

Arithmós Project: Transforming children's maths education through digital games

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Background

- Children with maths anxiety experience feelings of apprehension, tension, and discomfort when faced with maths situations;¹
- Maths anxiety is associated with pervasive effects on maths learning: a sense of helplessness, reduced maths self-efficacy, avoidance, and poorer maths achievement;¹

Arithmós Project main goal: Engage children, families, teachers, and policymakers to improve maths learning

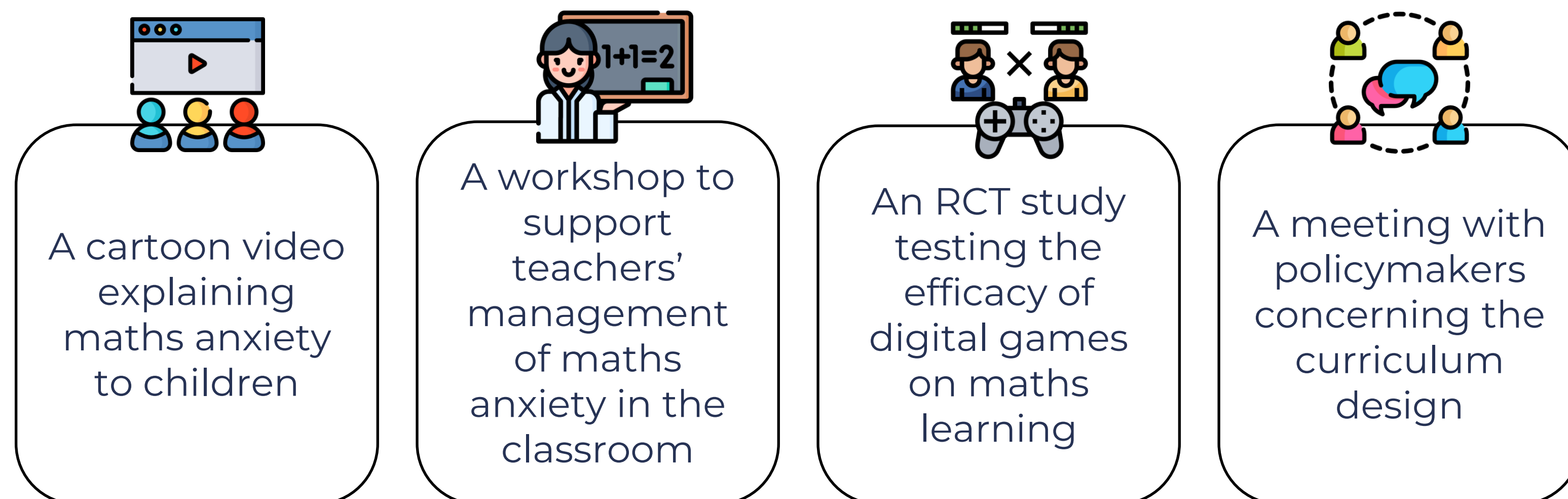


Figure 1. Diagrammatic representation illustrating the branches of the Arithmós Project.

The Arithmós Project aligns with and adheres to substantiable developing goals, including good health and well-being (SDG3), quality education (SDG4), gender equality (SDG5), and reduced inequalities (SDG10).

Main deliverables

Teachers' maths anxiety classroom management

The workshop was successfully conducted at the schools participating in the project and also presented to researchers and teachers, for instance at the Irish Mathematics Teachers Association, Institute of Physics, Cambridge University, Education University of Hong Kong, and Transform-Ed, organized by the European Commission.

Cartoon video

- A cartoon video for families and children aiming to raise awareness about Maths Anxiety.

