

Executive Function

Cognitive Science
Research and Innovation
Work Group supported by a
Researcher in Residence:
Camilla Gilmore

Maths Hubs Network
Collaborative Projects
2021/22



Fully funded by the Maths Hubs Programme so is free to participating schools.

Outline

Some people describe executive function (EF) as “the management system of the brain.” That’s because the skills involved let us set goals, plan, and get things done. EF includes three categories: inhibitory control, working memory and attention shifting/cognitive flexibility. EF predicts maths achievement as well as success in school broadly (Clements, Sarama, and Germeroth 2016). Most teachers rate EF components as important for maths thinking and learning, and these ratings increase with teaching experience (Gilmore 2014).

<https://www.understood.org/articles/en/what-is-executive-function>

https://www.researchgate.net/publication/332182701_Double_Impact_Mathematics_and_Executive_Function

Details

What is involved?

This is an action-research Work Group focussed on the following questions:

- How can maths tasks be varied by attending to executive function?
- Does supporting the development of executive function improve understanding in mathematics?

Participants will work together to consider how to modify tasks, to increase/decrease executive demand. They will put this into action in their own classrooms, then share and reflect on observations of the impact on both the mathematics explored and the resulting mathematical understanding of their learners. We are running this programme online to allow access across the hub region.

What are the benefits?

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Participants:

- ✓ Understand executive function
- ✓ Understand how to modify maths tasks in order to increase or decrease executive demand

Learners:

- ✓ Improve their ability to exercise inhibitory control, utilise working memory effectively and work flexibly, shifting attention as needed, leading to improved mathematical understanding

Contributing to the body of research

- ✓ The findings of the Work Group will be shared so that they can inform practice across and beyond the hub, hopefully leading to further research.

The wider context

Research indicates that working on executive function within mathematics benefits both EF skills and mathematical understanding. One of the ways to do this is to insert executive challenge into everyday mathematics.

Teachers have also been considering what it means to work at a deeper level in mathematics and attending to executive function may provide a framework for achieving understanding at a greater depth.

Expectations of participants and their schools

Schools must be able to commit to the full programme. This involves a launch (which we hope participants will attend live in December, along with their senior leaders, but which will be recorded for those unable to attend), six online one and a half hour twilight Work Group meetings, classroom and school-based activity exploring ideas from the Work Group in maths lessons and a final meeting for participants to share their findings. Where possible, participants should be supported by their school leadership to explore outcomes from the project with other colleagues in their school.

Workshop details

Meetings will be online and led by Ruth Trundle and Camilla Gilmore

Launch: Wednesday 15th December 2021 16:00 – 17:00

Meeting 1 Wednesday 5th January 2022 15.45 – 17.15

Meeting 2 Thursday 20th January 2022 15.45 – 17.15

Meeting 3 Wednesday 9th February 2022 15.45 – 17.15

Meeting 4 Wednesday 9th March 2022 15.45 – 17.15

Meeting 5 Wednesday 30th March 2022 15.45 – 17.15

Meeting 6 Thursday 5th May 2022 15.45 – 17.15

Feedback Wednesday 8th June 2022 15.45 – 17.15

Link to expression of interest form [here](#).