



CASE STUDY REPORT

To develop higher order thinking skills in Year 5 mathematics lessons

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This study was originally published in 2009 as part of the 'What Works Well' initiative, part of the National Strategies for Education in England.

Abstract

Background: The purpose of the study was to develop independent learning and higher order thinking in Year 5 Maths Lessons by trialling the TASC Model to increase opportunities for learner independence.

Aims: The main aim was to develop independent learning and higher order thinking in Year 5 Maths Lessons by using the TASC Model to encourage pupils to work in groups, discuss and make decisions in a social context.

Methods: The participants in this case study are a headteacher, middle leader, senior leadership team, subject leader, support staff, teacher, and pupils. They are all involved in developing problem solving, reasoning, and numeracy skills, and encouraging independent learning and higher order thinking. Methods used to impact pupil learning included providing regular opportunities to use thinking and problem-solving skills, encouraging pupils to work in groups, giving them freedom to choose their own theme to investigate, and coaching teachers to use the TASC Wheel.

Findings: The main findings of this case study are that the TASC Model was successful in developing independent learning and higher order thinking skills in Year 5 Maths Lessons. Pupils enjoyed taking on leadership roles, being given more choice in their learning, and using ICT effectively. Teacher acted as a facilitator and pupils developed life-skills such as working as part of a team, discussing ideas, making decisions and compromising.

Implications: The findings suggest that providing pupils with opportunities to work collaboratively, develop thinking skills, and solve their own problems can have a positive impact on their learning. It also highlights the importance of teachers acting as facilitators and providing pupils with more choice in their learning.

This abstract was generated by Camtree using a large language model (LLM) and added to the original report in 2023.

Keywords: Primary education; Problem solving, reasoning and numeracy

Introduction

What were your reasons for doing this type of development work?

Key areas to develop identified from Gifted & Talented Classroom Quality Standards (CQS) Audit include providing regular opportunities to use thinking and problem-solving skills and to increase opportunities for learner independence.

In Year 5 Maths Lessons, through observations, I noticed that many pupils were not equipped with the skills or hadn't been given enough opportunities to think at a higher level or work collaboratively.

From my reading, I was interested to learn that 'Schools...need to ensure that young people develop skills and attitudes that employers value...' Gilbert (2006), such as how to work in a team, communicate effectively, persevere through a problem and find solutions.

As part of the Pilot for Gifted & Talented Education, I trialled Belle Wallace's Thinking Actively in a Social Context (TASC) Model to develop independent learning and higher order thinking.

Who might find this case study useful?

- Headteacher
- Middle leader
- Pupil
- Senior leadership team (SLT)
- Subject leader
- Support staff
- Teacher

Description

What specific curriculum area, subject or aspect did you intend to have impact on?

- Problem solving, reasoning and numeracy

How did you intend to impact on pupil learning?

Develop thinking skills and independence in maths by encouraging pupils to work in groups; discussing and making decisions in a social context. Pupils to become actively involved in their own learning on a theme of their choice and have positive attitudes to maths.

What were your success criteria?

- Pupils discussing ideas and working together
- Teacher acting as a facilitator
- Pupils given freedom to choose own theme to investigate, ways of working and presenting
- Pupils self-reflecting about how groups had worked together and progress made with the task
- Pupils able to overcome problems by thinking more broadly

What information or data did you use to measure progress towards your success criteria?

- Logs or interviews
- Observation outcomes
- Pupil consultation data
- Pupils' work

Describe the CPD approaches you used

The Local Authority Consultant for Gifted & Talented Education arranged a meeting with a secondary colleague who had tried out the TASC Model recently, another secondary G&T Leader, the LA consultant and myself. We discussed our ideas and reservations about using the TASC Wheel. An INSET for TASC Wheel and Coaching was held for teachers from 3 schools to be informed and to feel confident to try out a new style of teaching. Following this training session, I observed the secondary colleague (experienced in using the TASC Wheel) deliver a TASC style English lesson, which gave me the confidence to try it out in my own classroom.

A secondary colleague, the Lead Teacher for Gifted & Talented in her school, and I both decided to trial the TASC Model. We coached each other in the planning of 2 sessions and observed each other teach 1 lesson, giving constructive feedback. This was extremely supportive to both of us and helped us move our understanding of the TASC Wheel forward. Coaching is a great way of supporting professional development as it helps the coachee clarify their thinking and feel more confident to try out something new.

What CPD materials, research or expertise have you drawn on?

Primary Leadership Paper No.24 september 2008 NAHT Publication

Who provided you with support?

- External agency

How were you supported?

- Oxford Brookes University – G&T Education
- National Strategies
- QCA.

I took part in a pilot for Gifted & Talented Education involving 12 Local Authorities across the country with 2 G&T Lead Teachers from each Local Authority. Oxford Brookes University, National Strategies and QCA lead the 3 training sessions over the past year and were interested in our group discussions, particularly thinking about the curriculum for the 21st Century. I carried out action research trialling the TASC Wheel and produced a portfolio detailing my findings, accredited by Oxford Brookes University.