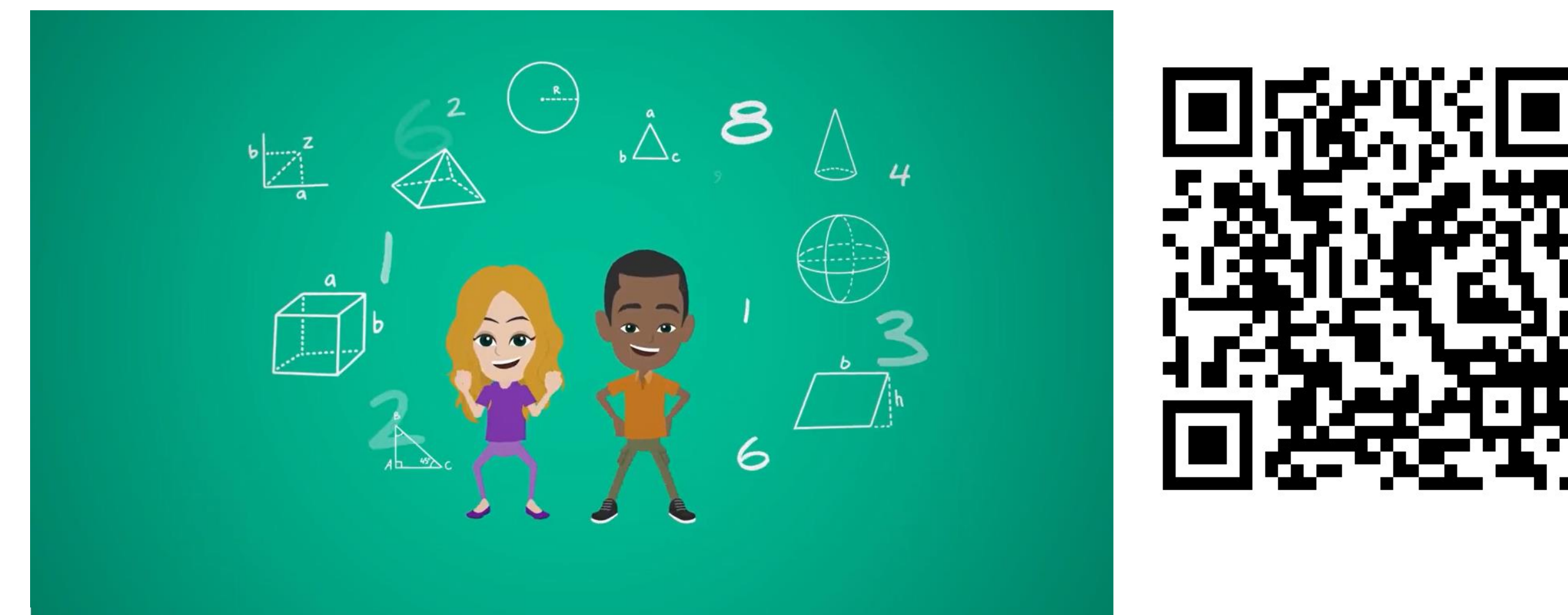


Figure 2. Screenshot of the cartoon video. The video can be accessed through the QR code.

