What are the benefits for teaching and learning of cross-curricular work using thinking skills, techniques and language?

Aims of the project

There were three interlinked aims in this project.

- Firstly, to make thinking skills more explicit in teaching and learning.
- Secondly, to explore if students could adapt their use of thinking skills to different learning contexts and break down subject barriers.
- Finally, to assess how effectively students completed this work collaboratively.

Dimensions of the study

This enquiry was conducted at the Anglo European School, Essex. It is a successful mixed comprehensive with a strong European and international dimension. The school has 1,300 students on roll who come from both the local catchment area, and much further afield. The study included the whole of Year 7, and involved eight teachers from various disciplines, the head of Key Stage 3 and the year leader.

This pilot focused upon working with Year 7 in two separate halves, in two morning sessions in the main hall (the Mega-days). The students worked through four tasks in a carousel fashion. The aim was that students addressed the same thinking skill ('sorting and classifying') in several subjects. The eight teachers covered a range of subjects: maths; history; religious studies; citizenship; art and geography. Each teacher worked with a pre-selected group of six from their own timetabled class. This small group comprised a range of students at different levels of attainment (determined by the head of Key Stage 3 and Year 7 using CAT scores) which was loosely grouped into three: high, mid and low attainment. The total sample group was 48 students.

Summary of main findings

- There was an improvement in the quality of numerous areas of pupil learning, including: questioning, self and group reflection, sharing of ideas, consensus and awareness of task requirements.
- Some students (from across the attainment range) became increasingly aware of the 'thinking skills' they were using. A minority became confident at transferring their use into different contexts.
- There was a general rise in confidence amongst the students in tackling tasks, making suggestions and criticising assumptions.
- Teachers also noted that effective collaboration was more apparent when students had time dedicated to thinking skills i.e. on the Mega-day itself. During the post-task there was less collaboration, and a reverting to 'type'.

Background and context

A growing number of staff had displayed an interest in heightening the profile of thinking skills within the school, and although there were many examples of excellent practice, teachers were not fully aware of each other's strategies, techniques and resource development regarding the delivery of thinking skills. Furthermore, staff did not benefit from the good work that was also occurring around the school in other subjects. Prior to this, staff had not met to discuss working together to improve thinking skills. The teachers involved were keen to explore the opportunities for deploying thinking skills in a cross-curricular fashion in order to break down perceived learning barriers between subjects.

Teaching processes and strategies

The enquiry involved three stages: a pre-task; the pilot day itself (the Mega-day); and a post-task. This allowed us to measure where all the students were beginning from, how they experienced the Mega-day, and what impact, if any, this day had on their future practice. Before the pilot day, teachers involved in the project conducted a pre-event lesson with their class where they introduced an odd-one-out task that required the students to use the 'sorting and classifying' thinking skill.

We conducted this task in order to assess how effectively the pupils used the sorting and classifying thinking skill without intervention or prompting by the teacher. We wanted to observe the language they used; how far, and in what ways, they collaborated together; and if there were any differences between students of differing attainments. This information would then inform the nature of

the Mega-day tasks. Each teacher had a crib sheet for assessing pupils' existing awareness of thinking skills and the 'language of learning' that they used. All staff used the same crib sheet in order to standardise and coordinate their findings. The following is an excerpt:

Thinking skills language. Pupils used language like:					
Comprehending What is the problem about?	H M L	eg.	Making connections I remember doing something like this before!	H M L	eg.

As an introduction on the morning of the Mega-day, the students were informed about the aims and structure of the morning. They had one example modelled to them by two teachers, in order to let them know what was expected of them, and show them the type of approach and methodology that would be most helpful to them.

The pupils were also introduced to the 'language of learning' that they were encouraged to use in their tasks. This consisted of meta-cognitive vocabulary and phrases printed in their log books. Suggestions included:

- This was difficult to place because…
- This is easy to classify because…
- These are linked because…
- X is more important than y because…

They were told to document their ideas and answers as they progressed through the tasks using time allocated at the end of each task. The log book was specifically designed with meta-cognitive questions that were used to frame the findings of the enquiry. The following is an excerpt:

TASK 1

PAGE FOR REFLECTION

- What was the main problem that you had to solve?
- What skills do you think you used in this task? Tick as many as you want.

Looked for what made something stand out		Made decisions	
Justified decisions		Convinced/persuaded others	
Thought about more than one possibility		Challenged the ideas of others	
Listened to others		Applied ideas you've learnt from lessons	

Each teacher stayed with their group, undertook the tasks alongside the students and discussed problems and solutions as they progressed. The students appeared to like the teachers being on their level and attempting the tasks too. The tasks all focused upon the 'sorting and classifying' thinking skill, but each one was in a different subject. Each teacher observed their group and noted developments related to their cooperation, speech and reasoning. Each staff member had the same crib sheet as the pre-lesson, and on this they noted significant findings. The other groups with teachers not involved in the pilot participated in exactly the same way, but were not assessed.