Impact

What has been the overall impact on pupil learning?

- Pupils enjoyed taking on leadership roles
- Pupils enjoyed being given more choice in their learning
- Pupils used ICT effectively to find data on their topic and in their final presentation
- Pupils were discussing learning, solving problems for themselves and working in groups.

Thoughts you think are relevant to overall impact on learning

Boys dominated the groups in terms of the themes being selected and some groups found difficulty working together without arguing.

Quotes you think are relevant to overall impact on learning

Pupil quotes:

It's fun, I liked using the computers and art.

It's good to be able to choose the topic and present it how we wanted.

I liked the leadership roles, being chairperson, scribe and spokesperson.

Quantitative evidence of impact on pupil learning

- Periodic teacher assessment

Qualitative evidence of impact on pupil learning

- Logs or interviews
- Observation outcomes
- Pupil consultation data
- Pupils' work

Describe the evidence of impact on pupil learning

There is no quantitative evidence only qualitative evidence which supports the overall impact judgement on pupils learning:

- pupils enjoyed learning using the TASC Wheel approach
- work produced met the success criteria
- pupils developed life-skills e.g. working as part of a team/group, discussing ideas, making decisions and compromising, evaluating their work, solving problems.

What has been the impact on teaching?

It was interesting to act as a facilitator and stand back and observe what was happening in the classroom. I found it difficult to do but realised how much pupils can or cannot do without the teacher guiding them. It is important to have a balance: ensure that opportunities for collaborative work are planned so that pupils can develop these important life-skills.

Quotes you think are relevant to the impact on teaching

I feel that we need to give children more opportunities to work collaboratively, develop thinking skills and solve own problems and the TASC Wheel did help develop these skills.

Teacher

We enjoyed learning in this way, it was fun.

Pupil

I thought it was fun because we used the computers a lot and used art.

Pupil

I liked being the chair person and scribe.

Pupil

Evidence of impact on teaching

- Evidence from planning
- Teacher perceptions

Describe the evidence of impact on teaching

Teacher perception was correct that pupils ask for help too quickly without trying to solve their own problems, so more opportunities must be planned for open-ended project work.

Planning showed that teacher acted as a facilitator rather than telling the pupils what to do and encouraged them to think about the learning process themselves. Pupils did learn how to learn throughout the project, but found it challenging as they do not yet have the necessary skills.

What has been the impact on school organisation and leadership?

- SMT meeting to discuss impact of project and how we can implement this approach across the school.
- G&T and Maths Leaders to lead INSET in Spring Term re: Independent learning in maths, then monitor planning and carry out lesson observations.

Evidence of impact on school organisation and leadership

Inclusion of actions in school improvement plan.

Summary

What is the crucial thing that made the difference?

Teacher acting as a facilitator and not solving the problems for the pupils, by questioning them to try alternative approaches.

What CPD session and resources were particularly useful?

- Learning from the experiences of others who have tried the TASC Model - other secondary colleagues
- Observing a colleague teach a TASC lesson
- Coaching another G&T Lead Teacher trying out a new teaching style (TASC Model) - planning & teaching
- We supported each other, it helped us to clarify our thinking (See Lauren Carnegie's Related Case Study at the end of the Summary Page).

If another individual or school was attempting to replicate this work, where would they start and what would the essential elements be?

- Read Belle Wallace's TASC.
- Whole school approach is the best way as everyone could have a go and discuss pitfalls, rather than one teacher trying something out on their own and no-one to share it with.
- Coaching is also very supportive.
- Develop with pupils working in twos or threes first and build up to fours, or just try out with your G&T pupils.
- Essential elements – pupils collaborating, thinking for themselves (not teacher telling), deciding on ways of working and how to present, use of ICT.

What further developments are you planning to do (or would you like to see others do)?

Establish a network of schools to develop and promote strategies to raise the attainment and skills of G&T pupils.

Supplementary Materials

This report is accompanied in the library by the following supplementary material:

- TASC Lesson Plan
- TASC Group Work
- TASC Work
- G&T Portfolio Action Plan

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About 'What Works Well'

This case study was originally published as part of the 'What Works Well' section of the National Strategies for Education in England. The National Strategies were professional programmes aiming for improvements in the quality of learning and teaching in schools in England. 'What Works Well' involved teaching practitioners from all phases and areas of education sharing accounts of real developments which had improved learning and teaching, and made a difference to pupil progress. 'What Works Well' case studies were designed to support practice transfer and include sufficient detail and resources to enable others to implement the effective practice described. They were reviewed by experts prior to publication as 'User Generated Content' (UGC) under a licence which encouraged reuse and derivative works, but which precluded commercial use.

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