Development of digital game with maths-anxiety aware features

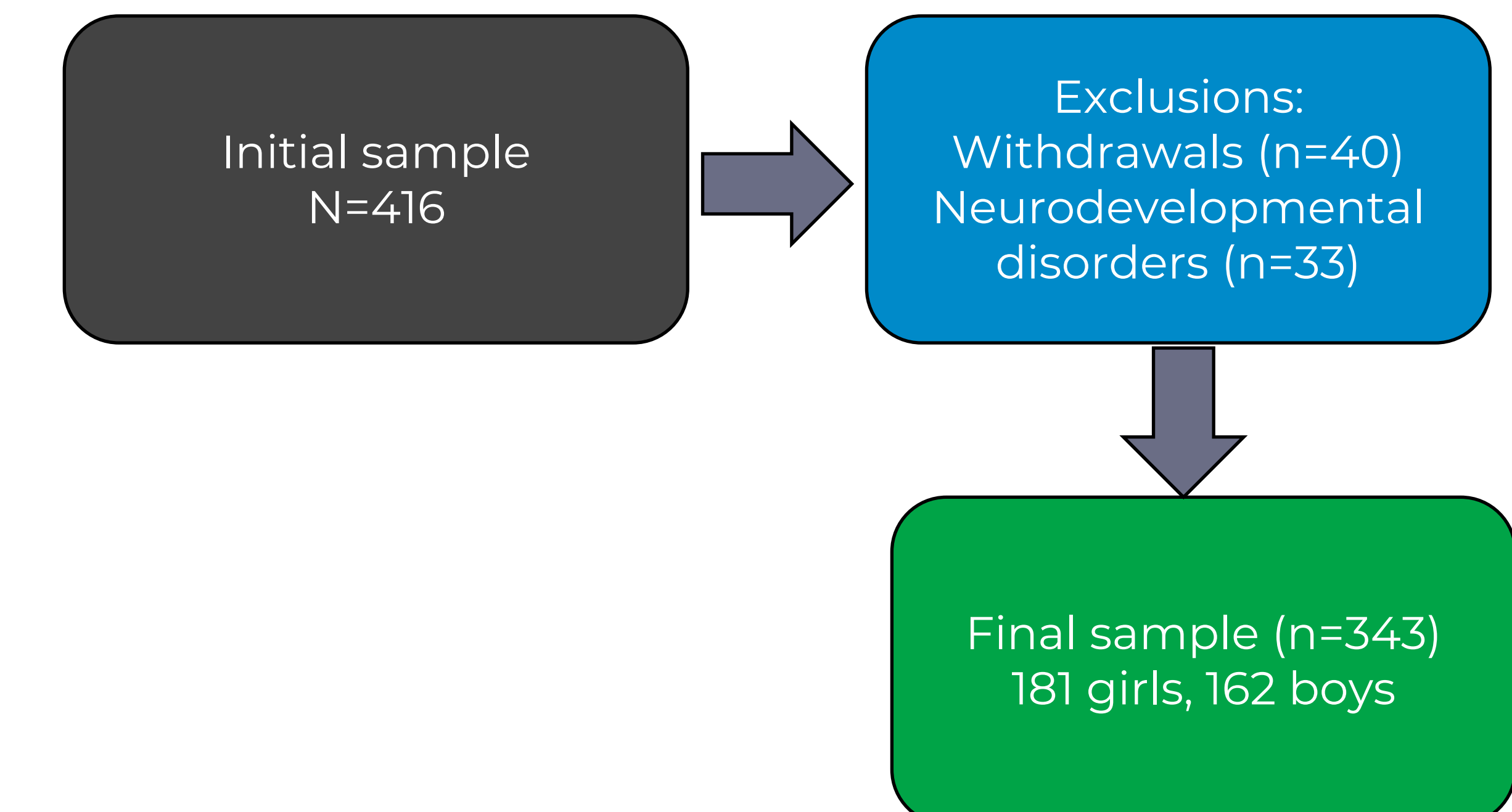
- Seven Spells is a digital card game which the main goal is to capture the opponents' cards. Children need to combine their Number cards with the opponents to capture the cards and score points. They can use the Spell cards to boot their movements. The first version of Seven Spells has been previously awarded in two educational game competitions. In the Arithmós Project, the game was augmented with features specifically tackling maths anxiety.



Figure 2. The Seven Spells game played in single-player mode (left) and versus an opponent (right).

RCT study

- A 2 (experimental vs control) x 3 (pre-test vs post-test vs follow-up) RCT study is currently ongoing. Presently, we have successfully recruited 416 3rd and 4th graders from 5 schools (16 classrooms) located in Dublin. The study is scheduled for completion in December 2023, with an additional 4 classrooms (n=85) being added to the sample.



Meeting with policymakers

- We have published a policy paper with the aim of raising awareness about maths anxiety.
- Additionally, we are organising a meeting intended to present the Report containing the project's main findings to policymakers, scheduled to take place in January/February 2024.



QR code for the policy paper.

Conclusion

- The Arithmós Project has implemented a multi-layered and innovative initiative that has significantly benefited social, scientific, and academic spheres.

References

¹ Ashcraft, M. H. (2002). Math anxiety: Personal, educational, and cognitive consequences. *Current directions in psychological science*, 11(5), 181-185.