The week after the Mega-day, the teachers conducted a post task with pupils that extended the sorting and classifying thinking skill but in a classroom and subject specific environment. They recorded data in the post-task, using the same crib-sheet, in order to assess if the students had progressed in their ability to use thinking skills and the 'language of learning'.

The findings

The findings were revealing: some we anticipated and some were quite surprising. Each staff member completed a series of logs on how their sample group completed their tasks, and using these as evidence completed a final feedback sheet with the following as guide questions:

1. What changed throughout the pre-task, the Mega-day tasks, and the post-tasks?
2. Did the pupils work differently in the classroom to the way they worked during the Mega-day? Can you account for this?
3. Did you notice any differences in the way the pupils of differing abilities responded to the tasks?

The teachers' feedback suggested:

- Generally, the students collaborated effectively and this improved, the more tasks they had completed. A proportion of lower-attaining students found the approach empowering and confidence building. However, some lower-attaining students believed they were collaborating when they actually weren't. They believed they were interacting with their peers, when the teacher had clearly observed them remaining quiet and isolated.
- Some middle-attaining students grew the confidence to question the assumptions of other more dominant characters, and sometimes assume leadership responsibilities.

- The activities encouraged the higher-attaining students to take account of the opinions of others, and to develop their negotiating skills.

- Across the whole sample group there was a noticeable decrease in collaboration in the post-task.

- Students used the 'language of learning' during the main task, but did not really take it forward into the post-task.

- Some students (from across the attainment range) were aware that 'thinking skills' could be transferred into different contexts and subject environments.

In their reflective write-up time, the students were asked: 'If you had to explain to someone what you did this morning, what would you say?'

We asked this question to find out the students' views on what they had been doing, and what they thought about it. One student identified the transferability of the thinking skill when she observed: "we could use the same skill in a lesson…and use it on our own". They also demonstrated an awareness of the collaborative nature of the tasks: "We collaborated and cooperated in groups on tasks used to expand our thinking skills…we justified our decisions… we then evaluated them coming to a final decision"; and also understood the importance of explaining their reasoning: "We had to justify things". Finally, the 'cognitive conflict' implicit in the tasks was not missed by some who appeared to thrive on it: "No answer was right or wrong…all it took was time to listen to each other and choose a suitable answer". Overall, the majority of feedback suggested that they found the whole undertaking enjoyable: "I'd say we were having lots of teamwork debates. I had fun and I was very happy on how our group worked well together".

Research methods

We identified various sources for data collection, including:

- the student log books;

- staff assessment sheets;

- anecdotal feedback;

- staff observations; and meta-cognitive plenary questions.

We used the plenary questions to help students reflect on what they had been doing, and where they might use the skills they had learnt.

Conclusion

This project has left many participating staff excited at the possibility of developing its key initiatives further. Within the limitations of a case study like ours, teachers have witnessed first-hand the benefits of taxing thinking skills through cross-curricular collaboration, and the extent to which this aids the transferability of knowledge and skills by students. We found that for some, the thinking skills activities helped learning by providing them with a focus for collaboration; although it is worth noting that, for a small minority, their understanding of 'collaboration' was not always accurate.

Teachers were also agreed that the students' reasoning skills improved as the tasks progressed on the Mega-day itself, although this did not seem to be effectively carried forward into the post-task activity. This suggests that the greatest benefits were experienced when there was dedicated time to 'thinking skills', when it is given discrete curriculum time, and undertaken in an explicitly collaborative setting. This enquiry has opened many possibilities to develop our thinking skills practice further – most particularly in the ongoing design and modification of the new Key Stage 3 curriculum; cross-fertilisation and closer collaboration between departments has been identified as a potential vehicle for this. Coupled with this, the integration of thinking skills into the Year 7 induction book and tutor period have been identified as areas for development. We are also disseminating our findings to the rest of the staff in a regular CPD newsletter and on in-house training days to continue raising the profile of thinking skills.

This project has provided evidence that cross-curricular work using thinking skills benefits students of all attainment levels, and in different ways. The approach has encouraged students to see how thinking skills, like sorting and classifying, can enable them to approach a topic from a different angle. It also seems to help them see the transferability of such skills across their learning in a range of subjects. This could lead to a greater awareness of themselves as learners, and how they learn. Ultimately, the students were engaged and totally focused on the tasks at hand on the day itself. Students left the sessions buoyant and visibly tired by their exertions – a positive sign that much hard work had been undertaken.

Further reading

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