions reveal **people awareness**

*Five easy and one medium, similar results if split by categories*

|  | Answer option A |      | Answer option B     |      | Answer option C                          |      | Answer option D         |      |
|--|-----------------|------|---------------------|------|--|------|-------------------------|------|
| Q4: What proportion of e-mail sent worldwide each day is read?                                 | <b>40%</b>      | (35) | 55%                 | (19) | 60%                                      | (9)  | 75%                     | (1)  |
| Q12: What is the proportion of young Belgians who have already been victims of cyber-bullying? | one out of 2    | (8)  | <b>one out of 3</b> | (42) | one out of 5                             | (17) | one out of 12           | (2)  |
| Q15: What proportion of connected objects is recycled around the world?                        | 0.5%            | (5)  | 1%                  | (16) | <b>5%</b>                                | (29) | 10%                     | (3)  |
| Q22: What share does digital technologies play in global greenhouse gas emissions?             | 0.20%           | (3)  | 1%                  | (5)  | <b>4%</b>                                | (32) | 10%                     | (13) |
| Q23: What benefits can be attributed to the (reasonable) practice of video games?              | creativity      | (2)  | visual acuity       | (5)  | ability to concentrate and pay attention | (13) | <b>all of the above</b> | (32) |
| Q40: What percentage of the weight of office waste in France is consumable paper?              | 45%             | (5)  | 60%                 | (3)  | <b>75%</b>                               | (18) | 80%                     | (3)  |

# Conclusion and Future Work

- A **challenge** is a motivating fun way to train/inform people  
*DigiScope challenge about impact of use of digital technologies*
- First analyses shows that **broad view on impacts** still lacks  
*But on another side, people are willing to know more*
- Future work includes going **deeper into the analyses**
  - Analysing the results from the final round
  - Analysing how the challenge can be used in schools